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SQL*Plus User's Guide and Reference, Release 10.2

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Preface

The SQL*Plus (pronounced "sequel plus") User's Guide and Reference introduces SQL*Plus and its uses, and provides a description of each SQL*Plus command.

Unless explicitly stated otherwise, SQL*Plus refers to SQL*Plus behavior available through all its user interfaces: command-line, Windows Graphical User Interface and the *iSQL*Plus* web-based user interface.

This preface contains these topics:

- [Audience](#)
- [Documentation Accessibility](#)
- [Related Documents](#)
- [Conventions](#)

Audience

The *SQL*Plus User's Guide and Reference* is intended for business and technical users and system administrators who perform the following tasks:

- Develop and run batch scripts
- Format, calculate on, store, print and create web output from query results
- Examine table and object definitions
- Perform database administration

This document assumes a basic understanding of the SQL language. If you do not have familiarity with SQL, see the *Oracle Database SQL Reference*. If you plan to use PL/SQL in conjunction with SQL*Plus, see the *Oracle Database PL/SQL User's Guide and Reference*.

Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Accessibility standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For more information, visit the Oracle Accessibility Program Web site at

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Related Documents

For more information, see these Oracle resources:

- *SQL*Plus Quick Reference*
- *Oracle Database PL/SQL User's Guide and Reference*
- *Oracle Database SQL Reference*
- *Oracle Call Interface Programmer's Guide*
- *Oracle Database Concepts*
- *Oracle Database Administrator's Guide*
- *Oracle Database Backup and Recovery Basics*
- *Oracle Database Application Developer's Guide - Fundamentals*
- *Oracle XML DB Developer's Guide*
- *Oracle Database Globalization Support Guide*
- *Oracle Database Heterogeneous Connectivity Administrator's Guide*
- *Oracle Database Error Messages*
- *Oracle Database Upgrade Guide*
- *Oracle Database Reference*
- *Oracle Database Performance Tuning Guide*
- *Oracle Database Net Services Administrator's Guide*
- *Pro*COBOL Programmer's Guide*
- *Pro*C/C++ Programmer's Guide*
- Oracle Database installation and user's manuals for your operating system

Many of the examples in this book use the sample schemas, which are installed by default when you select the Basic Installation option with an Oracle Database installation. See *Oracle Database Sample Schemas* for information on how these schemas were created and how you can use them yourself.

SQL*Plus error message documentation is available in [Chapter 13, "SQL*Plus Error Messages"](#). Oracle Database error message documentation is only available in HTML. If you only have access to the Oracle Database Documentation media, you can browse the Oracle Database error messages by range. Once you find the specific range, use your browser's "find in page" feature to locate the specific message. When connected to the Internet, you can search for a specific error message using the error message search feature of the Oracle Database online documentation.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

What's New in SQL*Plus?

This section describes new features of the SQL*Plus Release 10.2 and provides pointers to additional information.

New Features in SQL*Plus Release 10.2

SQL*Plus Release 10.2 is a superset of SQL*Plus 10.1. This section describes new features introduced in SQL*Plus Release 10.2.

- SQL*Plus Supports Lightweight Instant Client

The SQL*Plus Instant Client now supports Lightweight Instant client and documentation is included in the *SQL*Plus User's Guide and Reference*.

See Also:

[Starting SQL*Plus Instant Client](#) on page xxv

[Appendix E, "SQL*Plus Instant Client"](#) on page E-1

- AUTOTRACE PLAN Output

Autotrace Plan output now includes additional information and uses the DBMS_XPLAN package format.

See Also: [Execution Plan](#) on page 8-2

- SET SERVEROUTPUT Changes

SET SERVEROUTPUT supports an UNLIMITED size which is the new default.

DBMS_OUTPUT line length limit is increased to 32767 bytes from 255.

You can SET ARRAYSIZE to tune the performance of SET SERVEROUTPUT.

See Also: [SET SERVEROUT\[PUT\] {ON | OFF} \[SIZE {n | UNL\[IMITED\]}\] \[FOR\[MAT\] {WRA\[PPED\] | WOR\[D_W\]RAPPED} | TRU\[NCATED\]}}](#) on page 12-132

Oracle Database PL/SQL Packages and Types Reference

- XQUERY Command

XQUERY is a new SQL*Plus command that enables you to run XQueries against your database in SQL*Plus or iSQL*Plus. There are four new SETXQUERY options associated with this command, SET XQUERY BASEURI, ORDERING, NODE, and CONTEXT.

See Also:

[XQUERY](#) on page 12-189

[SET XQUERY BASEURI {text}](#) on page 12-155

[SET XQUERY ORDERING {UNORDERED | ORDERED | DEFAULT}](#) on page 12-156

[SET XQUERY NODE {BYVALUE | BYREFERENCE | DEFAULT}](#)
on page 12-157

[SET XQUERY CONTEXT {text}](#) on page 12-158

SQL*Plus Quick Start

These instructions are to enable you to login and connect to a database after you have installed SQL*Plus. You can connect to the default database you created during installation, or to another existing Oracle database.

- [SQL*Plus Resources](#)
- [SQL*Plus Overview](#)
- [SQL*Plus Prerequisites](#)
- [Starting SQL*Plus Command-line](#)
- [Starting SQL*Plus Windows GUI](#)
- [Starting iSQL*Plus](#)
- [Starting SQL*Plus Instant Client](#)
- [Connecting to a Different Database](#)
- [Sample Schemas and SQL*Plus](#)
- [Running your first Query](#)
- [Exiting SQL*Plus](#)

SQL*Plus Resources

- SQL*Plus on the Oracle Technology Network at http://www.oracle.com/technology/tech/sql_plus/.
- SQL*Plus Discussion Forum at <http://www.oracle.com/forums/>.
- Oracle Documentation Library at <http://www.oracle.com/technology/documentation>.
- SQL*Plus Product and Documentation feedback by emailing sqlplus@oracle.com.

SQL*Plus Overview

SQL*Plus is an interactive and batch query tool that is installed with every Oracle Database installation. It has a command-line user interface, a Windows Graphical User Interface (GUI) and the *iSQL*Plus* web-based user interface.

There is also the SQL*Plus Instant Client which is a stand-alone command-line interface available on platforms that support the OCI Instant Client. SQL*Plus Instant Client connects to any available Oracle database, but does not require its own Oracle

database installation. See the Oracle Call Interface Programmer's Guide for more information on the OCI Instant Client.

SQL*Plus has its own commands and environment, and it provides access to the Oracle Database. It enables you to enter and execute SQL, PL/SQL, SQL*Plus and operating system commands to perform the following:

- Format, perform calculations on, store, and print from query results
- Examine table and object definitions
- Develop and run batch scripts
- Perform database administration

You can use SQL*Plus to generate reports interactively, to generate reports as batch processes, and to output the results to text file, to screen, or to HTML file for browsing on the Internet. You can generate reports dynamically using the HTML output facility of SQL*Plus, or using the dynamic reporting capability of *iSQL*Plus* to run a script from a web page.

Connections to an Oracle7 database from SQL*Plus 10.2 are not supported.

Who Can Use SQL*Plus

The SQL*Plus, SQL, and PL/SQL command languages are powerful enough to serve the needs of users with some database experience, yet straightforward enough for new users who are just learning to work with the Oracle Database.

The SQL*Plus language is easy to use. For example, to rename a column labelled LAST_NAME with the heading "Family Name", enter the command:

```
COLUMN LAST_NAME HEADING 'Family Name'
```

Similarly, to list column definitions for the EMPLOYEES table, enter the command:

```
DESCRIBE EMPLOYEES
```

How Can I Learn SQL*Plus

There are several sources available to assist you to learn SQL*Plus:

- Part II of this Guide, [Using SQL*Plus](#)
- Help for SQL*Plus, Command-line and *iSQL*Plus* online help
- Oracle Database 10g: SQL Fundamentals
 - An instructor-led course run by Oracle. This is a comprehensive hands-on course taking the student through all aspects of using SQL*Plus and *iSQL*Plus* to access Oracle Database.
- More Oracle Database 10g Training
 - To find more useful Oracle courses, go to <http://www.oracle.com/education>.

How to Use the SQL*Plus Guide

This guide provides information about SQL*Plus that applies to all operating systems. It also includes some Windows and UNIX specific information, for example, the Windows Graphical User Interface. Some aspects of SQL*Plus differ on each operating system. Such operating system specific details are covered in the Oracle Database Installation Guide provided for your system. Use these operating system specific guides in conjunction with this *SQL*Plus User's Guide and Reference*.

Throughout this guide, examples showing how to enter commands use a common command syntax and a common set of sample tables. The tables are described in "Sample Schemas and SQL*Plus" on page xxv.

SQL*Plus Command-line and Windows GUI Architecture

SQL*Plus command-line and the Windows GUI use a two-tier model comprising:

- Client (command-line user interface).
- Database (Oracle Database).

The two tiers may be on the same machine.

SQL*Plus Client

The command-line user interface is the character based terminal implementation. The Windows GUI is an alternate user interface available in Windows installations.

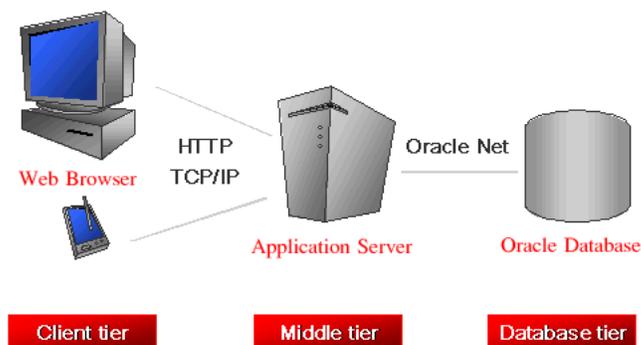
Oracle Database

Oracle Database Net components provide communication between the SQL*Plus Client and Oracle Database.

iSQL*Plus Architecture

iSQL*Plus is a browser-based interface which uses the SQL*Plus processing engine in a three-tier model comprising:

- Client (Web browser).
- Middle tier (Application Server).
- Database (Oracle Database).



The iSQL*Plus Server is installed on the same machine as the Application Server. The client may or may not also be on this machine. The middle tier coordinates interactions and resources between the client tier and the database tier. The database is Oracle8i, Oracle9i or Oracle Database 10g accessed through Oracle Net.

Web Browser

The iSQL*Plus user interface comprises web pages served to your web browser through the Internet or your intranet. There is no installation or configuration required for the iSQL*Plus user interface. You only need to know the URL of the Application Server to access an available Oracle database.

Application Server

The Application Server is installed when Oracle Database is installed.

The middle tier contains a Java2 Enterprise Edition (J2EE) compliant application server. It uses Oracle Containers for Java (OC4J) as the server engine. The Application Server enables communication and authentication between the *iSQL*Plus* user interface and Oracle Database.

Oracle Database

Oracle Net components provide communication between the *iSQL*Plus* Application Server and Oracle Database in the same way as for a client server installation of Oracle Database.

SQL*Plus Prerequisites

SQL*Plus is a component of Oracle Database. SQL*Plus, and its command-line user interface, Windows GUI, and *iSQL*Plus* web-based user interface are installed by default when you install the Oracle Database.

Some aspects of Oracle Database and SQL*Plus differ from one computer and operating system to another. These topics are discussed in the Oracle Database Installation Guide for each operating system that SQL*Plus supports.

What is necessary before you can run SQL*Plus or *iSQL*Plus*?

- Install Oracle Database (or Oracle Client for the command-line SQL*Plus or Windows GUI interfaces only). See the Oracle Database Installation Guide for your operating system available at <http://www.oracle.com/technology/documentation/>.
- Obtain an Oracle Database login username and password during installation or from your Database Administrator. See [Login Username and Password](#).
- Ensure a sample database is installed and that you have a login username and password for it during Oracle Database installation. See [Sample Schemas and SQL*Plus](#).
- Create a default database during installation or obtain the connection identifier for the Oracle Database you want to connect to from your Database Administrator. See [Connecting to a Database](#).
- Ensure the database you want to connect to is started. See the [STARTUP](#) command.
- If using *iSQL*Plus*, ensure that you have the URL for the Application Server you want to connect to, and that the Application Server is available and running. See [Starting the iSQL*Plus Application Server](#), and [Testing if the iSQL*Plus Application Server is Running](#).

SQL*Plus Date Format

The default date format in SQL*Plus is determined by the database NLS_DATE_FORMAT parameter and may use a date format displaying two digit years. You can use the SQL TO_CHAR function, or the SQL*Plus COLUMN FORMAT command in your SELECT statements to control the way dates are displayed in your report.

Starting SQL*Plus Command-line

The SQL*Plus executable is usually installed in \$ORACLE_HOME/bin, which is usually included in your operating system PATH environment variable. You may need to change directory to the \$ORACLE_HOME/bin directory to start SQL*Plus.

In the following examples, you are prompted to enter the database account password.

An example using an Easy Connection identifier to connect to the HR schema in the MYDB database running on mymachine is:

```
sqlplus hr@//mymachine.mydomain:port/MYDB
```

An example using a Net Service Name is:

```
sqlplus hr@MYDB
```

Net Service Names can be stored in a number of places, including Oracle Names. See the Net Services Reference Guide for more information.

If you want to use Net Service Names configured in a local Oracle Net tnsnames.ora file, then set the environment variable TNS_ADMIN to the directory containing the tnsnames.ora file. For example, on UNIX, if your tnsnames.ora file is in /home/user1 and it defines the Net Service Name MYDB2:

```
TNS_ADMIN=/home/user1
export TNS_ADMIN
sqlplus hr@MYDB2
```

This example assumes the ORACLE_HOME environment variable is set, and the \$ORACLE_HOME/network/admin/tnsnames.ora or %ORACLE_HOME%\network\admin\tnsnames.ora file defines the Net Service Name MYDB3:

```
sqlplus hr@MYDB3
```

The TWO_TASK (on UNIX) or LOCAL (on Windows) environment variable can be set to a connection identifier. This removes the need to explicitly enter the connection identifier whenever a connection is made in SQL*Plus or SQL*Plus Instant Client. This UNIX example connects to the database known as MYDB4:

```
TNS_ADMIN=/home/user1
export TNS_ADMIN
TWO_TASK=MYDB4
export TWO_TASK
sqlplus hr
```

To start SQL*Plus and connect to the default database

1. Open a UNIX or a Windows terminal and enter the SQL*Plus command:

```
sqlplus
```

2. When prompted, enter your Oracle Database username and password. If you do not know your Oracle Database username and password, ask your Database Administrator.

3. Alternatively, enter the SQL*Plus command in the form:

```
sqlplus username
```

You are prompted to enter your password.

4. SQL*Plus starts and connects to the default database.

Now you can start entering and executing SQL, PL/SQL and SQL*Plus statements and commands at the SQL> prompt.

To start SQL*Plus and connect to a database other than the default

Open a UNIX or a Windows terminal and enter the SQL*Plus command:

```
sqlplus username@connect_identifier
```

You are prompted to enter your password.

Starting SQL*Plus Windows GUI

To start the SQL*Plus Windows GUI and connect to a database

1. Click **Start > Programs > Oracle-OraHomeName > Application Development > SQL Plus**.

2. Alternatively, open a Windows terminal and enter the SQL*Plus command:

```
sqlplusw
```

3. The SQL*Plus Windows GUI opens and the Log On dialog is displayed.

Enter your Oracle Database username and password in the Log On dialog. If you do not know your Oracle Database username and password, ask your Database Administrator.

Leave the Host String field blank to connect to the default database. Enter a connection identifier for the database you want to connect to in the Host String field. You can connect to Oracle8i, Oracle9i and Oracle Database 10g databases.

4. Click OK. SQL*Plus starts and connects to the database.

Now you can start entering and executing SQL, PL/SQL and SQL*Plus statements and commands at the SQL> prompt.

Starting iSQL*Plus

To start an iSQL*Plus session

1. Enter the iSQL*Plus URL in your web browser's Location or Address field. The iSQL*Plus URL looks like:

```
http://machine_name.domain:port/isqlplus
```

If you do not know the iSQL*Plus URL, ask your System Administrator, or try one of the following on the machine running the iSQL*Plus Application Server.

```
http://127.0.0.1:5560/isqlplus/
```

```
http://localhost:5560/isqlplus/
```

iSQL*Plus uses HTTP port 5560 by default. If iSQL*Plus is not available on port 5560, read the \$ORACLE_HOME/install/portlist.ini file on the computer running the iSQL*Plus Application Server to find the port on which iSQL*Plus is running.

2. Press Enter to go to the URL. The iSQL*Plus Login screen is displayed in your web browser.
3. Enter your Oracle Database username and password in the Username and Password fields. If you do not know your Oracle Database username and password, ask your Database Administrator.
4. Leave the Connection Identifier field blank to connect to the default database.

Enter an Oracle Database connection identifier in the Connection Identifier field to connect to a database other than the default. You can connect to Oracle8i, Oracle9i and Oracle Database 10g databases.

If restricted database access has been configured, the Connection Identifier field is a dropdown list of available databases to select.

5. Click Login to connect to the database. The *iSQL*Plus* Workspace is displayed in your web browser.

Now you can start entering and executing SQL, PL/SQL and SQL*Plus statements and commands in the Workspace.

Starting and Stopping the *iSQL*Plus* Application Server

The *iSQL*Plus* Application Server is started during Oracle Database installation. It must be running to enable web-based *iSQL*Plus* sessions. See [Starting the *iSQL*Plus* Application Server](#) on page 3-8.

Starting SQL*Plus Instant Client

SQL*Plus Instant Client is the SQL*Plus command-line without the need to install Oracle Database. For information about using it, see [Starting SQL*Plus Command-line](#) on page xxii.

Because SQL*Plus Instant Client does not include a database, it is always 'remote' from any database server. To connect to a database you must specify the database using an Oracle Net connection identifier.

If TNS_ADMIN is not set, then an operating system dependent set of directories is examined to find tnsnames.ora. This search path includes looking in the directory specified by the ORACLE_HOME environment variable for network/admin/tnsnames.ora. This is the only reason to set the ORACLE_HOME environment variable for SQL*Plus Instant Client. If ORACLE_HOME is set when running Instant Client applications, it must be set to a directory that exists.

Connecting to a Different Database

To connect to a different database from a current command-line session

From an existing Windows GUI or command-line session, enter a CONNECT command in the form:

```
SQL> connect username@connect_identifier
```

You are prompted to enter your password.

To connect to a different database from a current *iSQL*Plus* session

From an existing *iSQL*Plus* session, enter a CONNECT command in the form:

```
SQL> connect username@connect_identifier
```

You are prompted to enter your password.

Sample Schemas and SQL*Plus

Sample schemas are included with the Oracle Database. Examples in this guide use the EMP_DETAILS_VIEW view of the Human Resources (HR) sample schema. This

schema contains personnel records for a fictitious company. To view column details for the view, EMP_DETAILS_VIEW, enter

```
DESCRIBE EMP_DETAILS_VIEW
```

For more information about the sample schemas, see the *Oracle Database Sample Schemas* guide.

Unlocking the Sample Tables

The Human Resources (HR) Sample Schema is installed as part of the default Oracle Database installation. The HR account is locked by default.

You need to unlock the HR account before you can use the HR sample schema. To unlock the HR account, log in as the SYSTEM user and enter the following command, where *your_password* is the password you want to define for the user HR:

```
ALTER USER HR IDENTIFIED BY your_password ACCOUNT UNLOCK;
```

For further information about unlocking the HR account, see the *Oracle Database Sample Schemas* guide. The HR user is primarily to enable you to access the HR sample schema and is necessary to enable you to run the examples in this guide.

Each table in the database is "owned" by a particular user. You may wish to have your own copies of the sample tables to use as you try the examples in this guide. To get your own copies of the HR tables, see your DBA or see the *Oracle Database Sample Schemas* guide, or you can create the HR tables with the script HR_MAIN.SQL which is located in the following directory on UNIX:

```
%ORACLE_HOME%/demo/schema/human_resources/hr_main.sql
```

And on the following directory on Windows:

```
%ORACLE_HOME%\DEMO\SCHEMA\HUMAN_RESOURCES\HR_MAIN.SQL
```

To create the HR tables from command-line SQL*Plus, do the following:

1. Ask your DBA for your Oracle Database account username and password.
2. Login to SQL*Plus.
3. On UNIX, enter the following command at the SQL*Plus prompt:

```
SQL> @?/DEMO/SCHEMA/HUMAN_RESOURCES/HR_MAIN.SQL
```

On Windows, enter the following command at the SQL*Plus prompt:

```
SQL> @?\DEMO\SCHEMA\HUMAN_RESOURCES\HR_MAIN.SQL
```

To remove the sample tables, perform the same steps but substitute HR_DROP.SQL for HR_MAIN.SQL.

Running your first Query

To describe a database object using *i*SQL*Plus, for example, column details for EMP_DETAILS_VIEW, enter a DESCRIBE command like:

```
DESCRIBE EMP_DETAILS_VIEW
```

which produces the following output:

Name	Null?	Type
EMPLOYEE_ID	NOT NULL	NUMBER(6)
JOB_ID	NOT NULL	VARCHAR2(10)
MANAGER_ID		NUMBER(6)
DEPARTMENT_ID		NUMBER(4)
LOCATION_ID		NUMBER(4)
COUNTRY_ID		CHAR(2)
FIRST_NAME		VARCHAR2(20)
LAST_NAME	NOT NULL	VARCHAR2(25)
SALARY		NUMBER(8,2)
COMMISSION_PCT		NUMBER(2,2)
DEPARTMENT_NAME	NOT NULL	VARCHAR2(30)
JOB_TITLE	NOT NULL	VARCHAR2(35)
CITY	NOT NULL	VARCHAR2(30)
STATE_PROVINCE		VARCHAR2(25)
COUNTRY_NAME		VARCHAR2(40)
REGION_NAME		VARCHAR2(25)

To rename the column headings, and to select data from the HR sample schema view, EMP_DETAILS_VIEW, enter

```
COLUMN FIRST_NAME HEADING "First Name"
COLUMN LAST_NAME HEADING "Family Name"
SELECT FIRST_NAME, LAST_NAME
FROM EMP_DETAILS_VIEW
WHERE LAST_NAME LIKE 'K%';
```

which produces the following output:

First Name	Family Name
Payam	Kaufling
Steven	King
Neena	Kochhar
Alexander	Khoo
Janette	King
Sundita	Kumar

Exiting SQL*Plus

It is recommended that you always use the Logout icon to exit *iSQL*Plus* to free up system and server resources.

To exit SQL*Plus command-line, enter EXIT.

To exit the Windows GUI, enter EXIT or select Exit from the File menu.

In *iSQL*Plus*, the EXIT or QUIT command halts the script currently running, it does not terminate your session.

Part I

SQL*Plus Getting Started

Part 1 provides the information you need to get started with SQL*Plus. It describes the command-line and *i*SQL*Plus user interfaces, provides configuration information and information you need to log in and run SQL*Plus.

Part 1 contains the following chapters:

- [SQL*Plus User Interface](#)
- [Configuring SQL*Plus](#)
- [Starting SQL*Plus](#)

SQL*Plus User Interface

This chapter describes the SQL*Plus command-line user interface, the Windows Graphical User Interface (GUI), and the *i*SQL*Plus web-based user interface. It contains the following topics:

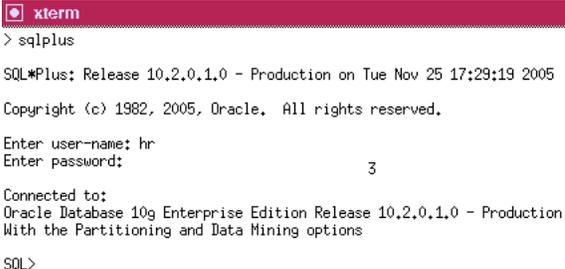
- [SQL*Plus Command-line User Interface](#)
- [Windows Graphical User Interface](#)
- [iSQL*Plus User Interface](#)
- [Preferences and Equivalent SET Commands](#)

SQL*Plus Command-line User Interface

The SQL*Plus command-line interface is standard on all operating systems.

The Command-line Screen

The following image shows the SQL*Plus command-line interface running in an X terminal.



```
xterm
> sqlplus

SQL*Plus: Release 10.2.0.1.0 - Production on Tue Nov 25 17:29:19 2005
Copyright (c) 1982, 2005, Oracle. All rights reserved.

Enter user-name: hr
Enter password: 3

Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production
With the Partitioning and Data Mining options

SQL>
```

When SQL*Plus starts, it displays the date and time, the SQL*Plus version and copyright information before the SQL*Plus prompt appears. The default prompt for SQL*Plus command-line is:

```
SQL>
```

Changing the Command-line Font and Font Size

In Windows, from a Command Prompt, open the Command Prompt Properties dialog to set the font and font size used in the SQL*Plus command-line interface.

To Change the Command-line Interface Font and Font Size

1. Right click in the command-line interface title bar.
2. Click Properties. The Window Preview box displays the current window's relative size on your monitor based on your font and font size selections. The Selected Font: box displays a sample of the current font.
3. Click the Font tab.
4. Select the font size to use from the Size box. Raster font sizes are shown as width by height in pixels. TrueType font sizes are shown as height in pixels.
5. Select the font to use from the Font box.
6. Select the Bold Fonts check box if you want to use a bold version of the font.

For more information about changing Command Prompt properties, see Windows Help or click Help in the Command Prompt Properties dialog.

Using a Special Character in Windows

To check if a font contains a particular character, for example, the Euro sign, enter the character's decimal number equivalent in the SQL*Plus command-line interface. For example, the decimal number equivalent for the Euro sign is 128, so you would enter Alt+0128 (hold Alt while pressing 0, 1, 2 and 8 in the numeric keypad) to display it. If it appears correctly, the font contains the Euro sign, otherwise you need to try another font.

You can use the Windows Character Map utility to view the characters available in a font. Character Map also shows the decimal number equivalent for extended ASCII characters. You access the Character Map utility by selecting Start, Programs, Accessories and then clicking Character Map.

Windows Graphical User Interface

The graphical user interface is a feature of SQL*Plus only available in Windows. The Windows Graphical User Interface will be obsoleted in favor of the *i*SQL*Plus browser-based user interface in a future release of SQL*Plus.

The graphical user interface does not support non-blocking database calls to the Oracle Database server. Therefore there is no cancel dialog while statements are executing.

The following image shows the SQL*Plus Windows Graphical User Interface (GUI) running in Windows.

```

Oracle SQL*Plus
File Edit Search Options Help
SQL*PLUS: Release 10.2.0.1.0 - Production on Mon Oct 3 17:37:16 2005
Copyright (c) 1982, 2005, Oracle Corporation. All rights reserved.
Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production
With the Partitioning and Data Mining options
SQL>

```

When the Windows GUI starts, it displays the same information as the command-line user interface, and has the same default prompt:

```
SQL>
```

Using the Mouse to Copy Text to the Command Prompt

You can use the mouse to copy text from anywhere in the Windows GUI to the SQL*Plus prompt.

Left click and drag to select the text you want to copy. While still holding down the left button, right click to copy the selected text to the SQL*Plus prompt.

You can also use Ctrl-C and Ctrl-V to cut and copy text.

Using Command Keys

The following command keys have special functions in the Windows GUI:

Key	Function
Home	Top of screen buffer
End	Bottom of screen buffer
Page Up	Previous screen page
Page Down	Next screen page
Ctrl+Page Up	Show page on left of current screen page
Ctrl+Page Down	Show page on right of current screen page
Alt+F3	Find
F3	Find next
Ctrl+C	Cancel the data fetch operation following command execution.
Ctrl+C	Copies text - when no operations are running.
Ctrl+V	Paste text
Shift+Del	Clear the screen and the screen buffer

Using the Windows GUI Menus

There are menus in the SQL*Plus Windows GUI menu bar. In the Option column, entries in parentheses show keyboard shortcuts. The Command-line column shows equivalent command-line commands.

File Menu

The File menu has the following options:

Option	Description of File Menu Option	Command-line
Open	The Open option retrieves a previously stored script If you supply no file extension, SQL*Plus looks for scripts with the SQL extension The script should contain a single SQL or PL/SQL statement such as SELECT It should not contain multiple statements, and it should not contain SQL*Plus commands such as SET.	GET <i>filename</i>
Save	The Save option has three alternatives: Save Create, Save Replace, and Save Append	SAVE
	<ul style="list-style-type: none"> ▪ Save Create saves the contents of the SQL*Plus buffer in a script By default, SQL*Plus assigns the SQL extension to scripts You can specify a different extension in the File name text box. 	SAVE <i>filename</i> CREATE
	<ul style="list-style-type: none"> ▪ Save Replace replaces the contents of an existing file with the contents of the SQL*Plus buffer SQL*Plus creates the file if it does not exist. 	SAVE <i>filename</i> REPLACE
	<ul style="list-style-type: none"> ▪ Save Append adds the contents of the SQL*Plus buffer to the end of the file you specify. 	SAVE <i>filename</i> APPEND

Option	Description of File Menu Option	Command-line
	<p>After you save a script, you can:</p> <ul style="list-style-type: none"> Retrieve the file using the Open option on the File menu. Edit the file using the Editor option on the Edit menu. Run the file using the START or RUN commands from the SQL*Plus command prompt. 	
Save As	<p>The Save As option saves the contents of the SQL*Plus buffer in a script. By default, SQL*Plus assigns the SQL extension to scripts. You can specify a different extension in the File name text box.</p>	SAVE <i>filename</i> REPLACE
Spool	<p>The Spool option has two alternatives: Spool File and Spool Off. The Spool File option is the same as the SPOOL command with the REPLACE option. SQL*Plus for Windows does not support the SPOOL OUT option.</p> <ul style="list-style-type: none"> Spool File stores query results in a file. By default, SQL*Plus assigns the LST extension to spool files. You can specify a different extension in the File name text box. You can edit the results with the Editor option on the Edit menu, and print the file from a Windows text editor. Spool Off turns off spooling. 	SPOOL <i>filename</i> REP:ACE SPOOL OFF
Run	The Run option lists and executes the SQL command or PL/SQL block currently stored in the SQL buffer. Typically this will be the last statement that was executed.	RUN
Cancel (Ctrl+C)	<p>The Cancel option cancels an in-progress operation.</p> <p>The Cancel keyboard shortcut is only available when a SQL operation is running in the SQL*Plus session. When no SQL*Plus operation is running, Ctrl+C copies selected text.</p>	Ctrl+C
Exit	The Exit option commits all pending database changes and closes the SQL*Plus application window.	EXIT

Edit Menu

The Edit menu has the following options:

Option	Description of Edit Menu Option	Command-line
Copy (Ctrl+C)	<p>The Copy option copies selected text to the Clipboard.</p> <p>After you copy text to the Clipboard, you can paste the text into other Windows applications, such as Microsoft Excel and Microsoft Word.</p> <p>The Copy keyboard shortcut is only available when no SQL operations are running in the SQL*Plus session. When a SQL operation is running, Ctrl+C cancels the running operation.</p>	not applicable
Paste (Ctrl+V)	<p>The Paste option pastes the contents of the Clipboard to the SQL*Plus command-line.</p> <p>Note: A maximum of 3625 characters can be pasted from the Clipboard to the SQL*Plus command-line during a single paste operation.</p>	not applicable
Clear (Shift+Del)	The Clear option clears the screen buffer and the screen of the SQL*Plus application window.	CLEAR SCREEN
Editor	<p>The Editor option has two alternatives: Invoke Editor and Define Editor.</p> <ul style="list-style-type: none"> Invoke Editor loads the contents of the SQL*Plus buffer into an editor. By default, SQL*Plus saves the file to AFIEDT.BUF Define Editor defines the editor that is invoked 	EDIT DEFINE _EDITOR = <i>editor_name</i>

Search Menu

The Search menu has the following options:

Option	Description of Search Menu Option	Command-line
Find (Alt+F3)	The Find option searches for a character, a word, or a group of characters or words in the SQL*Plus application window. Find begins the search at the top of the displayed screen. Note: When Find reaches the end of the displayed screen, it does not wrap and continue searching from the top of the screen buffer.	not applicable
Find Next (F3)	The Find Next option finds the next occurrence of the search text.	not applicable

Options Menu

The Options menu has the following options:

Option	Description of Options Menu Option	Command-line
Environment	<p>The Environment option enables you to set system variables to alter the SQL*Plus environment for your current session. This dialog has three areas: Set Options, Value, and Screen Buffer.</p> <p>Note: See Setting Options and Values Using the Environment Dialog on page 2-21 for examples of how these controls interact.</p> <p>Set Options</p> <p>This area has a list of variables you can select to establish aspects of the SQL*Plus environment for your current session, such as:</p> <ul style="list-style-type: none"> Setting the display width for NUMBER data. Setting the display width for LONG data. Enabling or disabling the printing of column headings. Setting the number of lines in each page. <p>See the SET command on page 12-89 for descriptions of each system variable.</p>	SET <i>variable value</i>
	<p>Value</p> <p>The Value area has four options: Default, Custom, On, and Off.</p> <p>Note: When Custom is selected, the On and Off buttons and the text field may or may not be enabled for user selection. The availability of these fields depends on the item selected in the Set Option.</p>	SET <i>variable value</i>
	<p>Screen Buffer</p> <p>This area has two text boxes: Buffer Width and Buffer Length.</p> <ul style="list-style-type: none"> Use the Buffer Width text box to set the number of characters available to display on one line. The Buffer Width value must be at least as big as the LINESIZE value. Buffer Width has a default value of 100, a minimum value of 80, and a maximum value of 32,767 characters. In the Buffer Length text box, you set the number of lines that SQL*Plus displays on the screen. The default value of the Buffer Length parameter is 1000 lines. You can specify from 100 to 2000 lines on one screen. <p>Notes: When you change the Screen Buffer option, SQL*Plus displays a dialog to alert you that if you shorten the size of your screen buffer, some data may not be displayed on your screen. Click OK to proceed.</p> <p>If you use SET MARKUP to send output to an HTML table, the number of lines specified in the Buffer Length variable specifies the number of HTML table rows. Each HTML table row may contain more than one text line.</p>	not applicable

Help Menu

The Help menu has the following option:

Option	Description of Help Menu Option	Command-line
About SQL*Plus	Displays the SQL*Plus version number and copyright information. You access SQL*Plus help from the SQL*Plus prompt. See Getting Command-line Help on page 3-7.	not applicable

Changing the Windows GUI Font and Font Size

There are two registry entries that set the font and font size used in the SQL*Plus Windows GUI. SQLPLUS_FONT sets the font face, and SQLPLUS_FONT_SIZE sets the font size in pixels.

You use the Windows Registry Editor to create these two registry entries and define values for them. Ensure that you create the correct entries in uppercase, and that the values (font names, sizes) you enter are correct.

Warning: Microsoft does not recommend modifying the registry. Editing the registry may affect your operating system and software installation. Only advanced users should edit the registry. Oracle takes no responsibility for problems arising from editing the Windows registry.

You can choose any fixed-pitch TrueType font available in your Windows system such as Courier New or Lucida Console. If you choose a proportional pitch font such as Arial or Times New Roman, or if you enter an unavailable font, the registry entry is ignored and the default font and size, Fixedsys 16, are used. If you choose an unavailable font size, the default font size, 16, is used.

If you do not create the SQLPLUS_FONT registry entry, or if you do not specify a value for SQLPLUS_FONT, the default font and size, Fixedsys 16, are used.

If you want to use particular characters, such as the Euro sign, you should make sure that the fixed pitch font you choose contains those characters.

To Change the Windows GUI Font and Font Size

1. Select Run from the Start menu and then enter regedit in the Open field.
2. Click OK to start the Registry Editor. The Registry Editor is displayed.
3. Navigate to HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\HOME0.

Note: If you have more than one Oracle Database installation, you must select the HOME entry associated with the Windows GUI you want to change. HOME0 is the registry entry for an Oracle Database installation. A subsequent Oracle Database installation will have the registry entry HOME1 and the next HOME2 and so on.

Changes only affect a SQL*Plus Windows GUI started from the associated Oracle Database installation, so you can use different settings for each Oracle Database installation.

4. Click New String Value in the Edit menu. A new string value, with the default name, NewValue #1 is created at the bottom of the right pane of the Registry Editor. The default name of the new string value is selected ready for you to replace with the name you want.
5. Enter SQLPLUS_FONT as the name of the new font face string value. If you misskey the name or inadvertently enter it in mixed or lower case, you can edit the name by selecting Rename from the Edit menu.

or

Enter SQLPLUS_FONT_SIZE as the name of the new font size string value. If you misskey the name or inadvertently enter it in mixed or lower case, you can edit the name by selecting Rename from the Edit menu.

6. Click Modify from the Edit menu or press Enter again to display the Edit String dialog.
7. Enter the font name you want to use, such as Courier New, in the Value Data: field. SQL*Plus will use the new font the next time you start the SQL*Plus Windows GUI. The font must be a True Type fixed pitch font such as Courier New or Lucida Console.

or

Enter the font size you want to use in pixels, such as 14, in the Value Data: field. SQL*Plus will use the new font size the next time you start the SQL*Plus Windows GUI. The size must be a size that exists on the client machine for the specified font.

Note: You should not change the font face, font size or font subset while any SQL*Plus Windows GUI is active. You should exit all SQL*Plus Windows GUI sessions, make font face, font size and font subset changes in the registry, exit the Registry Editor and then restart the SQL*Plus Windows GUI to see the changes.

Using a Special Character

To check if a font contains a particular character such as the Euro sign, enter the character's decimal number equivalent in the SQL*Plus Windows GUI. For example, the decimal number equivalent for the Euro sign is 128, so you would enter Alt+0128 (hold Alt while pressing 0, 1, 2 and 8 on the numeric keypad) to display it. If it appears correctly, the font contains the Euro sign, otherwise you need to try another font.

You can also use the Windows Character Map accessory to view the characters available in a font. Character Map also shows the decimal number equivalent for extended ASCII characters. You access the Character Map accessory by selecting Start->Programs->Accessories->System Tools->Character Map.

iSQL*Plus User Interface

iSQL*Plus is a web-based user interface to an Oracle Database.

iSQL*Plus Navigation

There are a number of ways to navigate in iSQL*Plus:

Icons

Global navigation icons are displayed on each screen. Icons have two states:

- A white background when that functionality is available
- A blue background when active (when you have navigated to that screen)

Three navigation icons are always available after you have logged into *iSQL*Plus*:

Logout

Deletes your history list, ends your *iSQL*Plus* session, and displays the Login screen with a message confirming that you have logged out.

Preferences

Opens the Preferences screen where you can configure interface settings, system settings or change your password.

Help

Opens *iSQL*Plus* Help in a separate web browser window. Help is also available from the Login screen.

Tabs

Tabs appear on the top right of the current screen. Click a tab to go to that screen.

Menus

There are side menus to provide navigation to sections in screens such as Preferences. Click the link to go to that screen.

Footer Links

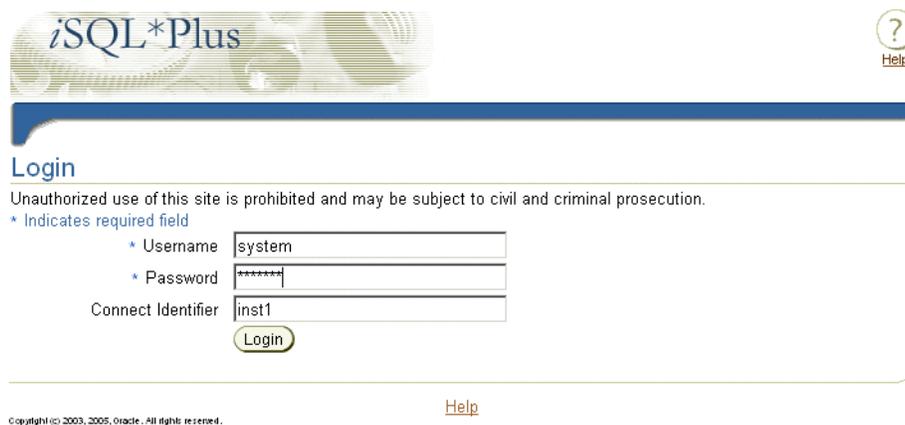
Footer links are navigation links to available screens shown at the bottom of each page. Click a link to go to that screen.

iSQL*Plus Login Screen

You connect to the Login screen from your web browser with a URL like:

`http://machine_name.domain:port/isqlplus`

The Login screen is displayed:



iSQL*Plus 
Help

Login

Unauthorized use of this site is prohibited and may be subject to civil and criminal prosecution.

* Indicates required field

* Username

* Password

Connect Identifier

[Help](#)

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Username:

Enter a valid username to connect to the Oracle Database (mandatory).

Password:

Enter a valid password for the username (mandatory).

Connection Identifier:

Leave this field blank to use the default Oracle database, otherwise enter a connection identifier for the database you want to connect to.

```
[//]host[:port][/]service_name]
```

The `SERVICE_NAME` is the global database name entered during database creation. It combines a database name with a domain name. For example, the `SERVICE_NAME` `sales.us.acme.com` has a database name of `sales` and a domain of `us.acme.com`.

An `INSTANCE_NAME` is the name you give to the database instance during creation. It defaults to the `SID` you entered during database creation.

An Oracle System Identifier (`SID`) identifies a specific Oracle release 8.0 or earlier database instance.

You can optionally use an `INSTANCE_NAME` in place of the `SERVICE_NAME`.

Use a `SID` in place of `SERVICE_NAME` when connecting to an Oracle release 8.0 database.

Alternatively you can use an Oracle Net alias. If you use an Oracle Net alias, it must be specified on the machine running the *iSQL*Plus* Server, which may not be the same machine from which you run your web browser.

*iSQL*Plus* can be configured to restrict connections to specific databases. If restricted database access has been enabled, a dropdown list of available databases is displayed in place of the Connection Identifier text field. This enables greater security for *iSQL*Plus* Servers in hosted environments. This is configured using the `iSQLPlusConnectIdList` parameter in the configuration file. See [Enabling Restricted Database Access](#) on page 2-12 for more information.

See the *Oracle Database Net Services Administrator's Guide* for more information about defining connection identifiers.

Login

Click the Login button to log in to *iSQL*Plus*. If you enter an invalid username or password, the Login screen is re-displayed with an error message.

iSQL*Plus DBA Login Screen

You can log in to *iSQL*Plus* with `SYSDBA` or `SYSOPER` privileges to perform database administration and run DBA commands through *iSQL*Plus*. You must authenticate with the Application Server, and have Oracle `SYSDBA` or `SYSOPER` privileges.

To connect with either `SYSDBA` or `SYSOPER` privileges, users must be created through the OC4J user manager. To add users for DBA Login, see [Enabling iSQL*Plus DBA Access](#) on page 2-13.

Because of possible HTTP network timeouts, it is recommended that you use command-line *SQL*Plus* for long running DBA operations.

To log in with SYSDBA or SYSOPER privileges, you must enter the iSQL*Plus DBA URL in the Location/ Address field of your web browser. The iSQL*Plus DBA URL is in the form:

`http://machine_name.domain:port/isqlplus/dba`

The Enter Network Dialog dialog is displayed. The name of the dialog may differ on different operating systems.



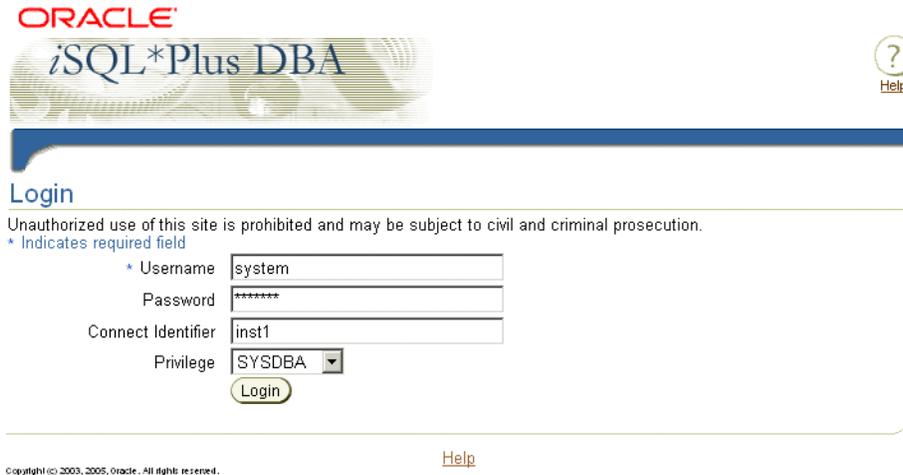
User Name

Enter a valid Application Server authentication username. This may not be the same as your Oracle Database username.

Password

Enter a valid Application Server authentication password for the username. This may not be the same as your Oracle Database password.

After you have successfully authenticated, the iSQL*Plus DBA Login screen is displayed:



Username:

Enter a valid username or / to connect to Oracle Database (mandatory).

Password:

Enter a valid password for the username.

Connection Identifier:

Leave this field blank to use the default Oracle database, otherwise enter a connection identifier for the database you want to connect to.

```
[//]host[:port][/service_name]
```

You can optionally use `INSTANCE_NAME` in place of `SERVICE_NAME`. When connecting to an Oracle release 8.0 or earlier database, you use a `SID`. Alternatively you can use an Oracle Net alias. If you use an Oracle Net alias, it must be specified on the machine running the *iSQL*Plus* Server, which may not be the same machine from which you run your web browser.

*iSQL*Plus* can be configured to restrict connections to specific databases. If restricted database access has been enabled, a dropdown list of available databases is displayed in place of the Connection Identifier text field. This enables greater security for *iSQL*Plus* Servers in hosted environments. This is configured using the `iSQLPlusConnectIdList` parameter in the configuration file. See [Enabling Restricted Database Access](#) on page 2-12 for more information.

Privilege:

The Privilege dropdown list has two options:

- `SYSDBA`—connects to the specified database with `SYSDBA` privileges.
- `SYSOPER`—connects to the specified database with `SYSOPER` privileges.

Login

Click the Login button to log in to *iSQL*Plus* with the supplied username, password, connection identifier and DBA privilege. If you enter an invalid username or password, you are returned to the Login screen and a message is displayed.

iSQL*Plus Workspace

The Workspace consists of the Workspace, History and Load Script screens. After successfully logging in, the Workspace is displayed. From the Workspace you can:

- Enter, Execute and Cancel scripts
- Load and Save scripts
- View, Save and Print output
- Access Preferences screens
- Get help and Log out



The Workspace and History screens display the user's connection information in the top right. The connection information is displayed in the form:

Connected as [username]@[connection_identifier] [AS SYSDBA | AS SYSOPER]

or

Not connected

Clear

Clears all statements in the Input area, and all displayed output. Cancels any script that may be running.

It does not clear the SQL buffer, nor does it clear any variable values altered by changing preferences or changing options of the SET command.

Execute

Executes the contents of the Input area. Depending on your preference settings, the results are displayed in the Output area, in a new web browser window, or saved to a file.

Load Script

Displays the Load Script screen where you enter a path and file name, or a URL for the script you want to load into the Input area for editing or execution.

Save Script

Displays the File > Save As dialog where you enter a file name for the script you want to save from the Input area as a plain text file. It may be useful to identify scripts with an extension of .SQL.

Cancel

Cancels any script that is currently running, but does not clear the Input or Output areas. A message saying that the script was cancelled is displayed.

Next Page

Displays the next page of report output. The Next Page button is displayed when there are more results to display than can fit on the current output page or the script contains a PAUSE command.

You can configure whether pages are displayed on a single page or multiple pages using Preferences > Interface Configuration > Output Page Setup, or by executing the SET PAUSE ON or SET PAUSE OFF command.

You can use the standard Back button of your web browser to view previous pages of iSQL*Plus output. Some web browsers do not support this use of the Back button.

iSQL*Plus DBA Workspace

If you log in with SYSDBA or SYSOPER privileges, the iSQL*Plus DBA Workspace is displayed to remind you of the privileged connection. It is otherwise identical to the iSQL*Plus Workspace described earlier.

Fill out the fields on the DBA Workspace as you would for the iSQL*Plus Workspace.

iSQL*Plus History Screen

Click the History tab to display the History screen. The History screen enables you to reload scripts that you have previously executed in the same session.

A history entry is created each time you execute a script in the Workspace if it is not the same as the most recently executed script. The History screen shows the first 80 characters of the script.

When the history limit is reached, the oldest scripts are removed. When you exit a session the history is discarded, and history is not shared between sessions.

You can change the default number of entries stored in the history list in the Interface Options screen which you access from the Preferences screen.

ORACLE[®]
iSQL*Plus

Logout Preferences Help

Workspace History

Connected as HR@ORCL

History

The scripts listed are for the current session. Script history is not available for previous sessions.

Select scripts and ...

Select All | Select None

Select Script

<input type="checkbox"/>	select employee_id, first_name, last_name from emp_details_view;
<input type="checkbox"/>	select employee_id, first_name, last_name from emp_details_view;
<input type="checkbox"/>	describe emp_details_view;
<input type="checkbox"/>	select * from emp_details_view;

Workspace | History | Logout | Preferences | Help

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Script

Shows the current list of scripts in the history. They are in most recently executed order, with the most recent at the top. Click the checkbox of one or more scripts that you want to load into the Input area.

Scripts are displayed verbatim, so be careful if you have included items like CONNECT commands which include passwords.

Load

Loads the selected scripts into the Input area of the Workspace.

Delete

Deletes the selected scripts from the history.

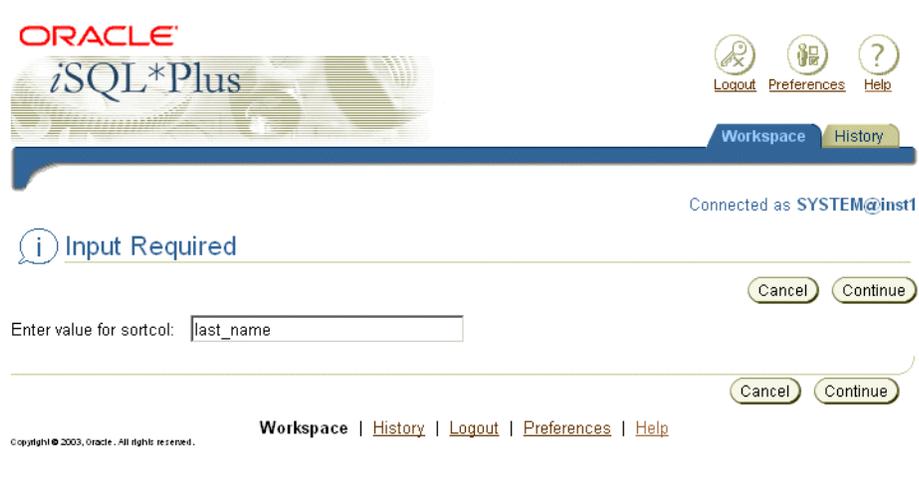
Click the Workspace tab to return to the Input area without loading or deleting any scripts from the history.

iSQL*Plus Input Required Screen

When iSQL*Plus executes a script containing substitution variables, the Input Required screen is displayed for each substitution variable. For example, enter:

```
BREAK ON &&SORTCOL
SELECT &SORTCOL, SALARY
FROM &MYTABLE
WHERE SALARY > 12000
ORDER BY &SORTCOL;
```

The Input Required screen is displayed.



Enter Value for sortcol

Enter a value for the sortcol variable. For example, enter LAST_NAME. Remember that if a substitution variable is currently undefined, then when it is referenced with a single ampersand, you are prompted for its value at every occurrence of the reference. If you reference the variable with a double ampersand, the value is retained for the session and you will only be prompted for it once.

When prompted, enter a value for the mytable variable. For example, enter EMP_DETAILS_VIEW.

Continue

Click the Continue button to execute the script in the Input area with the input values you entered.

Cancel

Click the Cancel button to cancel execution of the script and return to the Workspace.

iSQL*Plus Preferences Screen

The Preferences screen enables you to change interface settings, system settings, and your password. The Cancel and Apply buttons appear on each of the Preferences screens and have the same function on all Preferences screens. Click the Workspace or History tab to return to the Workspace or History screen.

Connection information is not displayed in the Preferences screen.

Cancel

Click the Cancel button to cancel changes you have made on this Preferences screen.

Apply

Click the Apply button to apply the changes you have made on this Preferences screen.

Interface Configuration

Click Interface Configuration in the side menu to open the Interface Configuration screen.

The screenshot shows the iSQL*Plus user interface. At the top, there is a header with the Oracle logo and 'iSQL*Plus' text. On the right side of the header, there are icons for Logout, Preferences, and Help. Below the header, there are tabs for 'Workspace' and 'History'. The main content area is titled 'Interface Configuration' and contains the following sections:

- Interface Configuration**: Configure settings that affect the iSQL*Plus user interface. (Buttons: Cancel, Apply)
- History Size**: Set the number of scripts displayed in the script history. Scripts:
- Input Area Size**: Set the size of the script input area. Width: Height:
- Output Location**: Set where script output is displayed.
 - Below Input Area
 - Save to HTML File
- Output Page Setup**: Set whether output is displayed on a single page, or over multiple pages.
 - Single page
 - Multiple pages
 Number of rows on each page:
 Text at each page break:

In the left sidebar, the 'Interface Configuration' menu item is selected, and other options include System Configuration (Script Formatting, Script Execution, Database Administration) and Change Password.

System Configuration

You can click one of the three entries under System Configuration in the side menu to open these further three screens:

- Script Formatting
- Script Execution
- Database Administration

Script Formatting

Click Script Formatting in the side menu to open the Script Formatting screen. You use the Script Formatting screen to set options that affect the way script output is displayed.

Each of these options contains either a field, set of radio buttons, or text area to change the setting, with explanatory text.

ORACLE
iSQL*Plus

Logout Preferences Help

Workspace History

- [Interface Configuration](#)
- System Configuration
 - **Script Formatting**
 - [Script Execution](#)
 - [Database Administration](#)
- [Change Password](#)

Script Formatting

Configure settings that affect how script output is formatted, and what optional information it contains. Cancel Apply

Describe Objects

Set the depth of the level to which you can recursively describe an object.

Describe all

Describe depth

Show Line Numbers

On
 Off

Indent Attribute or Column Names

On
 Off

Display Bind Variables

Set whether to automatically display bind variables referenced in PL/SQL blocks or EXECUTE commands.

On
 Off

Display Commands

Set whether commands in scripts are displayed in output as the script is executed.

On
 Off

Script Execution

Click Script Execution in the side menu to open the Script Execution screen. You use the Script Execution screen to set options which affect the way scripts are executed.

Each of these options contains either a field, set of radio buttons, or text area to change the setting, with explanatory text.

The screenshot shows the iSQL*Plus interface with the 'Script Execution' configuration page selected in the side menu. The page title is 'Script Execution' and it contains several sections for configuring script execution settings.

Script Execution
Configure settings that affect how scripts are parsed and executed. Cancel Apply

Array Size
Set the number of rows (batch) to fetch from the database at one time.
Rows

Check SQL Syntax
Set whether to check SQL statements for conformance to ANSI/ISO SQL92 standard.
 Entry
 Intermediate
 Full
 Off

Commit Changes
Set whether to automatically commit pending changes to the database.
 On
 Off
 Immediate
 Number of statements or blocks before commit

Commit When Copying
Set the number of batches after which a commit will be performed when copying data.
Number of batches

Database Administration

Click Database Administration in the side menu to open the Database Administration screen. You use the Database Administration screen to set options that affect database administration.

Each of these options contains either a field, set of radio buttons, or text area to change the setting, with explanatory text.

The screenshot shows the iSQL*Plus interface with the 'Database Administration' configuration page selected in the side menu. The page title is 'Database Administration' and it contains sections for configuring database administration settings.

Database Administration
Configure settings that affect database administration. Cancel Apply

Archive Log Source
Set the location from which archive logs are retrieved during recovery.
 Default
 Path

Automatic Recovery
Set whether to use the default filenames of archived redo log files during recovery.
 On
 Off

Cancel Apply

[Workspace](#) | [History](#) | [Logout](#) | [Preferences](#) | [Help](#)

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Change Password

Click Change Password in the side menu to access the Change Password screen. See [Changing Your Password in iSQL*Plus](#) on page 3-3.



Preferences and Equivalent SET Commands

The tables below show the preferences available on each of the four Preferences screens, and the equivalent system variables that can be set using the SET command.

Table 1–1 Interface Configuration

iSQL*Plus Preference	Equivalent SET Command
History Size	Not applicable
Input Area Size	Not applicable
Output Location	Not applicable
Output Page Setup	SET PAGESIZE, SET PAUSE

Table 1–2 Script Formatting

iSQL*Plus Preference	Equivalent SET Command
Describe Objects	SET DESCRIBE
Display Bind Variables	SET AUTOPRINT
Display Commands	SET ECHO
Display Headings	SET HEADING
Display Record Count	SET FEEDBACK
Display Server Output	SET SERVEROUTPUT
Display Substitution Variables	SET VERIFY
*HTML HEAD Tag	SET MARKUP HTML HEAD
*HTML BODY Tag	SET MARKUP HTML BODY
*HTML TABLE Tag	SET MARKUP HTML TABLE
Line Size	SET LINESIZE

Table 1–2 (Cont.) Script Formatting

iSQL*Plus Preference	Equivalent SET Command
*Map Special Characters to HTML Entities	SET MARKUP HTML ENTMAP
Null Text	SET NULL
Number Format	SET NUMFORMAT
Number Width	SET NUMWIDTH
Preformatted Output	SET MARKUP HTML PREFORMAT
Column Separator	SET COLSEP
Display Record Separator	SET RECSEP, SET RECSEPCHAR
Headings on Multiple Lines	SET HEADSEP
Underline Headings	SET UNDERLINE
Start Output	SET EMBEDDED
Timing Statistics	SET TIMING
Wrap Lines	SET WRAP

* Items prefixed with an asterisk are only available when the `iSQLPlusAllowUserMarkup` configuration option is set to ALL. Its default value is NONE. For more information, see [Enabling User Defined HTML Markup](#) on page 2-19.

Table 1–3 Script Execution

iSQL*Plus Preference	Equivalent SET Command
Array Size	SET ARRAYSIZE
Check SQL Syntax	SET FLAGGER
Commit Changes	SET AUTOCOMMIT
Commit when Copying	SET COPYCOMMIT
Compare Datatypes when Copying	SET COPYTYPECHECK
Escape Character	SET ESCAPE
LOB Offset	SET LOBOFFSET
LOB, LONG and XML Type Size	SET LONG
Multiple SQL*Plus Commands on Single Line	SET CMDSEP
Register Scripts	SET APPINFO
SQL and PL/SQL Terminator	SET BLOCKTERMINATOR
SQL Case	SET SQLCASE
SQL Compatibility	SET COMPATIBILITY
SQL Terminator	SET SQLTERMINATOR
SQL*Plus Compatibility	SET SQLPLUSCOMPATIBILITY
Substitution Variable Prefix	SET DEFINE
Substitution Variable Reference Terminator	SET CONCAT
Trace Statements	SET AUTOTRACE

Table 1–3 (Cont.) Script Execution

iSQL*Plus Preference	Equivalent SET Command
XQuery Base URI	SET XQUERY BASEURI
XQuery Ordering	SET XQUERY ORDERING
XQUERY Node Identity	SET XQUERY NODE
XQUERY Context	SET XQUERY CONTEXT

Table 1–4 Database Administration

iSQL*Plus Preference	Equivalent SET Command
Archive Log Source	SET LOGSOURCE
Automatic Recovery	SET AUTORECOVERY

Configuring SQL*Plus

This chapter explains how to configure your SQL*Plus command-line, Windows GUI, and *iSQL*Plus* environments. It has the following topics:

- [SQL*Plus and *iSQL*Plus* Environment Variables](#)
- [SQL*Plus and *iSQL*Plus* Configuration](#)
- [iSQL*Plus Application Server Configuration](#)
- [iSQL*Plus Web Browser Configuration](#)
- [Windows Graphical User Interface Configuration](#)

SQL*Plus and *iSQL*Plus* Environment Variables

These environment variables specify the location or path of files used by SQL*Plus and the *iSQL*Plus* Application Server. For other environment variables that influence the behavior of SQL*Plus, see the Oracle Database Administrator's Reference.

Table 2-1 Parameters or Environment Variables influencing SQL*Plus and *iSQL*Plus*

Parameter or Variable	Description
JAVA_HOME	Environment variable to specify the path used to search for the location of the Java home (JDK 1.4 or above). This should usually be set to the Oracle Java home. Example \$ORACLE_HOME/jdk
JRE_HOME	Environment variable to specify the path used to search for the location of the Java Runtime home. This should usually be set to the Oracle Java Runtime home. Example \$JAVA_HOME/jre/bin
LD_LIBRARY_PATH	Environment variable to specify the path used to search for libraries on UNIX and Linux. The environment variable may have a different name on some operating systems, such as DYLD_LIBRARY_PATH on Apple Mac OS, LIBPATH on IBM/AIX-5L, and SHLIB_PATH on HP-UX. Not applicable to Windows operating systems. Example \$ORACLE_HOME/lib
LOCAL	Windows environment variable to specify a connection string. Performs the same function as TWO_TASK on UNIX.

Table 2–1 (Cont.) Parameters or Environment Variables influencing SQL*Plus and

Parameter or Variable	Description
NLS_LANG	Environment variable to specify globalization behavior. In iSQL*Plus, the charset parameter is ignored and is always UTF8. Example <code>american_america.utf8</code>
ORACLE_HOME	Environment variable to specify where SQL*Plus is installed. It is also used by SQL*Plus to specify where message files are located. Examples: <code>d:\oracle\10g</code> <code>/u01/app/oracle/product/v10g</code>
ORA_NLS10	Environment variable to specify the locations of the NLS data and the user boot file in SQL*Plus 10.2. The default location is \$ORACLE_HOME/nls/data. In a system with both Oracle9i and 10g, or a system under version upgrade, you should set ORA_NLS10 for Oracle 10g and set ORA_NLS33 for 9i. The default NLS location in 9i was \$ORACLE_HOME/common/nls/admin/data.
ORACLE_PATH	Environment variable to specify the location of SQL scripts. If SQL*Plus cannot find the file in ORACLE_PATH, or if ORACLE_PATH is not set, it searches for the file in the current working directory. Not applicable to Windows
ORACLE_SID	Environment variable to specify the database instance, optional
PATH	Environment variable to specify the path to search for executables, and DLLs in Windows. Typically includes ORACLE_HOME/bin
SQLPATH	Environment variable or Windows registry entry to specify the location of SQL scripts. SQL*Plus searches for SQL scripts, including <i>login.sql</i> , in the current directory and then in the directories specified by SQLPATH, and in the subdirectories of SQLPATH directories. SQLPATH is a colon separated list of directories. There is no default value set in UNIX installations. In Windows, SQLPATH is defined in a registry entry during installation. For more information about the SQLPATH registry entry, see SQLPATH Registry Entry on page 2-23.
SQLPLUS	Environment variable to specify the location of SQL*Plus message files in Windows. This environment variable is set during installation. It has a default value of: <code>%ORACLE_HOME%\SQLPLUS\MESG</code> Not applicable to UNIX.
SQLPLUS_FONT	Windows registry entry to specify the font face used in the SQL*Plus Windows GUI. If the SQLPLUS_FONT entry is not created, or if it has an invalid name or value, the default face, Fixedsys, is used.
SQLPLUS_FONT_SIZE	Windows registry entry to specify the font size used in the SQL*Plus Windows GUI. If the SQLPLUS_FONT_SIZE entry is not created, or if it has an invalid name or value, the default size, 16, is used.

Table 2–1 (Cont.) Parameters or Environment Variables influencing SQL*Plus and

Parameter or Variable	Description
TNS_ADMIN	<p>Environment variable to specify the location of the tnsnames.ora file. If not specified, \$ORACLE_HOME/network/admin is used</p> <p>Example</p> <pre>h:\network /var/opt/oracle</pre>
TWO_TASK	<p>UNIX environment variable to specify a connection string. Connections that do not specify a database will connect to the database specified in TWO_TASK.</p> <p>Example</p> <pre>TWO_TASK=MYDB export TWO_TASK sqlplus hr</pre> <p>is the same as:</p> <pre>sqlplus hr@MYDB</pre>
iSQLPlusAllowUserMarkup	<p>iSQL*Plus configuration file parameter to specify whether HTML entity mapping replaces characters of special significance with printable representations of those characters. Entity mapping is enabled by default, preventing the use of user defined HTML in iSQL*Plus output. The iSQLPlusAllowUserMarkup parameter controls whether an iSQL*Plus Application Server enables users to change the entity mapping setting, or use the custom HTML header, body, and table tags.</p> <p>For more information about user defined HTML, see Enabling User Defined HTML Markup on page 2-19.</p>
iSQLPlusAllowScriptsURL	<p>iSQL*Plus configuration file parameter to control whether an iSQL*Plus Application Server enables users to load scripts from a URL, run @, @@ and START commands from a script, or use a script loaded from a URL with a Dynamic Report.</p> <p>See Enabling URL Access on page 2-19 for more information.</p>
iSQLPlusBannerMessage	<p>iSQL*Plus configuration file parameter to either remove the default security message from the iSQL*Plus Login screen, or to replace it with your own system-wide message.</p> <p>See Enabling Unauthorised Access Banner on page 2-18 for more information.</p>
iSQLPlusConnectIdList	<p>iSQL*Plus configuration file option to specify the databases that users can access in iSQL*Plus. When enabled, a dropdown list of available databases is displayed in place of the Connection Identifier text field on the Login screen. This enables greater security for iSQL*Plus Servers in hosted environments.</p> <p>For more information about restricted database access, see Enabling Restricted Database Access on page 2-12.</p>
log4j.rootLogger	<p>iSQL*Plus configuration file option to specify the level to which messages are logged in the iSQL*Plus Application Server error logs.</p> <p>For more information about iSQL*Plus logging, see Setting the Level of iSQL*Plus Logging on page 2-11.</p>

SQL*Plus and iSQL*Plus Configuration

You can set up your SQL*Plus or iSQL*Plus Application Server environment to use the same settings with each session.

There are two operating system files to do this:

- The Site Profile file, *glogin.sql*, for site wide settings, and settings for the iSQL*Plus sessions from an iSQL*Plus Application Server.
- Additionally, in the command-line user interface and the Windows GUI, the User Profile, *login.sql*, sets user specific settings.

The exact names of these files is system dependent.

Some privileged connections may generate errors if SET SERVEROUTPUT or SET APPINFO commands are put in the Site Profile or User Profile.

The following tables show the profile scripts, and some commands and settings that affect the Command-line, Windows and iSQL*Plus user interfaces.

Table 2–2 Profile Scripts affecting SQL*Plus User Interface Settings

This script ...	is run in the Command-line and Windows GUI...	is run in the iSQL*Plus Server ...
<p>Site Profile (<i>glogin.sql</i>)</p> <p>Can contain any content that can be included in a SQL*Plus script, such as system variable settings or other global settings the DBA wants to implement.</p>	<p>After successful Oracle Database connection from a SQLPLUS or CONNECT command.</p> <p>Where /NOLOG is specified.</p>	<p>On successful Oracle Database connection from an iSQL*Plus session or a CONNECT command from an iSQL*Plus session.</p>
<p>User Profile (<i>login.sql</i>)</p> <p>Can contain any content that can be included in a SQL*Plus script, but the settings are only applicable to the user's sessions.</p>	<p>Immediately after the Site Profile.</p>	<p>Not Applicable</p>

Table 2–3 Commands in Profile scripts affecting SQL*Plus User Interface Settings

In a profile script, this command ...	affects the Command-line and Windows GUI by ...	affects the iSQL*Plus Server by ...
<p>SET SQLPLUSCOMPAT[IBILITY] [x.y[.z]]</p> <p>Also see the SQL*Plus Compatibility Matrix on page 12-140.</p>	<p>Setting the SQL*Plus compatibility mode to obtain the behavior the DBA wants for this site.</p>	<p>Setting the SQL*Plus compatibility mode to obtain the behavior the DBA wants for this site.</p>
<p>SQLPLUS command COMPATIBILITY Option</p>	<p>As for SET SQLPLUSCOMPATIBILITY but set with the SQLPLUS command COMPATIBILITY option.</p>	<p>Not Applicable</p>
<p>SQLPLUS command RESTRICT Option</p>	<p>Starting SQL*Plus with the RESTRICT option set to 3 prevents the User Profile script from being read.</p>	<p>Not Applicable</p>

Site Profile

A Site Profile script is created during installation. It is used by the database administrator to configure session wide behavior for SQL*Plus Command-line, Windows GUI and *iSQL*Plus* connections.

The Site Profile script is generally named `glogin.sql`. SQL*Plus or the *iSQL*Plus* Server executes this script whenever a user starts a SQL*Plus or *iSQL*Plus* session and successfully establishes the Oracle Database connection.

The Site Profile enables the DBA to set up SQL*Plus environment defaults for all users of a particular SQL*Plus or *iSQL*Plus* Application Server installation

Users cannot directly access the Site Profile.

Default Site Profile Script

The Site Profile script is `$ORACLE_HOME/sqlplus/admin/glogin.sql` in UNIX, and `%ORACLE_HOME%\sqlplus\admin\glogin.sql` in Windows. If a Site Profile already exists at this location, it is overwritten when you install SQL*Plus. If SQL*Plus is removed, the Site Profile script is deleted.

User Profile

For SQL*Plus command-line and Windows GUI connections, SQL*Plus also supports a User Profile script. The User Profile is executed after the Site Profile and is intended to allow users to specifically customize their session. The User Profile script is generally named `login.sql`. SQL*Plus searches for the User Profile in your current directory, and then the directories you specify with the `SQLPATH` environment variable. SQL*Plus searches this colon-separated list of directories and their subdirectories in the order they are listed.

You can add any SQL commands, PL/SQL blocks, or SQL*Plus commands to your user profile. When you start SQL*Plus, it automatically searches for your user profile and runs the commands it contains.

A user profile is not used in *iSQL*Plus*.

Modifying Your LOGIN File

You can modify your LOGIN file just as you would any other script. The following sample User Profile script shows some modifications that you could include:

```
-- login.sql
-- SQL*Plus user login startup file.
--
-- This script is automatically run after glogin.sql
--
-- To change the SQL*Plus prompt to display the current user,
-- connection identifier and current time.
-- First set the database date format to show the time.
ALTER SESSION SET nls_date_format = 'HH:MI:SS';

-- SET the SQLPROMPT to include the _USER, _CONNECT_IDENTIFIER
-- and _DATE variables.
SET SQLPROMPT "_USER'@'_CONNECT_IDENTIFIER _DATE> "

-- To set the number of lines to display in a report page to 24.
SET PAGESIZE 24

-- To set the number of characters to display on each report line to 78.
```

```
SET LINESIZE 78
```

```
-- To set the number format used in a report to $99,999.  
SET NUMFORMAT $99,999
```

See Also:

- [SET](#) command on page 12-89 for more information on these and other SET command variables you may wish to set in your SQL*Plus LOGIN file.
- [Using Predefined Variables](#) on page 5-12 for more information about predefined variables.

Storing and Restoring SQL*Plus System Variables

From the Command-line and Windows GUI you can store the current SQL*Plus system variables in a script with the STORE command. If you alter any variables, this script can be run to restore the original values. This is useful if you want to reset system variables after running a report that alters them. You could also include the script in your User Profile script so that these system variables are set each time you start SQL*Plus.

To store the current setting of all system variables, enter

```
STORE SET file_name
```

Enter a file name and file extension, or enter only the file name to use the default extension .SQL. You can use the [SET SUF\[FIX\] {SQL | text}](#) command on page 12-145 to change the default file extension.

Restoring the System Variables

To restore the stored system variables, enter

```
START file_name
```

If the file has the default extension (as specified by the [SET SUF\[FIX\] {SQL | text}](#) on page 12-145 command), you do not need to add the period and extension to the file name.

You can also use the @ ("at" sign) or the @@ (double "at" sign) commands to run the script.

Example 2-1 Storing and Restoring SQL*Plus System Variables

To store the current values of the SQL*Plus system variables in a new script "plusenv.sql":

```
STORE SET plusenv
```

```
Created file plusenv
```

Now the value of any system variable can be changed:

```
SHOW PAGESIZE
```

```
PAGESIZE 24
```

```
SET PAGESIZE 60
```

```
SHOW PAGESIZE
```

```
PAGESIZE 60
```

The original values of system variables can then be restored from the script:

```
START plusenv
SHOW PAGESIZE
```

```
PAGESIZE 24
```

Installing Command-line Help

Command-line help is usually installed during Oracle Database installation. If not, the database administrator can create the SQL*Plus command-line help tables and populate them with SQL*Plus help data in two ways:

- Running a supplied shell script or batch file from the operating system.
- Running a supplied SQL script from SQL*Plus.

The database administrator can also remove the SQL*Plus command-line help tables by running a SQL script from SQL*Plus.

Before you can install or remove SQL*Plus help, ensure that:

- SQL*Plus is installed.
- The ORACLE_HOME environment variable is set.
- The SQL*Plus help script files exist:
 - HLPBLD.SQL - to drop and create new help tables.
 - HELPDROP.SQL - to drop existing help tables.
 - HELPUS.SQL - to populate the help tables with the help data.

Running the helpins Shell Script or Batch File to Install Command-line Help

Run the provided shell script or batch file to install command-line help.

In UNIX, use the shell script, HELPINS, available in

```
$ORACLE_HOME/BIN
```

In Windows, use the batch file, HELPINS.BAT, available in

```
%ORACLE_HOME%\BIN
```

1. In UNIX, set an environment variable, SYSTEM_PASS, to hold the SYSTEM user login with:

```
SYSTEM_PASS=SYSTEM/password
EXPORT SYSTEM_PASS
```

In Windows, set SYSTEM_PASS with:

```
SET SYSTEM_PASS=SYSTEM/password
```

where *password* is the password you have defined for the SYSTEM user.

Warning: Defining a variable containing your password in plain text is a potential security risk. You can avoid this risk by omitting the password, and responding to system prompts for the password.

If you choose to include your password in the `SYSTEM_PASS` variable, undefine the variable immediately after you have run the `helpins` script or batch file.

2. In UNIX, run the shell script, `HELPINS`, from a terminal with:

```
$_ORACLE_HOME/BIN/HELPINS
```

In Windows, run the batch file, `HELPINS.BAT`, from the command-line with:

```
%ORACLE_HOME%\BIN\HELPINS
```

In either case, the `HELPINS` utility reads the login from `SYSTEM_PASS` to connect to Oracle Database using SQL*Plus, creates and loads the help tables, and then disconnects. You can use command-line help the next time you start SQL*Plus.

Running the `hlpbld.sql` Script to Install Command-line Help

Run the provided SQL script, `HLPBLD.SQL`, to load command-line help.

1. Log in to SQL*Plus as the `SYSTEM` user with:

```
SQLPLUS SYSTEM
```

You are prompted to enter the password you have defined for the `SYSTEM` user.

2. In UNIX run the SQL script, `HLPBLD.SQL`, from SQL*Plus with:

```
@$_ORACLE_HOME/SQLPLUS/ADMIN/HELP/HLPBLD.SQL HELPUS.SQL
```

In Windows run the SQL script, `HLPBLD.SQL`, from SQL*Plus with:

```
@%ORACLE_HOME%\SQLPLUS\ADMIN\HELP\HLPBLD.SQL HELPUS.SQL
```

The `HLPBLD.SQL` script creates and loads the help tables.

Running the `helpdrop.sql` Script to Remove Command-line Help

Run the provided SQL script, `HELPDROP.SQL`, to remove the command-line help.

1. Log in to SQL*Plus as the `SYSTEM` user with:

```
SQLPLUS SYSTEM
```

You are prompted to enter the password you have defined for the `SYSTEM` user.

2. In UNIX run the SQL script, `HELPDROP.SQL`, from SQL*Plus with:

```
@$_ORACLE_HOME/SQLPLUS/ADMIN/HELP/HELPDROP.SQL
```

In Windows run the SQL script, `HELPDROP.SQL`, from SQL*Plus with:

```
@%ORACLE_HOME%\SQLPLUS\ADMIN\HELP\HELPDROP.SQL
```

The `HELPDROP.SQL` script drops the help tables, and then disconnects.

Configuring Oracle Net Services

If you plan to connect to a database other than the default, whether on the same computer or another computer, you need to ensure that Oracle Net is installed, and the database listener is configured and running. Oracle Net services are used by SQL*Plus and the iSQL*Plus Application Server.

Oracle Net services and the database listener are installed by default during Oracle Database installation. For further information about installing and configuring Oracle Net, see the Oracle Database documentation at <http://www.oracle.com/technology/documentation>.

iSQL*Plus Application Server Configuration

You can set the following behavior and security settings on the iSQL*Plus Application Server:

- [Changing the iSQL*Plus Application Server Port in Use](#)
- [Testing if the iSQL*Plus Application Server is Running](#)
- [Setting the Level of iSQL*Plus Logging](#)
- [Setting the Session Time Out](#)
- [Enabling Restricted Database Access](#)
- [Enabling iSQL*Plus DBA Access](#)
- [Enabling SSL with iSQL*Plus](#)
- [Enabling iSQL*Plus or iSQL*Plus Help](#)
- [Enabling User Defined HTML Markup](#)

Changing the iSQL*Plus Application Server Port in Use

After Oracle Database installation, if you are unable to connect to your iSQL*Plus Server, check that your Application Server is running (see [Testing if the iSQL*Plus Application Server is Running](#)), and that you are using the correct URL to connect to it. If you are still unable to connect, it may be because the port that the Application Server is attempting to use is already in use. A message, if any, depends on the application using the port.

To determine the port number used by the iSQL*Plus Application Server

1. Open the configuration file, `http-web-site.xml`, located in

```
$ORACLE_HOME/oc4j/j2ee/isqlplus/config
```

2. Search for the web-site element. It has the form

```
<website port="5560" display-name="Oracle9iAS Containers for J2EE HTTP Web Site">
```

3. The value specified by the attribute, `port`, is the port number that the Application Server is attempting to use.

To view currently used ports and determine if the Application Server is trying to use a port that is already in use, run the following command:

```
netstat -an
```

If there is another application using the same port, you need to change the port used by the Application Server to a number that is not in use. By convention, it is recommended that you use a port number above 2000, and that you do not use 80 or 8080 as they are usually used by web services. A port number can be any unique integer number.

To change the port number used by the iSQL*Plus Application Server

1. Stop the Application Server.
2. Open the configuration file, `http-web-site.xml`, located in

```
$ORACLE_HOME/oc4j/j2ee/isqlplus/config
```

3. Search for the web-site element. It has the form

```
<website port="5560" display-name="Oracle9iAS Containers for J2EE HTTP Web Site">
```

The number specified by the attribute, `port`, is the port number that the Application Server is attempting to use.

4. Change the port number to a unique port number that you want the iSQL*Plus Application Server to use.
5. Save `http-web-site.xml`.
6. Restart the iSQL*Plus Application Server.

Testing if the iSQL*Plus Application Server is Running

You can use operating system utilities to determine if the iSQL*Plus Application Server is running. On Windows, the iSQL*Plus Application Server can be run as a Windows Service, or can be started from a Windows command prompt.

UNIX: To determine if the iSQL*Plus Application Server is running

1. Open a terminal.
2. Enter the following command to find the iSQL*Plus Application Server process:

```
$ ps -eaf|grep Djava
```

One of the lines returned should be something like:

```
oracle 6082 1 0 Nov 05 pts/8 28:42 $ORACLE_HOME/jdk/bin/java  
-Djava.awt.headless=true -Djava.security.properties=/
```

This running process is the iSQL*Plus Application Server.

Windows Service: To determine if the iSQL*Plus Application Server is running

1. Select Services from the **Start > Programs > Administrative Tools** menu.
2. Find the iSQL*Plus Windows service, called `OracleOracleHomeNameiSQL*Plus`.
3. Check the status of the Windows service to see whether it is started.

Windows Command Prompt: To determine if the iSQL*Plus Application Server is running

iSQL*Plus can also be started from a Windows command prompt. To determine whether the iSQL*Plus Application Server was started and is running from the

command line, check whether there is an open Windows command prompt containing messages similar to:

```
%ORACLE_HOME%\bin\isqlplusctl start
iSQL*Plus 10.2.0.1.0
Copyright (c) 2005 Oracle. All rights reserved.

Starting iSQL*Plus ...
iSQL*Plus started.
```

Setting the Level of iSQL*Plus Logging

The *log4j.rootLogger* parameter determines whether logging of iSQL*Plus Application Server messages is enabled. It also sets the level to which messages are logged in the iSQL*Plus Application Server error logs. There should be no need to change its value unless instructed to do so by Oracle Support. Logging is useful to help resolve user problems.

You need to stop the iSQL*Plus Application Server to make changes to the *log4j.rootLogger* parameter. The *log4j.rootLogger* parameter is in the *log4j.properties* file, located in the directory:

```
$ORACLE_HOME/oc4j/j2ee/oc4j_
applications/applications/isqlplus/isqlplus/WEB-INF/classes
```

Logging can be set to ALL errors and messages, DEBUG messages, INFO messages, WARNING messages, ERROR messages, FATAL errors, or to OFF. The settings are changed by commenting or uncommenting the required lines in the *log4j.properties* file. The following example shows the default setting, which is to log FATAL errors:

```
# Set root logger level and its only appender to A1.
#log4j.rootLogger=ALL, A1
#log4j.rootLogger=DEBUG, A1
#log4j.rootLogger=INFO, A1
#log4j.rootLogger=WARN, A1
#log4j.rootLogger=ERROR, A1
log4j.rootLogger=FATAL, A1
#log4j.rootLogger=OFF, A1
```

The iSQL*Plus log file is written to:

```
$ORACLE_HOME/oc4j/j2ee/isqlplus/application-deployments/isqlplus/application.log
```

The iSQL*Plus Help log file is written to:

```
$ORACLE_
HOME/oc4j/j2ee/isqlplus/application-deployments/isqlplushelp/application.log
```

Setting the Session Time Out

Timing out iSQL*Plus sessions helps to reduce machine load and to maximize resources. The time out interval is set by the session-timeout element. It defines the time a session can be idle before it is expired.

You need to stop the iSQL*Plus Application Server to make changes to the session-timeout element. You can edit the *web.xml* configuration file to change the timeout interval. The *web.xml* file is located in the directory:

```
$ORACLE_HOME/oc4j/j2ee/oc4j_applications/applications/isqlplus/isqlplus/WEB-INF
```

In the *web.xml* file, search for the <session-timeout> element inside <session-config>. The syntax of the line to change in the configuration file is:

```
<session-config>
  <session-timeout>15</session-timeout>
</session-config>
```

Where the value is the number of whole minutes of idle time before the session times out. It has a default value of 15 minutes. It can be set to any value from 1 to 1440 minutes. It can also be set to never expire by entering a negative value such as -1. It should not be set so small that users do not get a chance to enter their scripts.

When a user tries to use a timed out iSQL*Plus session, the Login screen is displayed and the user is prompted to log in again. The following error is displayed:

SP2-0864: Session has expired. Please log in again.

Enabling Restricted Database Access

You may want to limit the databases that users can access in iSQL*Plus to a restricted list. When restricted database access has been enabled, a dropdown list of available databases is displayed in place of the Connection Identifier text field on the Login screen. This enables greater security for iSQL*Plus Servers in hosted environments. Connection identifiers are listed in the order defined in iSQLPlusConnectIdList.

You need to stop the iSQL*Plus Application Server to make changes to the iSQLPlusConnectIdList parameter.

Edit the \$ORACLE_

HOME/oc4j/j2ee/oc4j-applications/applications/isqlplus/isqlplus/WEB-INF/web.xml file to restrict database access to iSQL*Plus users. Change the following entry to include a new param-value element which contains the restrictedlist of databases, for example

```
<init-param>
<param-name>iSQLPlusConnectIdList</param-name>
<description>The database(s) to which iSQL*Plus users are restricted. The list
should contain the Oracle SIDs or SERVICE_NAMES, separated by a semicolon (;). If
there are no entries, database access is not restricted through
iSQL*Plus.</description>
<param-value>ora10g;ora9i</param-value>
</init-param>
```

Entries in the param-value element should be identical to the alias for SERVICE_NAMES or SIDs set in your \$ORACLE_HOME/network/admin/tnsnames.ora file.

Connection identifiers are case insensitive, and each connection identifier listed in the argument should be identical to an alias in the tnsnames.ora file.

Once set, all connections made through the Login screen, all dynamic reports and any connections attempted with the CONNECT command are refused unless the connection is to one of the databases in the restricted list. Similarly, if SET INSTANCE is used, the connection identifier defined must match an entry in iSQLPlusConnectIdList or the connection is refused.

WARNING: Enabling the restricted database access does not prevent users from connecting to available remote databases.

If no connection identifier is given, or if the one given does not match an entry in `iSQLPlusConnectIdList`, the database connection is refused and the following error occurs:

```
SP2-0884: Connection to database database_name is not allowed
```

Enabling iSQL*Plus DBA Access

To access the iSQL*Plus DBA URL, you must set up the OC4J user manager. You can set up OC4J to use:

- The XML-based provider type, `jazn-data.xml`
- The LDAP-based provider type, Oracle Internet Directory

You need to stop the iSQL*Plus Application Server to enable iSQL*Plus DBA access.

This document discusses how to set up the iSQL*Plus DBA URL to use the XML-based provider. For more information, refer to the Oracle Application Server documentation, which you can find at <http://www.oracle.com/technology/documentation/>.

To set up the iSQL*Plus DBA URL

1. Create users for the iSQL*Plus DBA URL.
2. Grant the `webDba` role to users.
3. Restart the iSQL*Plus server after making any changes to the JAZN authentication file, `jazn-data.xml`. The JAZN authentication file is changed when you use the JAZN admin tool to set up users for the iSQL*Plus DBA URL.
4. Test iSQL*Plus DBA Access.

The Oracle JAAS Provider, otherwise known as JAZN (Java AuthoriZatioN), is Oracle's implementation of the Java Authentication and Authorization Service (JAAS). Oracle's JAAS Provider is referred to as JAZN in the remainder of this document. See the *Oracle Application Server Containers for J2EE* documentation at <http://www.oracle.com/technology/tech/java/oc4j/index.html> for more information about JAZN, the Oracle JAAS Provider.

Create and Manage Users for the iSQL*Plus DBA URL

The actions available to manage users for the iSQL*Plus DBA URL are:

1. Create users
2. List users
3. Grant the `webDba` role
4. Remove users
5. Revoke the `webDba` role
6. Change user passwords

Note: You perform these actions from the `$ORACLE_HOME/oc4j/j2ee/isqlplus/application-deployments/isqlplus` directory.

`$JAVA_HOME` is the location of your JDK (1.4 or above). It should be set to `$ORACLE_HOME/jdk`.

admin_password is the password for the iSQL*Plus DBA realm administrator user, admin. The password for the admin user is set to 'welcome' by default. You should change this password as soon as possible. See [Change User Passwords](#) on page 2-15 for more information.

A JAZN shell option, and a command-line option are given for all steps.

To start the JAZN shell, enter:

```
$JAVA_HOME/bin/java -Djava.security.properties=$ORACLE_
HOME/oc4j/j2ee/home/config/jazn.security.props -jar $ORACLE_
HOME/oc4j/j2ee/home/jazn.jar -user "iSQL*Plus DBA/admin" -password admin_password
-shell
```

To exit the JAZN shell, enter:

```
EXIT
```

Create Users

You can create multiple users who have access to the iSQL*Plus DBA URL. To create a user from the JAZN shell, enter:

```
JAZN> adduser "iSQL*Plus DBA" username password
```

To create a user from the command line, enter:

```
$JAVA_HOME/bin/java -Djava.security.properties=$ORACLE_
HOME/oc4j/j2ee/home/config/jazn.security.props -jar $ORACLE_
HOME/oc4j/j2ee/home/jazn.jar -user "iSQL*Plus DBA/admin" -password admin_password
-adduser "iSQL*Plus DBA" username password
```

username and *password* are the username and password used to log into the iSQL*Plus DBA URL.

To create multiple users, repeat the above command for each user.

List Users

You can confirm that users have been created and added to the iSQL*Plus DBA realm. To confirm the creation of a user using the JAZN shell, enter:

```
JAZN> listusers "iSQL*Plus DBA"
```

To confirm the creation of a user using the command line, enter:

```
$JAVA_HOME/bin/java -Djava.security.properties=$ORACLE_
HOME/oc4j/j2ee/home/config/jazn.security.props -jar $ORACLE_
HOME/oc4j/j2ee/home/jazn.jar -user "iSQL*Plus DBA/admin" -password admin_password
-listusers "iSQL*Plus DBA"
```

The usernames you created are displayed.

Grant Users the webDbA Role

Each user you created above must be granted access to the webDbA role. To grant a user access to the webDbA role from the JAZN shell, enter:

```
JAZN> grantrole webDbA "iSQL*Plus DBA" username
```

To grant a user access to the webDbA role from the command line, enter:

```
$JAVA_HOME/bin/java -Djava.security.properties=$ORACLE_
HOME/oc4j/j2ee/home/config/jazn.security.props -jar $ORACLE_
```

```
HOME/oc4j/j2ee/home/jazn.jar -user "iSQL*Plus DBA/admin" -password admin_password
-grantrole webDbA "iSQL*Plus DBA" username
```

Remove Users

To remove a user using the JAZN shell, enter:

```
JAZN> remuser "iSQL*Plus DBA" username
```

To remove a user using the command line, enter:

```
$JAVA_HOME/bin/java -Djava.security.properties=$ORACLE_
HOME/oc4j/j2ee/home/config/jazn.security.props -jar $ORACLE_
HOME/oc4j/j2ee/home/jazn.jar -user "iSQL*Plus DBA/admin" -password admin_password
-remuser "iSQL*Plus DBA" username
```

Revoke the webDbA Role

To revoke a user's webDbA role from the JAZN shell, enter:

```
JAZN> revokerole webDbA "iSQL*Plus DBA" username
```

To revoke a user's webDbA role from the command line, enter:

```
$JAVA_HOME/bin/java -Djava.security.properties=$ORACLE_
HOME/oc4j/j2ee/home/config/jazn.security.props -jar $ORACLE_
HOME/oc4j/j2ee/home/jazn.jar -user "iSQL*Plus DBA/admin" -password admin_password
-revokerole "iSQL*Plus DBA" username
```

Change User Passwords

To change a user's password from the JAZN shell, enter:

```
JAZN> setpasswd "iSQL*Plus DBA" username old_password new_password
```

To change a user's password from the command line, enter:

```
$JAVA_HOME/bin/java -Djava.security.properties=$ORACLE_
HOME/oc4j/j2ee/home/config/jazn.security.props -jar $ORACLE_
HOME/oc4j/j2ee/home/jazn.jar -user "iSQL*Plus DBA/admin" -password admin_password
-setpasswd "iSQL*Plus DBA" username old_password new_password
```

Test iSQL*Plus DBA Access

Test iSQL*Plus DBA access by entering the iSQL*Plus DBA URL in your web browser:

```
http://machine_name.domain:5560/isqlplus/dba
```

A dialog is displayed requesting authentication for the iSQL*Plus DBA URL. Log in as the user you created above. You may need to restart iSQL*Plus for the changes to take effect.

Enabling SSL with iSQL*Plus

This is an example of setting up iSQL*Plus to use SSL. This procedure assumes that you have an existing certificate. If not, you can request a certificate from a certification authority (CA). Many CAs provide test certificates for use during testing.

For this procedure, set JAVA_HOME to ORACLE_HOME/jdk, and perform the following steps from the \$ORACLE_HOME/oc4j/j2ee directory.

You need to stop the iSQL*Plus Application Server to enable SSL with iSQL*Plus.

1. Generate Keys and Storage File

Use the keytool utility to generate the keypair (public and private keys), and a keystore (database) to store the keypair:

```
$JAVA_HOME/bin/keytool -genkey -keyalg "RSA" -keystore keystore -storepass 123456  
-validity 100
```

This example uses RSA as the key algorithm, keystore as the storage file name to store the keys, sets the password to access the storage file as 123456, and is valid for 100 days. The keytool utility then prompts you for further information:

```
What is your first and last name?  
[Unknown]: Test User  
What is the name of your organizational unit?  
[Unknown]: IT Department  
What is the name of your organization?  
[Unknown]: Oracle Corporation  
What is the name of your City or Locality?  
[Unknown]: San Francisco  
What is the name of your State or Province?  
[Unknown]: California  
What is the two-letter country code for this unit?  
[Unknown]: US  
  
Is CN=Test User, OU=IT Department, O=Oracle Corporation, L=San Francisco,  
ST=California, C=US correct?  
  
[no]: yes  
  
Enter key password for <mykey>  
(RETURN if same as keystore password):
```

A storage file named keystore is generated in the current directory.

2. Load Root Certificate into Storage File

Load your server's root certificate into the storage file you created in step 1.

```
$JAVA_HOME/bin/keytool -keystore keystore -import -alias servertest -file  
servertest.cer  
Enter keystore password: 123456  
  
Owner: CN=Thawte Test CA Root, OU=TEST TEST TEST, O=Thawte Certification, ST=FO  
TESTING PURPOSES ONLY, C=ZA  
Issuer: CN=Thawte Test CA Root, OU=TEST TEST TEST, O=Thawte Certification, ST=F  
R TESTING PURPOSES ONLY, C=ZA  
Serial number: 0  
Valid from: Thu Aug 01 10:00:00 EST 1996 until: Fri Jan 01 08:59:59 EST 2021  
Certificate fingerprints:  
MD5: 5E:E0:0E:1D:17:B7:CA:A5:7D:36:D6:02:DF:4D:26:A4  
SHA1: 39:C6:9D:27:AF:DC:EB:47:D6:33:36:6A:B2:05:F1:47:A9:B4:DA:EA  
  
Trust this certificate? [no]: yes  
  
Certificate was added to keystore
```

In this example, an alias, servertest, is created for the root certificate, servertest.cer.

3. Request Certificate from CA

Create a certificate request to request a certificate from your CA.

```
$JAVA_HOME/bin/keytool -certreq -keystore keystore -file mycsr.csr
Enter keystore password: 123456
```

In this example, the certificate request file is named `mycsr.csr`. Use the contents of `mycsr.csr` to request a new certificate from your CA. Create a new file called `mycert.cer` and paste in the contents of your new certificate.

4. Import Certificate into Storage File

Import the new certificate obtained in the previous step into the storage file.

```
$JAVA_HOME/bin/keytool -import -trustcacerts -file mycert.cer
Enter keystore password: 123456
```

```
Owner: CN=Test User, OU=IT Department, O=Oracle Corporation, L=San Francisco,
ST=California, C=US
Issuer: CN=Thawte Test CA Root, OU=TEST TEST TEST, O=Thawte Certification, ST=FOR
TESTING PURPOSES ONLY, C=ZA
Serial number: 7988
Valid from: Thu Sep 04 14:12:45 EST 2003 until: Thu Sep 25 14:12:45 EST 2003
Certificate fingerprints:
MD5: F3:E2:1F:6B:5E:E0:8A:7C:7D:94:60:96:28:55:CF:75
SHA1: D2:54:0E:97:86:53:D7:F5:E9:68:BC:C6:BF:42:62:88:38:15:BE:F4
Trust this certificate? [no]: yes
Certificate was added to keystore
```

5. Configure iSQL*Plus to run in SSL mode

Configure iSQL*Plus to run in SSL mode.

1. Copy `http-web-site.xml` to `secure-web-site.xml`

```
cd $ORACLE_HOME/oc4j/j2ee/isqlplus/config
cp http-web-site.xml secure-web-site.xml
```

2. Edit `secure-web-site.xml` and set the port number, and add the attribute `secure="true"`:

```
<web-site port="4443" secure="true" display-name="Oracle9iAS Containers for
J2EE HTTP Web Site">
```

The port you use for iSQL*Plus in SSL mode can be any free port on your machine. In this example, it is set to port 4443. The default SSL port is 443.

3. Add a new element to the web-site element in the `secure-web-site.xml` file.

```
<ssl-config keystore="/oracle/ora10g/oc4j/j2ee/keystore"
keystore-password="123456" />
```

Note: You can hide the password through password indirection. See *Oracle Application Server Containers for J2EE Security Guide* for a description of password indirection.

4. Edit `server.xml` to refer to the `secure-web-site.xml` file:

```
<web-site default="true" path="./secure-web-site.xml" />
```

For detailed information about implementing SSL, see the *Oracle Application Server Containers for J2EE Security Guide*.

Enabling iSQL*Plus or iSQL*Plus Help

You can edit the Application Server configuration file to enable or disable iSQL*Plus or iSQL*Plus Help.

To disable iSQL*Plus or iSQL*Plus Help

1. Stop the Application Server.
2. Open server.xml located in \$ORACLE_HOME/oc4j/j2ee/isqplus/config.
3. Find the application tag for iSQL*Plus. It has the form <application name="isqplus" ...>. To disable iSQL*Plus, wrap with the comment tags, <!-- and -->. To enable iSQL*Plus, remove the comment tags. The syntax of the line to change in the configuration file to disable or enable iSQL*Plus is:

```
<!-- application name="isqplus" path="../applications/isqplus.ear"
auto-start="true" />
```

or find the application tag for iSQL*Plus Help. It has the form, <application name="isqplushelp" ...>. To disable iSQL*Plus Help, wrap with the comment tags, <!-- and -->. To enable iSQL*Plus Help, remove the comment tags. The syntax of the line to change in the configuration file to disable or enable iSQL*Plus Help is:

```
<!-- application name="isqplushelp" path="../applications/isqplushelp.ear"
auto-start="true" />
```

4. Start the Application Server.

Enabling Unauthorised Access Banner

The iSQLPlusBannerMessage configuration parameter enables you to either remove the default security message displayed on the iSQL*Plus Login screen, or to create your own message. You can use it to display a system-wide broadcast message such as a disclaimer or a scheduled downtime message. The default message displayed is:

```
Unauthorized use of this site is prohibited and may be subject to civil and
criminal prosecution.
```

You need to stop the iSQL*Plus Application Server to change the message.

You can edit the configuration file, *web.xml*, to set iSQLPlusBannerMessage to a new value. The *web.xml* file is located in the directory:

```
$ORACLE_HOME/oc4j/j2ee/oc4j_applications/applications/isqplus/isqplus/WEB-INF
```

In the *web.xml* file, search for the <param-name> iSQLPlusBannerMessage. The syntax of the line to change in the configuration file is:

```
<init-param>
<param-name>iSQLPlusBannerMessage</param-name>
<param-value/>
<description>A text message displayed on the iSQL*Plus login screen.</description>
</init-param>
```

To change the default message, replace

```
<param-value/>
```

with

```
<param-value>new_message</param-value>
```

where *new_message* is the text of the new message you want to display in place of the default message. Use the HTML whitespace entity * * to display no banner message.

Enabling URL Access

The `iSQLPlusAllowScriptsURL` configuration parameter controls whether an *iSQL*Plus* Application Server enables users to load scripts from a URL, run `@`, `@@` and `START` commands from a script, or use a script loaded from a URL with a Dynamic Report.

You need to stop the *iSQL*Plus* Application Server to change this configuration parameter.

You can edit the configuration file, *web.xml*, to set `iSQLPlusAllowScriptsURL` to YES or NO. The *web.xml* file is located in the directory:

```
$ORACLE_HOME/oc4j/j2ee/oc4j_applications/applications/isqlplus/isqlplus/WEB-INF
```

In the *web.xml* file, search for the `<param-name> iSQLPlusAllowScriptsURL`. The syntax of the line to change in the configuration file is:

```
<init-param>
<param-name>iSQLPlusAllowScriptsURL</param-name>
<param-value>no</param-value>
<description>Enables and disables the Dynamic Report URL and Upload
from URL functionality, and prevents @, @@ and START from
accessing URLs. Valid values are: yes | no</description>
</init-param>
```

If the parameter is set to NO, or if it does not exist or has an invalid value, users cannot load scripts from a URL. The default value for `iSQLPlusAllowScriptsURL` is NO. When URL access is disabled, the URL field does not appear on the Load Script screen. Any attempt to run `@`, `@@` or `START` commands gives the message:

```
SP2-0936 URL access is disabled in iSQL*Plus
```

If the parameter is set to YES, users can load scripts from a URL, run `@`, `@@` and `START` commands from a script, or use a script loaded from a URL with a Dynamic Report.

Enabling User Defined HTML Markup

The `iSQLPlusAllowUserMarkup` configuration option controls whether an *iSQL*Plus* Application Server enables users to use custom HTML in scripts.

You need to stop the *iSQL*Plus* Application Server to enable user defined HTML markup.

You can edit the configuration file, *web.xml*, to set `iSQLPlusAllowUserMarkup` to ALL or NONE. The *web.xml* file is located in the directory:

```
$ORACLE_HOME/oc4j/j2ee/oc4j_applications/applications/isqlplus/isqlplus/WEB-INF
```

In the *web.xml* file, search for the `<param-name> iSQLPlusAllowUserMarkup`. The syntax of the line to change in the configuration file is:

```
<init-param>
<param-name>iSQLPlusAllowUserMarkup</param-name>
<param-value>none</param-value>
<description>Valid values are: none | all</description>
```

</init-param>

If the parameter is set to NONE, or if it does not exist or has an invalid value, users cannot use SET MARKUP HTML HEAD *text* BODY *text* TABLE *text* ENTMAP or COLUMN ENTMAP to create user defined HTML. If Map Special Characters to HTML Entities is set OFF in the Script Formatting Preferences screen, the value is ignored and reverts to ON. The default value for iSQLPlusAllowUserMarkup is NONE. Leaving it set to NONE provides greater security.

Where the parameter is set to ALL, users can execute SET MARKUP HTML HEAD *text* BODY *text* TABLE *text* ENTMAP and COLUMN ENTMAP commands to change the status of entity mapping for the iSQL*Plus session or report column. This enables custom HTML to be included in iSQL*Plus report output.

iSQL*Plus Web Browser Configuration

Your web browser needs to be configured to enable cookies and JavaScript.

Your iSQL*Plus interface and online help default to the language of the operating system. However, data you retrieve and enter is determined by the *language* and *territory* parameters set by the NLS_LANG environment variable. The charset parameter is ignored and is always UTF8. See [Chapter 11, "SQL*Plus Globalization Support"](#) for more information.

Session Integrity

Each iSQL*Plus login is uniquely identified, so you can:

- Connect multiple times from the same machine
- Connect multiple times from different machines

iSQL*Plus supports this stateful behavior by storing session context information in the Application Server. You must ensure that your Application Server always routes HTTP requests to the same server, otherwise the session context will not be found. However, you may find it useful to start more than one Application Server to distribute user load across multiple servers.

Retained Session Settings

Certain settings from a session are either retained or automatically entered the next time you log in to iSQL*Plus from the same workstation:

- Script Input area size
- Number of History entries

Your username, password and Output preferences are not saved by iSQL*Plus. Your login details may be retained by your web browser.

Windows Graphical User Interface Configuration

Configuring the Windows Graphical User Interface is discussed in the following topics:

- [Setting Options and Values Using the Environment Dialog](#)
- [Customizing Registry Entries that affect SQL*Plus on Windows](#)

Setting Options and Values Using the Environment Dialog

Choose Environment from the Options menu to display the Environment dialog which you can use to create a SQL environment statement for the current session.

Choose an item from the Set Options list to begin. You can use the default settings, or you can customize the settings by using the other dialog controls. The available controls vary with the options you choose. You can make multiple changes to options and values. When the text box is available, you can enter appropriate text or appropriate numeric values. Click OK to commit your settings.

Note: Options introduced in SQL*Plus Release 8.1 can only be accessed through the command-line and are not available in the SQL*Plus for Windows Environment dialog. These options are:

SET APPINFO

SET LOBOFFSET

SET MARKUP

SET SHIFTINOUT

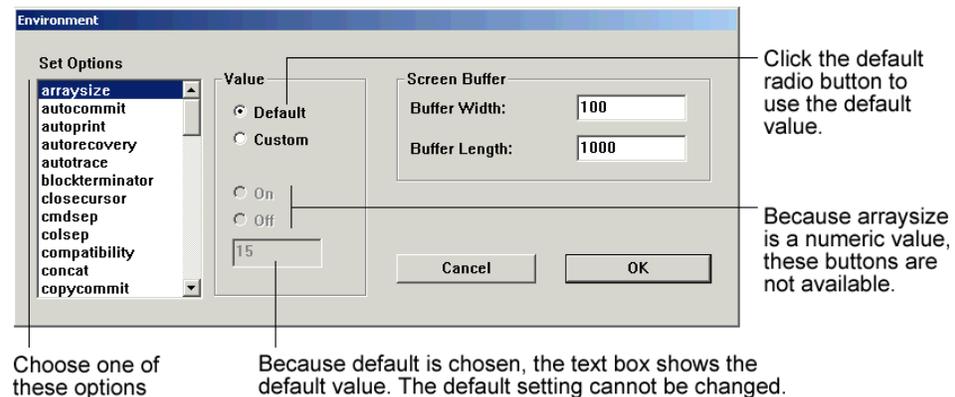
SET SQLBLANKLINES

SET SQLPLUSCOMPATIBILITY {ON | OFF}

See "Command Reference" in the *SQL*Plus User's Guide and Reference* for descriptions of these SET commands.

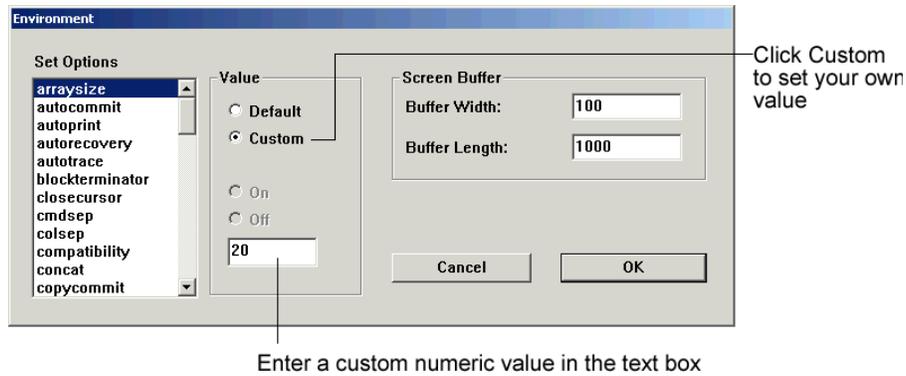
Example 2-2 A default setting in the Environment Dialog

The ARRAYSIZE is set to 15, the default value.



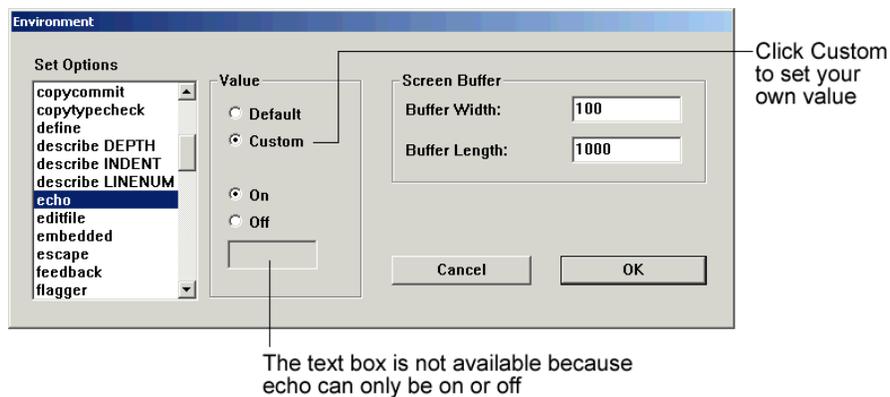
Example 2-3 Setting ARRAYSIZE in the Environment Dialog

To change the ARRAYSIZE, click Custom and enter the number in the text box.



Example 2-4 Setting ECHO in the Environment Dialog

The default for ECHO is off. To change the setting, click Custom and then click On.



Customizing Registry Entries that affect SQL*Plus on Windows

This section describes how to customize your Windows GUI and command-line interface configuration by setting Windows registry entries.

WARNING: Microsoft does not recommend modifying the registry. Editing the registry may affect your operating system and software installation. Only advanced users should edit the registry. Oracle takes no responsibility for problems arising from editing the Windows registry.

Using the Registry

When you install Oracle products for Windows, Oracle Universal Installer adds relevant parameters to the Windows registry.

The following table indicates which registry version(s), REGEDT32.EXE or REGEDIT.EXE, you can use for your particular Windows platform:

Windows Platform	REGEDT32.EXE	REGEDIT.EXE
Windows XP Pro	YES	YES
Windows 2000	YES	YES

The HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE subkey contains the Oracle Database parameters.

See the Registry Editor's help system for instructions on how to edit the registry entries defining Oracle Database parameters.

If you change the value of an Oracle Database related registry entry or add a registry entry, you should restart SQL*Plus to ensure the changes take effect.

SQLPATH Registry Entry

The SQLPATH registry entry specifies the location of SQL scripts. SQL*Plus searches for SQL scripts in the current directory and then in the directories specified by the SQLPATH registry entry, and in the subdirectories of SQLPATH directories.

The HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\HOME0 registry subkey (or the HOME*n* directory for the associated ORACLE_HOME) contains the SQLPATH registry entry. SQLPATH is created with a default value of %ORACLE_HOME%\DBS. You can specify any directories on any drive as valid values for SQLPATH.

When setting the SQLPATH registry entry, you can concatenate directories with a semicolon (;). For example:

```
C:\ORACLE\ORA10\DATABASE;C:\ORACLE\ORA10\DBS
```

See the Registry Editor's help system for instructions on how to edit the SQLPATH registry entry.

SQLPLUS_FONT Registry Entry

The SQLPLUS_FONT registry entry defines the font face used in the SQL*Plus Windows GUI. It is located in the registry subkey, HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\HOME0. If the SQLPLUS_FONT entry is not created, or if it has an invalid name or value, the default face, Fixedsys, is used.

See [To Change the Windows GUI Font and Font Size](#) on page 1-6 for details on how to create the SQLPLUS_FONT registry entry and set the font face. See the Registry Editor's help system for instructions on how to edit the SQLPLUS_FONT registry entry.

SQLPLUS_FONT_SIZE Registry Entry

The SQLPLUS_FONT_SIZE registry entry defines the font size used in the SQL*Plus Windows GUI. It is located in the registry subkey, HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\HOME0. If the SQLPLUS_FONT_SIZE entry is not created, or if it has an invalid name or value, the default size, 16, is used.

See [Changing the Windows GUI Font and Font Size](#) on page 1-6 for details on how to create the SQLPLUS_FONT_SIZE registry entry and set the font size. See the Registry Editor's help system for instructions on how to edit the SQLPLUS_FONT_SIZE registry entry.

Starting SQL*Plus

This chapter describes how to start, login, and connect to a database, how to get help, and how to exit SQL*Plus.

Specific topics discussed are:

- [Login Username and Password](#)
- [Connecting to a Database](#)
- [Starting SQL*Plus](#)
- [Exiting SQL*Plus](#)
- [SQLPLUS Program Syntax](#)

Login Username and Password

When you start SQL*Plus, you need a username and password to login to an Oracle Database schema. Your username and password identify you as an authorized user of the Oracle Database schema.

The database administrator (DBA) is responsible for creating your database account with the necessary privileges and giving you the username and password that enables you to access your account.

Default logins are created and you are prompted for associated passwords during Oracle Database installation. Some of the default login usernames created are:

- SYS
- SYSTEM
- HR

Logins are created and displayed in messages during Oracle Database installation.

For further information about the default logins, see the *Oracle Database Administrator's Guide*.

Once you have logged in, you can connect under a different username using the CONNECT command. The username and password must be valid for the database. For example, to connect the username TODD to the default database using the password FOX, you could enter

```
CONNECT TODD
```

You are prompted to enter the password, FOX.

In the command-line interface, if you omit the username and password, SQL*Plus prompts you for them. Because CONNECT first disconnects you from your current database, you will be left unconnected to any database if you use an invalid username and password in your CONNECT command.

If you log on or connect as a user whose account has expired, you are prompted to change your password before you can connect.

If an account is locked, a message is displayed and connection as this user is not permitted until the account is unlocked by your DBA.

You can use the DISCONNECT command to disconnect from a database without leaving SQL*Plus.

Secure External Password Store

As a command-line alternative for large-scale deployments where applications use password credentials to connect to databases, it is possible to store such credentials in a client-side Oracle wallet. An Oracle wallet is a secure software container that is used to store authentication and signing credentials.

Storing database password credentials in a client-side Oracle wallet eliminates the need to embed usernames and passwords in application code, batch jobs, or scripts. This reduces the risk of exposing passwords in the clear in scripts and application code, and simplifies maintenance because you need not change your code each time usernames and passwords change. In addition, not having to change application code also makes it easier to enforce password management policies for these user accounts.

When you configure a client to use the external password store, applications can use the following syntax to connect to databases that use password authentication:

```
CONNECT /@database_alias
```

Note that you need not specify database login credentials in this CONNECT statement. Instead your system looks for database login credentials in the client wallet.

See Also: *Oracle Database Security Guide* for information about configuring your client to use secure external password store and for information about managing credentials in it.

Expired Password

In the command-line interface, if your password has expired, SQL*Plus prompts you to change it when you attempt to log in. You are logged in once you successfully change your password.

Expired Password Screen in iSQL*Plus

If your password has expired, the Expired Password screen is automatically displayed when you attempt to log in. Fill out the fields on the Expired Password screen as you would for the Change Password screen.

You are logged in once you successfully change your password. If you click the Cancel button, you are returned to the Login screen.

ORACLE
iSQL*Plus

Expired Password

Your password has expired. Change your password to log into iSQL*Plus.

Indicates required field

- Username
- Old Password
- New Password
- Retype New Password

Cancel Apply

Copyright © 2002, Oracle Corporation. All rights reserved. [Help](#)

Changing your Password

In the command-line interface, you can change your password with the `PASSWORD` command. See [PASSWORD](#) on page 12-70.

Changing Your Password in iSQL*Plus

You can change your Oracle Database account password in the Change Password screen. If you have logged in with DBA privileges, you can change the password of other users. You access the Change Password screen from the Preferences screen.

ORACLE
iSQL*Plus

Logout Preferences Help

Workspace History

Change Password

Indicates required field

- Username
- Old Password
- New Password
- Retype New Password

Cancel Apply

Workspace | History | Logout | Preferences | Help

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Username:

Enter your Oracle Database account username.

Old password:

Enter your current Oracle Database account password.

New password:

Enter your new password.

Retype new password:

Enter your new password again to make sure you have entered it correctly.

Apply

Click the Apply button to change the password for your Oracle Database account.

Cancel

Click the Cancel button to clear the screen without changing your password.

Connecting to a Database

You must connect to an Oracle Database (instance) before you can query or modify data in that database. You can connect to the default database and to other databases accessible through your network. To connect to another database over a network, both databases must have Oracle Net configured, and have compatible network drivers. You must enter either a connection identifier or a net service name to connect to a database other than the default.

The connection identifier or net service name is entered:

- as an argument to the [SQLPLUS Program Syntax](#) when starting a command-line session.
- in the Connection Identifier field in the [iSQL*Plus Login Screen](#) when starting iSQL*Plus.
- in the Host String field in the Log On dialog when [Starting the Windows Graphical User Interface](#).
- as an argument to the [CONNECT](#) command from a current session.

Net Service Name

Your DBA is responsible for creating the databases you use and defining net service names for them in the *tnsnames.ora* file. In iSQL*Plus, your DBA can also restrict the databases available to those shown in a dropdown list of net service names.

A net service name definition in the *tnsnames.ora* file has the syntax:

```
net_service_name=
(DESCRIPTION=
(AADDRESS=(PROTOCOL=tcp) (HOST=host) (PORT=port) )
(CONNECT_DATA=
(SERVICE_NAME=service_name) ) )
```

To use a net service name (alias), it must have an entry in the *tnsnames.ora* file on the machine running SQL*Plus, or for iSQL*Plus, the machine running the iSQL*Plus Application Server. An entry in *tnsnames.ora* is not required if you use a connection identifier.

Example 3-1 The tnsnames.ora entry for the sales database

```
SALES1 =
(DESCRIPTION =
(AADDRESS=(PROTOCOL=tcp) (HOST=sales-server) (PORT=1521) )
(CONNECT_DATA=
(SERVICE_NAME=sales.us.acme.com) ) )
```

Example 3–2 Start a command-line session to the sales database using the net service name

```
SQLPLUS hr@SALES1
```

See the *Oracle Database Net Services Reference* and the *Oracle Database Net Services Administrator's Guide* for more information about database connections and net service name definitions.

Full Connection Identifier

Depending on your configuration, use the full connection identifier syntax like:

```
(DESCRIPTION=
(AADDRESS= (PROTOCOL=tcp) (HOST=host) (PORT=port) )
(CONNECT_DATA=
(SERVICE_NAME=service_name) ) )
```

The `SERVICE_NAME` is the global database name entered during database creation. It combines a database name with a domain name. For example, the `SERVICE_NAME` `sales.us.acme.com` has a database name of `sales` and a domain of `us.acme.com`.

An `INSTANCE_NAME` is the name you give to the database instance during creation. It defaults to the `SID` you entered during database creation.

An Oracle System Identifier (`SID`) identifies a specific Oracle release 8.0 database instance.

You can optionally use an `INSTANCE_NAME` in place of the `SERVICE_NAME` phrase.

Use a `SID` in place of the `SERVICE_NAME` when connecting to an Oracle release 8.0 or earlier database.

Example 3–3 Full connection identifier for SALES1

```
SQLPLUS hr@(DESCRIPTION=
(AADDRESS= (PROTOCOL=tcp) (HOST=sales-server) (PORT=1521) )
(CONNECT_DATA=
(SERVICE_NAME=sales.us.acme.com) ) )
```

Easy Connection Identifier

The easy or abbreviated connection identifier has the syntax:

```
[//]host[:port] [/service_name]
```

Example 3–4 Start a command-line session to the sales database using the easy connection identifier

```
sqlplus hr@sales-server:1521/sales.us.acme.com
```

Example 3–5 CONNECT to the sales database using the easy connection identifier

```
connect hr@sales-server:1521/sales.us.acme.com
```

The easy connection identifier can be used wherever you can use a full connection identifier, or a net service name. The easy syntax is less complex, and no `tnsnames.ora` entry is required.

Connectionless Session with /NOLOG

In the command-line interface, it is possible to start SQL*Plus without connecting to a database. This is useful for performing some database administration tasks, writing transportable scripts, or to use SQL*Plus editing commands to write or edit scripts.

You use the /NOLOG argument to the SQLPLUS command to start a connectionless command-line session. After SQL*Plus has started you can connect to a database with the CONNECT command.

Example 3–6 Start a connectionless SQL*Plus session with /NOLOG

```
SQLPLUS /NOLOG
```

Starting SQL*Plus

If you are connecting to a remote Oracle database, make sure your Oracle Net software is installed and working properly. For more information, see the *Oracle Database Net Services Administrator's Guide*.

When you start a SQL*Plus command-line or Windows GUI session, and after a CONNECT command in that session, the site profile, *glogin.sql*, and the user profile file, *login.sql*, are processed:

- After SQL*Plus starts and connects, and prior to displaying the first prompt.
- After SQL*Plus starts and connects, and prior to running a script specified on the command line.
- Prior to the first prompt when /NOLOG is specified on the command line and no connection is made.

The site profile file, *glogin.sql* is processed first, then the user profile file, *login.sql*.

When you start an *iSQL*Plus* session, and after a CONNECT command in that session, the site profile, *glogin.sql*, is processed:

- After *iSQL*Plus* starts and connects.
- After *iSQL*Plus* starts and connects, and prior to running a script specified in a dynamic URL.

Behavior in SQL*Plus 10.1 may be unexpected depending on the setting of SET SQLPLUSCOMPATIBILITY. For example, processing *glogin.sql* and *login.sql* after a CONNECT command only occurs with the default SQLPLUSCOMPATIBILITY setting of 10.1. For more information, see [SET SQLPLUSCOMPAT\[IBILITY\] {x.y\[.z\]}](#) on page 12-140.

Starting Command-line SQL*Plus

To begin using SQL*Plus, you must first understand how to start and stop SQL*Plus.

Example 3–7 Starting SQL*Plus

This example shows you how to start SQL*Plus:

1. Make sure that SQL*Plus has been installed on your computer.
2. Log on to the operating system (if required).
3. Enter the command, SQLPLUS, and press Return.

Note: Some operating systems expect you to enter commands in lowercase letters. If your system expects lowercase, enter the SQLPLUS command in lowercase.

SQLPLUS

SQL*Plus displays its version number, the current date, and copyright information, and prompts you for your username (the text displayed on your system may differ slightly):

```
SQL*Plus: Release 10.2.0.1.0 - Production on Thu Jun 2 16:29:01 2005
(c) Copyright 1982, 2005 Oracle Corporation. All rights reserved.
Enter user-name:
```

4. Enter your username and press Return. SQL*Plus displays the prompt "Enter password:".
5. Enter your password and press Return again. For your protection, your password does not appear on the screen.

The process of entering your username and password is called logging in. SQL*Plus displays the version of Oracle Database to which you connected and the versions of available tools such as PL/SQL.

Next, SQL*Plus displays the SQL*Plus command prompt:

SQL>

The SQL*Plus command prompt indicates that SQL*Plus is ready to accept your commands.

If SQL*Plus does not start, you should see a message to help you correct the problem.

Getting Command-line Help

To access command-line help for SQL*Plus commands, type HELP or ? followed by the command name at the SQL command prompt or in the *i*SQL*Plus Workspace Input area. See the [HELP](#) command on page 12-64 for more information. For example:

```
HELP ACCEPT
```

To display a list of SQL*Plus commands, type HELP followed by either TOPICS or INDEX. HELP TOPICS displays a single column list of SQL*Plus commands. HELP INDEX displays a four column list of SQL*Plus commands which fits in a standard screen. For example:

```
HELP INDEX
```

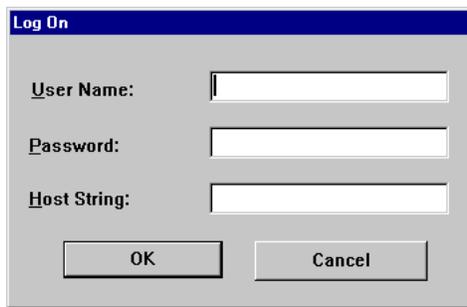
Starting the Windows Graphical User Interface

The graphical user interface can be started from the Windows menu, or from a Windows command prompt.

Starting the GUI from the Windows Menu

1. Select Programs in the Start menu. Then select Oracle - ORACLE_HOME, then Application Development, and click SQL Plus.

The SQL*Plus window appears displaying the Log On dialog.



Enter a valid user name and password. If you are connecting to a remote Oracle database, enter the Oracle Net connect identifier in the Host String field. To connect to the default database, leave the Host String field blank. See [Easy Connection Identifier](#) earlier for more information about configuring and using Oracle Net connect identifiers.

2. Click OK.

Starting the GUI from the Windows Command Prompt

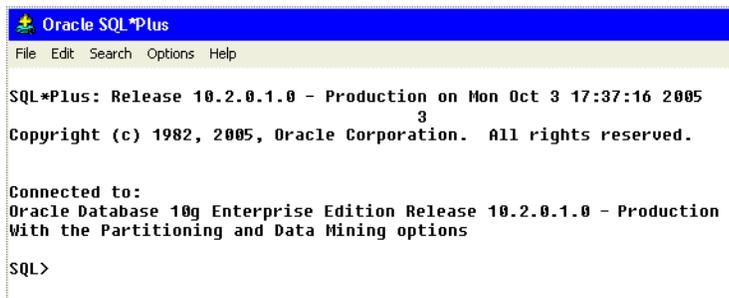
1. Select Command Prompt from Programs->Accessories in the Start menu. A Command Prompt window appears.
2. Enter

```
C:\> SQLPLUSW
```

The SQL*Plus graphical user interface starts. You can optionally include your login username and password separated by a slash (/), and a database to connect to. However, for security reasons, it is recommended that you never include your password in plain text. You are always prompted to enter your password if you start the SQL*Plus GUI with:

```
C:\> SQLPLUSW username@connect_identifier
```

Otherwise enter the required information in the login dialog as described in [Starting SQL*Plus](#) earlier. The Oracle SQL*Plus application window appears.



Starting the iSQL*Plus Application Server

The iSQL*Plus Application Server must be running on the middle tier before you can start an iSQL*Plus session. A command-line utility and a Windows Service are supplied to start and stop iSQL*Plus on Windows.

The iSQL*Plus Application Server is started by default during Oracle Database installation.

To Start the iSQL*Plus Application Server on Unix

1. Start a terminal session.
2. Enter

```
$ORACLE_HOME/bin/isqlplusctl start
```

The *iSQL*Plus* Application Server is started.

To Start the iSQL*Plus Application Server on Windows

1. Select Services from the **Start > Programs > Administrative Tools** menu.
2. Locate the *iSQL*Plus* Windows Service, `OracleOracleHomeNameiSQL*Plus`.
3. Start the Windows Service.

Alternatively, you can start *iSQL*Plus* from a command prompt.

To Start iSQL*Plus Application Server from a Command Prompt

1. Start a command prompt session.
2. Enter

```
%ORACLE_HOME%\bin\isqlplusctl start
```

The *iSQL*Plus* Application Server is started.

To Test If the iSQL*Plus Application Server Has Started Correctly

1. Enter the *iSQL*Plus* URL in your web browser. The *iSQL*Plus* URL is in the form:

```
http://machine_name:5560/isqlplus/
```

*iSQL*Plus* uses HTTP port 5560 by default. If *iSQL*Plus* is not available on port 5560, read the `$ORACLE_HOME/install/portlist.ini` file to find the port on which *iSQL*Plus* is running.

2. Enter one of the following URLs from a web browser on the machine running the *iSQL*Plus* Application Server if you do not know the *iSQL*Plus* URL:

```
http://127.0.0.1:5560/isqlplus/
http://localhost:5560/isqlplus/
```

The *iSQL*Plus* Login screen should be displayed.

3. Enter the same URL you used in step 2, without `"isqlplus/"` if the *iSQL*Plus* Login screen was not displayed in step 2. This is to establish whether the OC4J instance has started correctly:

```
http://127.0.0.1:5560/
http://localhost:5560/
```

The OC4J default page should be displayed.

If the OC4J default page is not displayed, the *iSQL*Plus* Application Server is not running. Also see [Testing if the iSQL*Plus Application Server is Running](#) on page 2-10.

To Check the HTTP Port used by the iSQL*Plus Application Server

To discover the HTTP port number used by the *iSQL*Plus* Application Server, search the `$ORACLE_HOME/install/portlist.ini` file on the Application Server. Also see [Changing the iSQL*Plus Application Server Port in Use](#) on page 2-9.

Stopping the iSQL*Plus Application Server

To Stop the iSQL*Plus Application Server on Unix

1. Start a command-line session.
2. Enter

```

$ORACLE_HOME/bin/isqlplusctl stop
```

The iSQL*Plus Application Server is stopped.

To Stop the iSQL*Plus Application Server on Windows

1. Select Services from the **Start > Programs > Administration Tools** menu.
2. Locate the iSQL*Plus Windows Service, `OracleOracleHomeNameiSQL*Plus`.
3. Stop the Windows Service.

To Stop the iSQL*Plus Application Server from the Command Prompt

1. Start a command-line session.
2. Enter

```

%ORACLE_HOME%\bin\isqlplusctl stop
```

The iSQL*Plus Application Server is stopped.

Once stopped, no iSQL*Plus sessions are possible through this server until the iSQL*Plus Application Server is restarted.

Starting iSQL*Plus

To start an iSQL*Plus session

1. Enter the Uniform Resource Locator (URL) of iSQL*Plus in the Location field of your web browser, for example:

```
http://machine_name.domain:port/isqlplus
```

where *machine_name.domain* is the URL, and *port* is the port number for the Application Server you want to use. The iSQL*Plus Login screen is displayed.

Each successful login is uniquely identified, so you can have multiple iSQL*Plus sessions running from the same machine, or from multiple client machines.

2. Enter your Username, Password and Connection Identifier. See [Login Username and Password](#) and [Connecting to a Database](#) for more information.
3. Click the Login button. The iSQL*Plus Workspace is displayed.

Starting iSQL*Plus as a DBA

To start an iSQL*Plus session with SYSDBA or SYSOPER privileges, you use the iSQL*Plus DBA URL which has the form:

```
http://machine_name:port/isqlplus/dba/
```

To access the iSQL*Plus DBA URL, you must set up login credentials using the Oracle JAAS Provider, known as JAZN (Java AuthoriZatioN). See [Enabling iSQL*Plus DBA Access](#) on page 2-13 for information on accessing the iSQL*Plus DBA URL.

When you are connected through the *iSQL*Plus* DBA URL, the Application Server authentication enables AS SYSDBA or AS SYSOPER connections through the DBA Login screen, or through a CONNECT command, but the Oracle Database username and password authentication may still prevent access.

Starting *iSQL*Plus* from a URL

You can start *iSQL*Plus* and pass URL variables, SQL scripts and substitution variables by sending a request from a URL.

SQL scripts must be available through HTTP or FTP, or passed to *iSQL*Plus* as a URL variable. *iSQL*Plus* executes the script and returns the results in a web browser window, or loads the script into the Workspace.

You can start *iSQL*Plus* as a normal user, or with SYSDBA or SYSOPER privileges.

The syntax to enter in your web browser's Location/ Address field to start *iSQL*Plus* as a normal user is:

```
http://machine_name.domain:port/isqlplus[/dynamic?UserOpts]
```

or to start *iSQL*Plus* with SYSDBA or SYSOPER privileges, use:

```
http://machine_name.domain:port/isqlplus/dba[/dynamic?DBAOpts]
```

where

machine_name.domain is the URL of the Application Server

port is the number of the port used by the Application Server

UserOpts is *UserLogin* | *Script* | *UserLogin&Script*

DBAOpts is *DBALogin* | *Script* | *DBALogin&Script*

and

UserLogin is *userid=username[/password][@connect_identifier]*

DBALogin is *userid={username[/password][@connect_identifier]*
| / } AS {SYSDBA | SYSOPER}

Script is *script=text[&type={url | text}][&action={execute | load}][&variable=value ...]*

If there is no *userid* URL parameter or if it has incomplete information, *iSQL*Plus* displays the login screen. If the URL parameter is complete and the login information is valid, *iSQL*Plus* connects and continues with the request.

SQL script parameters can be given in any order. If any user variable script parameter begins with a reserved keyword, such as *script* or *userid*, *iSQL*Plus* may interpret it as a command rather than as a literal parameter.

If the URL parameter type is *url*, or if it is not specified, the script parameter is assumed to be the URL of a SQL script.

If the URL parameter type is *text*, the text in the script parameter is assumed to be the contents of the SQL script itself. There may be HTML character set restrictions on scripts passed using this method.

If the URL parameter action is *execute*, or if it is not specified, the SQL script is executed in *iSQL*Plus*.

If the URL parameter action is *load*, the script is loaded into the Workspace, but it is not executed. A web browser may not be able to display large scripts in the Workspace, and as a result, scripts may be truncated.

Warning: Entering your password in a URL in plain text is a potential security risk. You can avoid this risk by omitting the password, and responding to system prompts for it.

Examples

To log into *iSQL*Plus* with the username HR and be prompted for your password, enter

```
http://machine_name.domain:5560/isqlplus/dynamic?userid=HR
```

To execute a script that is located at the URL `http://machine_name2.domain/myscript.sql` in *iSQL*Plus*, and be prompted for username and password, enter

```
http://machine_name.domain:5560/isqlplus/dynamic?script=http://machine_name2.domain/myscript.sql
```

To execute a script that is located at a URL, pass the username, be prompted for the password, login to a database, and pass parameters to the script to provide values for substitution variables, enter

```
http://machine_name.domain:5560/isqlplus/dba/dynamic?userid=hr@oracle10g%20as%20sysdba&script=ftp://machine_name2.domain/script.sql&name=*&salary=12000
```

As the *iSQL*Plus* DBA URL is used, Application Server authentication is also required. As spaces are not supported, they have been encoded as `%20` in this example.

To load a script into *iSQL*Plus* without passing the username and password, enter

```
http://machine_name.domain:5560/isqlplus/dynamic?script=select%20*%20from%20emp_details_view;&type=text&action=load
```

Getting Help in *iSQL*Plus*

To access *iSQL*Plus* Online Help, click the Help icon. Help specific to *iSQL*Plus* is displayed in a new browser window. It is available in eight languages:

- Brazilian Portuguese
- French
- German
- Italian
- Japanese
- Korean
- Simplified Chinese
- Spanish

English is installed by default, and when the requested language is unavailable.

For more information about language support in *SQL*Plus*, see [Chapter 11, "SQL*Plus Globalization Support"](#).

Exiting SQL*Plus

The way you exit *SQL*Plus* from each of the three user interfaces is described in the following sections.

If you cannot log in to SQL*Plus because your username or password is invalid or for some other reason, SQL*Plus returns an error status equivalent to an EXIT FAILURE command. See the [EXIT](#) command on page 12-61 for further information.

Exiting the Command-line User Interface

When you are done working with SQL*Plus and wish to return to the operating system, enter EXIT or QUIT at the SQL*Plus prompt, or enter the end of file character, Ctrl+D on UNIX or Ctrl+Z on Windows.

SQL*Plus displays the version of Oracle Database from which you disconnected and the versions of tools available through SQL*Plus before you return to the operating system prompt.

Exiting the Windows Graphical User Interface

You can exit the Windows GUI in the same way as you exit the command-line user interface, enter EXIT or QUIT at the SQL*Plus prompt.

You can also click Exit in the File menu to exit the Windows GUI.

Exiting the iSQL*Plus User Interface

To exit iSQL*Plus, click the Logout icon.

To free up system and server resources, it is recommended that you always use the Logout icon to exit iSQL*Plus.

In iSQL*Plus, the EXIT or QUIT command halts the script currently running, it does not terminate your iSQL*Plus session.

SQLPLUS Program Syntax

You use the SQLPLUS command at the operating system prompt to start command-line SQL*Plus:

```
SQLPLUS [ Options ] [ Logon ] [ Start ]
```

where: *Options* has the following syntax:

```
-H[ELP] | -V[ERSION]
| [ [-C[OMPATIBILITY] {x.y[.z]} ] [-L[OGON]] [-M[ARKUP] markup_option]
  [-R[ESTRICT] {1|2|3}] [-S[ILENT]] ]
```

and *markup_option* has the following syntax:

```
HTML [ON|OFF] [HEAD text] [BODY text] [TABLE text] [ENTMAP {ON|OFF}]
[SPOOL {ON|OFF}] [PRE[FORMAT] {ON|OFF}]
```

where *Logon* has the following syntax:

```
{username[/password]@connect_identifier | / } [AS {SYSOPER|SYSDBA}]
|/NOLOG
```

where *Start* has the following syntax:

```
@{url|file_name[.ext]} [arg ...]
```

Warning: Including your password in plain text is a security risk. You can avoid this risk by omitting the password, and entering it only when the system prompts for it.

You have the option of entering logon. If you do not specify logon but do specify start, SQL*Plus assumes that the first line of the script contains a valid logon. If neither start nor logon are specified, SQL*Plus prompts for logon information.

Options

The following sections contain descriptions of SQLPLUS command options:

COMPATIBILITY Option

-C[OMPATIBILITY] {x.y[.z]}

Sets the value of the SQLPLUSCOMPATIBILITY system variable to the SQL*Plus release specified by x.y[.z]. Where x is the version number, y is the release number, and z is the update number. For example, 9.0.1 or 10.2. For more information, see the [SET SQLPLUSCOMPAT\[IBILITY\] {x.y\[.z\]}](#) on page 12-140system variable.

HELP Option

-H[ELP]

Displays the usage and syntax for the SQLPLUS command, and then returns control to the operating system.

VERSION Option

-V[ERSION]

Displays the current version and level number for SQL*Plus, and then returns control to the operating system.

LOGON Option

-L[OGON]

Specifies not to reprompt for username or password if the initial connection does not succeed. This can be useful in operating system scripts that must either succeed or fail and you don't want to be reprompted for connection details if the database server is not running. The -LOGON option is not supported in the Windows GUI.

MARKUP Options

-M[ARKUP]

You can use the MARKUP option to generate a complete stand alone web page from your query or script. MARKUP currently supports HTML 4.0 transitional.

Note: Depending on your operating system, the complete *markup_option* clause for the SQLPLUS command may need to be contained in quotes.

Use SQLPLUS -MARKUP HTML ON or SQLPLUS -MARKUP HTML ON SPOOL ON to produce standalone web pages. SQL*Plus will generate complete HTML pages

automatically encapsulated with <HTML> and <BODY> tags. The HTML tags in a spool file are closed when SPOOL OFF is executed or SQL*Plus exits.

The -SILENT and -RESTRICT command-line options may be useful when used in conjunction with -MARKUP.

You can use MARKUP HTML ON to produce HTML output in either the <PRE> tag or in an HTML table. Output to a table uses standard HTML <TABLE>, <TR> and <TD> tags to automatically encode the rows and columns resulting from a query. Output to an HTML table is the default behavior when the HTML option is set ON. You can generate output using HTML <PRE> tags by setting PREFORMAT ON.

In SQL*Plus, use the SHOW MARKUP command to view the status of MARKUP options.

The SQLPLUS -MARKUP command has the same options and functionality as the SET MARKUP command. These options are described in this section. For other information on the SET MARKUP command, see the [SET](#) command on page 12-89.

HTML [ON|OFF]

HTML is a mandatory MARKUP argument which specifies that the type of output to be generated is HTML. The optional HTML arguments, ON and OFF, specify whether or not to generate HTML output. The default is OFF.

MARKUP HTML ON generates HTML output using the specified MARKUP options.

You can turn HTML output ON and OFF as required during a session. The default is OFF.

HEAD *text*

The HEAD *text* option enables you to specify content for the <HEAD> tag. By default, *text* includes a default in-line cascading style sheet and title.

If *text* includes spaces, it must be enclosed in quotes. SQL*Plus does not test this free text entry for HTML validity. You must ensure that the text you enter is valid for the HTML <HEAD> tag. This gives you the flexibility to customize output for your browser or special needs.

BODY *text*

The BODY *text* option enables you to specify attributes for the <BODY> tag. By default, there are no attributes. If *text* includes spaces, it must be enclosed in quotes. SQL*Plus does not test this free text entry for HTML validity. You must ensure that the text you enter is valid for the HTML <BODY> tag. This gives you the flexibility to customize output for your browser or special needs.

TABLE *text*

The TABLE *text* option enables you to enter attributes for the <TABLE> tag. You can use TABLE *text* to set HTML <TABLE> tag attributes such as BORDER, CELLPADDING, CELLSPACING and WIDTH. By default, the <TABLE> WIDTH attribute is set to 90% and the BORDER attribute is set to 1.

If *text* includes spaces, it must be enclosed in quotes. SQL*Plus does not test this free text entry for HTML validity. You must ensure that the text you enter is valid for the HTML <TABLE> tag. This gives you the flexibility to customize output for your browser or special needs.

ENTMAP {ON|OFF}

ENTMAP ON or OFF specifies whether or not SQL*Plus replaces special characters <, >, " and & with the HTML entities <, >, " and & respectively. ENTMAP is set ON by default.

You can turn ENTMAP ON and OFF as required during a session. For example, with ENTMAP OFF, SQL*Plus screen output is:

```
SQL>PROMPT A > B
A > B
```

With ENTMAP ON, SQL*Plus screen output is:

```
SQL&gt; PROMPT A > B
A &gt; B
```

As entities in the <HEAD> and <BODY> tags are not mapped, you must ensure that valid entities are used in the MARKUP HEAD and BODY options.

If entities are not mapped, web browsers may treat data as invalid HTML and all subsequent output may display incorrectly. ENTMAP OFF enables users to write their own HTML tags to customize output.

Note: ENTMAP only takes effect when the HTML option is set ON. For more information about using entities in your output, see the [COLUMN](#) command on page 12-28.

SPOOL {ON|OFF}

SPOOL ON or OFF specifies whether or not SQL*Plus writes the HTML opening tags, <HTML> and <BODY>, and the closing tags, </BODY> and </HTML>, to the start and end of each file created by the SQL*Plus SPOOL filename command. The default is OFF.

You can turn SPOOL ON and OFF as required during a session.

Note: It is important to distinguish between the SET MARKUP HTML SPOOL option, and the SQLPLUS SPOOL *filename* command.

The SET MARKUP HTML SPOOL ON option enables the writing of the <HTML> tag to the spool file. The spool file is not created, and the header and footer tags enabled by the SET MARKUP HTML SPOOL ON option are not written to the spool file until you issue the SQLPLUS SPOOL *filename* command. See the [SPOOL](#) command on page 12-165 for more information.

SQL*Plus writes several HTML tags to the spool file when you issue the SPOOL filename command.

When you issue any of the SQL*Plus commands: EXIT, SPOOL OFF or SPOOL filename, SQL*Plus appends the following end tags and closes the file:

```
</BODY>
</HTML>
```

You can specify <HEAD> tag contents and <BODY> attributes using the HEAD and BODY options

PRE[FORMAT] {ON|OFF}

PREFORMAT ON or OFF specifies whether or not SQL*Plus writes output to the <PRE> tag or to an HTML table. The default is OFF, so output is written to a HTML table by default. You can turn PREFORMAT ON and OFF as required during a session.

Note: To produce report output using the HTML <PRE> tag, you must set PREFORMAT ON. For example:

```
SQLPLUS -M "HTML ON PREFORMAT ON"
```

or

```
SET MARKUP HTML ON PREFORMAT ON
```

MARKUP Usage Notes

When MARKUP HTML ON PREFORMAT OFF is used, commands originally intended to format paper reports have different meaning for reports intended for web tables:

- PAGESIZE is the number of rows in an HTML table, not the number of lines. Each row may contain multiple lines. The TTITLE, BTITLE and column headings are repeated every PAGESIZE rows.
- LINESIZE may have an effect on data if wrapping is on, or for very long data. Depending on data size, output may be generated on separate lines, which a browser may interpret as a space character.
- TTITLE and BTITLE content is output to three line positions: left, center and right, and the maximum line width is preset to 90% of the browser window. These elements may not align with the main output as expected due to the way they are handled for web output. Entity mapping in TTITLE and BTITLE is the same as the general ENTMAP setting specified in the MARKUP command.
- If you use a title in your output, then SQL*Plus starts a new HTML table for output rows that appear after the title. Your browser may format column widths of each table differently, depending on the width of data in each column.
- SET COLSEP, RECSEP and UNDERLINE only produce output in HTML reports when PREFORMAT is ON.

RESTRICT Option

-R[ESTRICT] {1|2|3}

Enables you to disable certain commands that interact with the operating system. This is similar to disabling the same commands in the Product User Profile (PUP) table. However, commands disabled with the -RESTRICT option are disabled even if there is no connection to a server, and remain disabled until SQL*Plus terminates.

If no -RESTRICT option is active, than all commands can be used, unless disabled in the PUP table.

If -RESTRICT 3 is used, then LOGIN.SQL is not read. GLOGIN.SQL is read but restricted commands used will fail.

Table 3-1 *Commands Disabled by Restriction Level*

Command	Level 1	Level 2	Level 3
EDIT	disabled	disabled	disabled
GET			disabled

Table 3–1 (Cont.) Commands Disabled by Restriction Level

Command	Level 1	Level 2	Level 3
HOST	disabled	disabled	disabled
SAVE		disabled	disabled
SPOOL		disabled	disabled
START, @, @@			disabled
STORE		disabled	disabled

SILENT Option`-S[ILENT]`

Suppresses all SQL*Plus information and prompt messages, including the command prompt, the echoing of commands, and the banner normally displayed when you start SQL*Plus. If you omit username or password, SQL*Plus prompts for them, but the prompts are not visible! Use SILENT to invoke SQL*Plus within another program so that the use of SQL*Plus is invisible to the user.

SILENT is a useful mode for creating reports for the web using the SQLPLUS -MARKUP command inside a CGI script or operating system script. The SQL*Plus banner and prompts are suppressed and do not appear in reports created using the SILENT option.

Logon`username[/password]`

Represent the username and password with which you wish to start SQL*Plus and connect to Oracle Database.

Warning: Including your password in plain text is a security risk. You can avoid this risk by omitting the password, and entering it only when the system prompts for it.

If you omit username and password, SQL*Plus prompts you for them. If you omit only password, SQL*Plus prompts for it. In silent mode, username and password prompts are not visible! Your username appears when you type it, but not your password.

`@connect_identifier`

Consists of an Oracle Net connect identifier. The exact syntax depends upon the Oracle Net configuration. For more information, refer to the Oracle Net manual or contact your DBA.

`/`

Represents a default logon using operating system authentication. You cannot enter a connect identifier if you use a default logon. In a default logon, SQL*Plus typically attempts to log you in using the username OPS\$name, where name is your operating system username. Note that the prefix "OPS\$" can be set to any other string of text. For example, you may wish to change the settings in your INIT.ORA parameters file to LOGONname or USERIDname. See the *Oracle Database Administrator's Guide* for information about operating system authentication.

`AS {SYSOPER|SYSDBA}`

The AS clause enables privileged connections by users who have been granted SYSOPER or SYSDBA system privileges.

/NOLOG

Establishes no initial connection to Oracle Database. Before issuing any SQL commands, you must issue a CONNECT command to establish a valid logon. Use /NOLOG when you want to have a SQL*Plus script prompt for the username, password, or database specification. The first line of this script is not assumed to contain a logon.

Start

@{url|file_name[.ext]} [arg ...]

Specifies the name of a script and arguments to run. The script can be called from the local file system or from a web server.

SQL*Plus passes the arguments to the script as if executing the file using the SQL*Plus START command. If no file suffix (file extension) is specified, the suffix defined by the SET SUFFIX command is used. The default suffix is .sql.

See the [START](#) command on page 12-167 for more information.

Part II

Using SQL*Plus

Part II helps you learn how to use SQL*Plus, how to tune SQL*Plus for better performance, how to restrict access to tables and commands and provides overviews of database administration tools and globalization support.

Part II contains the following chapters:

- [SQL*Plus Basics](#)
- [Using Scripts in SQL*Plus](#)
- [Formatting SQL*Plus Reports](#)
- [Generating HTML Reports from SQL*Plus](#)
- [Tuning SQL*Plus](#)
- [SQL*Plus Security](#)
- [Database Administration with SQL*Plus](#)
- [SQL*Plus Globalization Support](#)

SQL*Plus Basics

This chapter helps you learn the basics of using SQL*Plus. It has the following topics:

- [Entering and Executing Commands](#)
- [Listing a Table Definition](#)
- [Listing PL/SQL Definitions](#)
- [Running SQL Commands](#)
- [Running PL/SQL Blocks](#)
- [Running SQL*Plus Commands](#)
- [System Variables that Affect How Commands Run](#)
- [Stopping a Command while it is Running](#)
- [Running Operating System Commands](#)
- [Pausing the Display](#)
- [Saving Changes to the Database Automatically](#)
- [Interpreting Error Messages](#)

Entering and Executing Commands

Unless stated otherwise, descriptions of commands are applicable to all user interfaces.

In the command-line and Windows GUI, type commands at the SQL*Plus prompt and press Return to execute them.

In *iSQL*Plus*, type commands in the Workspace Input area and click Execute to execute them.

Usually, you separate the words in a command with a space or a tab. You can use additional spaces or tabs between words to make your commands more readable.

Case sensitivity is operating system specific. For the sake of clarity, all table names, column names, and commands in this guide appear in capital letters.

You can enter three kinds of commands:

- SQL commands, for working with information in the database
- PL/SQL blocks, also for working with information in the database
- SQL*Plus commands, for formatting query results, setting options, and editing and storing SQL commands and PL/SQL blocks

The manner in which you continue a command on additional lines, end a command, or execute a command differs depending on the type of command you wish to enter and run. Examples of how to run and execute these types of commands are found on the following pages.

In *iSQL*Plus*, the Input area of the Workspace is where you write, load, save and execute scripts. You can cut and paste statements in the Input area using your web browser's edit keys. You can also cut or copy scripts or statements from other applications, and paste them directly into the Input area. You can use the Save Script and Load Script buttons to save scripts from, and load scripts to the Input area. This may be useful when editing and testing.

In *iSQL*Plus*, you can enter multiple commands in the Input area, then click the Execute button to run them all sequentially.

*iSQL*Plus* script output can be:

- Displayed in the Workspace, below the Input area
- Displayed in a separate web browser window
- Saved to a file on your client machine

The SQL Buffer

The SQL buffer stores the most recently entered SQL command or PL/SQL block (but not *SQL*Plus* commands). The command or block remains in the buffer until replaced by the next SQL command or PL/SQL block. You can view the buffer contents with the LIST command.

You can execute the command or block in the SQL buffer using the RUN or /(slash) commands. RUN displays the command or block in the buffer before executing it. /(slash) executes the command or block in the buffer without displaying it first. For information about editing a command or block stored in the buffer see [Editing Scripts in *SQL*Plus* Command-Line](#) on page 5-2.

*SQL*Plus* does not store *SQL*Plus* commands, or the semicolon or slash characters you type to execute a command in the SQL buffer.

Executing Commands

In command-line *SQL*Plus*, you type a command and direct *SQL*Plus* to execute it by pressing the Return key. *SQL*Plus* processes the command and re-displays the command prompt when ready for another command.

In *iSQL*Plus*, you type a command or a script into the Input area and click the Execute button to execute the contents of the Input area. The results of your script are displayed below the Input area by default. Use the History screen to access and rerun commands previously executed in the current session.

*iSQL*Plus* executes the last SQL or PL/SQL statement even if it is incomplete or does not have a final ";" or "/". If you intend to run *iSQL*Plus* scripts in the command-line or Windows GUI, you should make sure you use a ";" or "/" to terminate your final statement.

*iSQL*Plus* retains the state of your current system variables and other options throughout your session. If you use the History screen to re-execute a script, you may get different results from those previously obtained, depending on the current system variable values.

Some SQL*Plus commands have no logical sense or are not applicable in iSQL*Plus. See [Appendix D, "Commands Not Supported in iSQL*Plus"](#)

Listing a Table Definition

To see the definitions of each column in a given table or view, use the SQL*Plus DESCRIBE command.

Example 4–1 Using the DESCRIBE Command

To list the column definitions of the columns in the sample view EMP_DETAILS_VIEW, enter

```
DESCRIBE EMP_DETAILS_VIEW
```

Name	Null?	Type
EMPLOYEE_ID	NOT NULL	NUMBER(6)
JOB_ID	NOT NULL	VARCHAR2(10)
MANAGER_ID		NUMBER(6)
DEPARTMENT_ID		NUMBER(4)
LOCATION_ID		NUMBER(4)
COUNTRY_ID		CHAR(2)
FIRST_NAME		VARCHAR2(20)
LAST_NAME	NOT NULL	VARCHAR2(25)
SALARY		NUMBER(8,2)
COMMISSION_PCT		NUMBER(2,2)
DEPARTMENT_NAME	NOT NULL	VARCHAR2(30)
JOB_TITLE	NOT NULL	VARCHAR2(35)
CITY	NOT NULL	VARCHAR2(30)
STATE_PROVINCE		VARCHAR2(25)
COUNTRY_NAME		VARCHAR2(40)
REGION_NAME		VARCHAR2(25)

Note: DESCRIBE accesses information in the Oracle Database data dictionary. You can also use SQL SELECT commands to access this and other information in the database. See your *Oracle Database SQL Reference* for details.

Listing PL/SQL Definitions

To see the definition of a function or procedure, use the SQL*Plus DESCRIBE command.

Example 4–2 Using the DESCRIBE Command

To create and list the definition of a function called AFUNC, enter

```
create or replace function afunc (f1 varchar2, f2 number) return number as
begin
  if (length(f1) > f2) then
    return 1;
  else
    return 0;
  end if;
end;
/
```

```
FUNCTION created.
```

```
DESCRIBE afunc
```

```
FUNCTION afunc RETURNS NUMBER
Argument Name      Type      In/Out  Default?
-----
F1                  VARCHAR2  IN
F2                  NUMBER    IN
```

Running SQL Commands

The SQL command language enables you to manipulate data in the database. See your *Oracle Database SQL Reference* for information on individual SQL commands.

Example 4-3 Entering a SQL Command

In this example, you will enter and execute a SQL command to display the employee number, name, job, and salary of each employee in the EMP_DETAILS_VIEW view.

1. At the command prompt, enter the first line of the command:

```
SELECT EMPLOYEE_ID, LAST_NAME, JOB_ID, SALARY
```

If you make a mistake, use Backspace to erase it and re-enter. When you are done, press Return to move to the next line.

2. SQL*Plus displays a "2", the prompt for the second line (not in *iSQL*Plus*). Enter the second line of the command:

```
FROM EMP_DETAILS_VIEW WHERE SALARY > 12000;
```

The semicolon (;) means that this is the end of the command. Press Return or click Execute. SQL*Plus processes the command and displays the results:

EMPLOYEE_ID	LAST_NAME	JOB_ID	SALARY
100	King	AD_PRES	\$24,000
101	Kochhar	AD_VP	\$17,000
102	De Haan	AD_VP	\$17,000
145	Russell	SA_MAN	\$14,000
146	Partners	SA_MAN	\$13,500
201	Hartstein	MK_MAN	\$13,000

6 rows selected.

After displaying the results and the number of rows retrieved, SQL*Plus command-line and Windows GUI display the command prompt again. If you made a mistake and therefore did not get the results shown, re-enter the command (or edit the command in the Input area in *iSQL*Plus*).

The headings may be repeated in your output, depending on the setting of a system variable called PAGESIZE. Sometimes, the result from a query will not fit the available page width. You can use the system variable, LINESIZE, to set the width of the output in characters. See [Setting Page Dimensions](#) on page 6-24. Typically, LINESIZE is set to 80 in command-line and Windows GUI, and 150 in *iSQL*Plus*. Whether you see the message stating the number of records retrieved

depends on the setting of the system variable, `FEEDBACK`. See [System Variables that Affect How Commands Run](#) on page 4-8 for more information.

Understanding SQL Command Syntax

Just as spoken language has syntax rules that govern the way we assemble words into sentences, SQL*Plus has syntax rules that govern how you assemble words into commands. You must follow these rules if you want SQL*Plus to accept and execute your commands.

Dividing a SQL Command into Separate Lines

You can divide your SQL command into separate lines at any points you wish, as long as individual words are not split. Thus, you can enter the query you entered in [Example 4-3, "Entering a SQL Command"](#) on three lines:

```
SELECT EMPLOYEE_ID, LAST_NAME, JOB_ID
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000;
```

In this guide, you will find most SQL commands divided into clauses, one clause on each line. In [Example 4-3, "Entering a SQL Command"](#), for instance, the `SELECT` and `FROM` clauses were placed on separate lines. Many people find this clearly visible structure helpful, but you may choose whatever line division makes commands most readable to you.

Ending a SQL Command

You can end a SQL command in one of three ways:

- with a semicolon (;)
- with a slash (/) on a line by itself
- with a blank line

A semicolon (;) tells SQL*Plus that you want to run the command. Type the semicolon at the end of the last line of the command, as shown in [Example 4-3, "Entering a SQL Command"](#), and press Return or click Execute. SQL*Plus processes the command and also stores the command in the SQL buffer. See [The SQL Buffer](#) on page 4-2 for details. If you mistakenly press Return before typing the semicolon, SQL*Plus prompts you with a line number for the next line of your command (not in *iSQL*Plus*). Type the semicolon and press Return again or click Execute to run the command.

A slash (/) on a line by itself also tells SQL*Plus that you wish to run the command. Press Return at the end of the last line of the command. SQL*Plus prompts you with another line number (not in *iSQL*Plus*). Type a slash and press Return again or click Execute. SQL*Plus executes the command and stores it in the buffer.

A blank line in a SQL statement or script tells SQL*Plus that you have finished entering the command, but do not want to run it yet. Press Return at the end of the last line of the command. SQL*Plus prompts you with another line number (not in *iSQL*Plus*).

Note: You can change the way blank lines appear and behave in SQL statements using the `SET SQLBLANKLINES` command (not in *iSQL*Plus*). For more information about changing blank line behavior, see the [SET](#) command on page 12-89.

To execute commands this way, press Return again; SQL*Plus now prompts you with the SQL*Plus command prompt (not in *i*SQL*Plus). SQL*Plus does not execute the command, but stores it in the SQL buffer. See [The SQL Buffer](#) on page 4-2 for details. If you subsequently enter another SQL command, SQL*Plus overwrites the previous command in the buffer.

Running PL/SQL Blocks

You can also use PL/SQL subprograms (called blocks) to manipulate data in the database. See your *Oracle Database PL/SQL User's Guide and Reference* for information on individual PL/SQL statements.

SQL*Plus treats PL/SQL subprograms in the same manner as SQL commands, except that a semicolon (;) or a blank line does not terminate and execute a block. Terminate PL/SQL subprograms by entering a period (.) by itself on a new line. You can also terminate and execute a PL/SQL subprogram by entering a slash (/) by itself on a new line.

You enter the mode for entering PL/SQL statements when:

- You type DECLARE or BEGIN. After you enter PL/SQL mode in this way, type the remainder of your PL/SQL subprogram.
- You type a SQL command (such as CREATE PROCEDURE) that creates a stored procedure. After you enter PL/SQL mode in this way, type the stored procedure you want to create.

SQL*Plus stores the subprograms you enter in the SQL buffer. Execute the current subprogram with a RUN or slash (/) command. A semicolon (;) is treated as part of the PL/SQL subprogram and will not execute the command.

SQL*Plus sends the complete PL/SQL subprogram to Oracle Database for processing (as it does SQL commands). See your *Oracle Database PL/SQL User's Guide and Reference* for more information.

You might enter and execute a PL/SQL subprogram as follows:

```
DECLARE
  x NUMBER := 100;
BEGIN
  FOR i IN 1..10 LOOP
    IF MOD (i, 2) = 0 THEN    --i is even
      INSERT INTO temp VALUES (i, x, 'i is even');
    ELSE
      INSERT INTO temp VALUES (i, x, 'i is odd');
    END IF;
    x := x + 100;
  END LOOP;
END;
.
```

Creating Stored Procedures

Stored procedures are PL/SQL functions, packages, or procedures. To create stored procedures, you use the following SQL CREATE commands:

- CREATE FUNCTION
- CREATE LIBRARY
- CREATE PACKAGE

- CREATE PACKAGE BODY
- CREATE PROCEDURE
- CREATE TRIGGER
- CREATE TYPE

Entering any of these commands places you in PL/SQL mode, where you can enter your PL/SQL subprogram. For more information, see [Running PL/SQL Blocks](#) on page 4-6. When you are done typing your PL/SQL subprogram, enter a period (.) on a line by itself to terminate PL/SQL mode. To run the SQL command and create the stored procedure, you must enter RUN or slash (/). A semicolon (;) will not execute these CREATE commands.

When you use CREATE to create a stored procedure, a message appears if there are compilation errors. To view these errors, you use SHOW ERRORS. For example:

```
SHOW ERRORS PROCEDURE ASSIGNVL
```

See [SHOW](#) on page 12-159 for more information.

To execute a PL/SQL statement that references a stored procedure, you can use the SQL*Plus EXECUTE command. EXECUTE runs the PL/SQL statement that you enter immediately after the command. For example:

```
EXECUTE EMPLOYEE_MANAGEMENT.NEW_EMP ( 'BLAKE' )
```

See [EXECUTE](#) on page 12-60 for more information.

Running SQL*Plus Commands

You can use SQL*Plus commands to manipulate SQL commands and PL/SQL blocks and to format and print query results. SQL*Plus treats SQL*Plus commands differently than SQL commands or PL/SQL blocks.

To speed up command entry, you can abbreviate many SQL*Plus commands. For information on and abbreviations of all SQL*Plus commands, see [Chapter 12, "SQL*Plus Command Reference"](#).

Example 4-4 Entering a SQL*Plus Command (not in iSQL*Plus)

This example shows how you might enter a SQL*Plus command to change the format used to display the column SALARY of the sample view, EMP_DETAILS_VIEW.

1. Enter this SQL*Plus command:

```
COLUMN SALARY FORMAT $99,999 HEADING 'MONTHLY SALARY'
```

If you make a mistake, use Backspace to erase it and re-enter. When you have entered the line, press Return. SQL*Plus notes the new format and displays the SQL*Plus command prompt again, ready for a new command.

2. Enter the following query and press Return, or click Execute in iSQL*Plus to run it:

```
SELECT EMPLOYEE_ID, LAST_NAME, JOB_ID, SALARY
FROM EMP_DETAILS_VIEW WHERE SALARY > 12000;
```

EMPLOYEE_ID	LAST_NAME	JOB_ID	MONTHLY SALARY
100	King	AD_PRES	\$24,000
101	Kochhar	AD_VP	\$17,000
102	De Haan	AD_VP	\$17,000
145	Russell	SA_MAN	\$14,000
146	Partners	SA_MAN	\$13,500
201	Hartstein	MK_MAN	\$13,000

6 rows selected.

The COLUMN command formatted the column SALARY with a dollar sign (\$) and a comma (,) and gave it a new heading.

Understanding SQL*Plus Command Syntax

SQL*Plus commands have a different syntax from SQL commands or PL/SQL blocks.

You do not need to end a SQL*Plus command with a semicolon. When you finish entering the command, you can just press Return or click Execute. There is no need to end a SQL*Plus command with a semicolon.

Continuing a Long SQL*Plus Command on Additional Lines

You can continue a long SQL*Plus command by typing a hyphen at the end of the line and pressing Return. If you wish, you can type a space before typing the hyphen. SQL*Plus displays a right angle-bracket (>) as a prompt for each additional line (not in iSQL*Plus).

For example:

```
COLUMN SALARY FORMAT $99,999 -
HEADING 'MONTHLY SALARY'
```

Since SQL*Plus identifies the hyphen as a continuation character, entering a hyphen within a SQL statement is ignored by SQL*Plus. SQL*Plus does not identify the statement as a SQL statement until after the input processing has joined the lines together and removed the hyphen. For example, entering the following:

```
SELECT 200 -
100 FROM DUAL;
```

returns the error:

```
SELECT 200 100 FROM DUAL
          *
ERROR at line 1:
ORA-00923: FROM keyword not found where expected
```

To ensure that the statement is interpreted correctly, reposition the hyphen from the end of the first line to the beginning of the second line.

System Variables that Affect How Commands Run

The SQL*Plus SET command controls many variables—called SET variables or system variables—which affect the way SQL*Plus runs your commands. System variables control a variety of conditions within SQL*Plus, including default column widths for

your output, whether SQL*Plus displays the number of records selected by a command, and your page size.

The examples in this guide are based on running SQL*Plus with the system variables at their default settings. Depending on the settings of your system variables, your output may appear slightly different than the output shown in the examples. (Your settings might differ from the default settings if you have a SQL*Plus LOGIN file on your computer.)

See the [SET](#) command on page 12-89 for more information on system variables and their default settings. See [SQL*Plus and iSQL*Plus Configuration](#) on page 2-4 and [SQLPLUS Program Syntax](#) on page 3-13 for details on the SQL*Plus LOGIN file.

To list the current setting of a system variable, enter SHOW followed by the variable name. See the [SHOW](#) command on page 12-159 for information on other items you can list with SHOW.

Stopping a Command while it is Running

Suppose you have displayed the first page of a 50 page report and decide you do not need to see the rest of it. Press Cancel, the system's interrupt character, which is usually CTRL+C. SQL*Plus stops the display. In iSQL*Plus, click the Cancel button.

Note: Pressing Cancel does not stop the printing of a file that you have sent to a printer with the OUT clause of the SQL*Plus SPOOL command. (You will learn about printing query results in [Chapter 6, "Formatting SQL*Plus Reports"](#).) You can stop the printing of a file through your operating system. For more information, see your operating system's installation and user's guide.

Running Operating System Commands

You can execute an operating system command from the SQL*Plus command prompt. This is useful when you want to perform a task such as listing existing operating system files.

To run an operating system command, enter the SQL*Plus command HOST followed by the operating system command. For example, this SQL*Plus command runs the command, DIRECTORY *.SQL:

```
HOST DIRECTORY *.SQL
```

When the command finishes running, the SQL*Plus command prompt appears again.

Note: Operating system commands entered from a SQL*Plus session using the HOST command do not affect the current SQL*Plus session. For example, setting an operating system environment variable does not affect the current SQL*Plus session, but may affect SQL*Plus sessions started subsequently.

You can suppress access to the HOST command. For more information about suppressing the HOST command see [Chapter 9, "SQL*Plus Security"](#).

Pausing the Display

You can use the PAUSE system variable to stop and examine the contents of the screen after each page during the display of a long report, or during the display of a table definition with many columns. After examining the display, you can press Return, or click Next in *iSQL*Plus*, to continue.

You can use SET PAUSE to pause output after displaying each screen of a query or report. See [SET PAU\[SE\] {ON | OFF | text}](#) on page 12-129 for more information.

Saving Changes to the Database Automatically

You can specify changes you wish to make to the information stored in the database using the SQL Database Manipulation Language (DML) commands UPDATE, INSERT, and DELETE—which can be used independently or within a PL/SQL block. These changes are not made permanent until you enter a SQL COMMIT command or a SQL Database Control Language (DCL) or Database Definition Language (DDL) command (such as CREATE TABLE), or use the autocommit feature. The SQL*Plus autocommit feature causes pending changes to be committed after a specified number of successful SQL DML transactions. (A SQL DML transaction is either an UPDATE, INSERT, or DELETE command, or a PL/SQL block.)

You control the autocommit feature with the SQL*Plus AUTOCOMMIT system variable. Regardless of the AUTOCOMMIT setting, changes are committed when you exit SQL*Plus successfully.

Example 4-5 Turning Autocommit On

To turn the autocommit feature on, enter

```
SET AUTOCOMMIT ON
```

Alternatively, you can enter the following to turn the autocommit feature on:

```
SET AUTOCOMMIT IMMEDIATE
```

Until you change the setting of AUTOCOMMIT, SQL*Plus automatically commits changes from each SQL DML command that specifies changes to the database. After each autocommit, SQL*Plus displays the following message:

```
COMMIT COMPLETE
```

When the autocommit feature is turned on, you cannot roll back changes to the database.

To commit changes to the database after a number of SQL DML commands, for example, 10, enter

```
SET AUTOCOMMIT 10
```

SQL*Plus counts SQL DML commands as they are executed and commits the changes after each 10th SQL DML command.

Note: For this feature, a PL/SQL block is regarded as one transaction, regardless of the actual number of SQL commands contained within it.

To turn the autocommit feature off again, enter the following command:

```
SET AUTOCOMMIT OFF
```

To confirm that AUTOCOMMIT is now set to OFF, enter the following SHOW command:

```
SHOW AUTOCOMMIT
```

```
AUTOCOMMIT OFF
```

See [SET AUTO\[COMMIT\]{ON | OFF | IMM\[EDIATE\] | n}](#) on page 12-95 for more information.

Interpreting Error Messages

If SQL*Plus detects an error in a command, it displays an error message. See [Chapter 13, "SQL*Plus Error Messages"](#) for a list of SQL*Plus error messages.

Example 4-6 Interpreting an Error Message

If you attempt to execute a file that does not exist or is unavailable by entering:

```
START EMPLOYEE.SQL
```

An error message indicates that the table does not exist:

```
SP2-0310: unable to open file "employee.sql"
```

You will often be able to figure out how to correct the problem from the message alone. If you need further explanation, take one of the following steps to determine the cause of the problem and how to correct it:

- If the error is a numbered error beginning with the letters "SP2", look up the SQL*Plus message in [SQL*Plus Error Messages](#) on page 13-1.
- If the error is a numbered error beginning with the letters "CPY" look up the SQL*Plus COPY command message in [COPY Command Messages](#) on page 13-39.
- If the error is a numbered error beginning with the letters "ORA", look up the Oracle Database message in the *Oracle Database Error Messages* guide or in the platform-specific Oracle documentation provided for your operating system.
- If the error is a numbered error beginning with the letters "PLS", look up the Oracle Database message in the *Oracle Database PL/SQL User's Guide and Reference*.

If the error is unnumbered, look up correct syntax for the command that generated the error in [Chapter 12, "SQL*Plus Command Reference"](#) for a SQL*Plus command, in the *Oracle Database SQL Reference* for a SQL command, or in the *Oracle Database PL/SQL User's Guide and Reference* for a PL/SQL block. Otherwise, contact your DBA.

Using Scripts in SQL*Plus

This chapter helps you learn to write and edit scripts containing SQL*Plus commands, SQL commands, and PL/SQL blocks. It covers the following topics:

- [Editing Scripts](#)
- [Editing Scripts in SQL*Plus Command-Line](#)
- [Placing Comments in Scripts](#)
- [Running Scripts](#)
- [Nesting Scripts](#)
- [Exiting from a Script with a Return Code](#)
- [Defining Substitution Variables](#)
- [Using Predefined Variables](#)
- [Using Substitution Variables](#)
- [Substitution Variables in iSQL*Plus](#)
- [Passing Parameters through the START Command](#)
- [Communicating with the User](#)
- [Using Bind Variables](#)
- [Using REFCURSOR Bind Variables](#)

Read this chapter while sitting at your computer and try out the examples shown. Before beginning, make sure you have access to the sample schema described in [SQL*Plus Overview](#) on page xix.

Editing Scripts

In the command-line and Windows GUI, the use of an external editor in combination with the @, @@ or START commands is an effective method of creating and executing generic scripts. You can write scripts which contain SQL*Plus, SQL and PL/SQL commands, which you can retrieve and edit. This is especially useful for storing complex commands or frequently used reports.

Writing Scripts with a System Editor

Your operating system may have one or more text editors that you can use to write scripts. You can run your operating system's default text editor without leaving SQL*Plus command-line or Windows GUI by entering the EDIT command.

You can use the SQL*Plus DEFINE command to define the variable, `_EDITOR`, to hold the name of your preferred text editor. For example, to define the editor used by EDIT to be vi, enter the following command:

```
DEFINE _EDITOR = vi
```

You can include an editor definition in your user or site profile so that it is always enabled when you start SQL*Plus. See [SQL*Plus and iSQL*Plus Configuration](#) on page 2-4, the [DEFINE](#) command on page 12-44, and the [EDIT](#) command on page 12-58 for more information.

To create a script with a text editor, enter EDIT followed by the name of the file to edit or create, for example:

```
EDIT SALES
```

EDIT adds the filename extension `.SQL` to the name unless you specify the file extension. When you save the script with the text editor, it is saved back into the same file. EDIT lets you create or modify scripts.

You must include a semicolon at the end of each SQL command and a slash (/) on a line by itself after each PL/SQL block in the file. You can include multiple SQL commands and PL/SQL blocks in a script.

Example 5-1 Using a System Editor to Write a SQL Script

Suppose you have composed a query to display a list of salespeople and their commissions. You plan to run it once a month to keep track of how well each employee is doing.

To compose and save the query using your system editor, invoke your editor and create a file to hold your script:

```
EDIT SALES
```

Enter each of the following lines in your editor. Do not forget to include the semicolon at the end of the SQL statement:

```
COLUMN LAST_NAME HEADING 'LAST NAME'
COLUMN SALARY HEADING 'MONTHLY SALARY' FORMAT $99,999
COLUMN COMMISSION_PCT HEADING 'COMMISSION %' FORMAT 90.90
SELECT LAST_NAME, SALARY, COMMISSION_PCT
FROM EMP_DETAILS_VIEW
WHERE JOB_ID='SA_MAN';
```

The format model for the column `COMMISSION_PCT` tells SQL*Plus to display an initial zero for decimal values, and a zero instead of a blank when the value of `COMMISSION_PCT` is zero for a given row. Format models and the `COLUMN` command are described in more detail in the [COLUMN](#) command on page 12-28 and in the *Oracle Database SQL Reference*.

Now use your editor's save command to store your query in a file called `SALES.SQL`.

Editing Scripts in SQL*Plus Command-Line

You can use a number of SQL*Plus commands to edit the SQL command or PL/SQL block currently stored in the buffer.

[Table 5-1, "SQL*Plus Editing Commands"](#) lists the SQL*Plus commands that allow you to examine or change the command in the buffer without re-entering the command.

Table 5–1 SQL*Plus Editing Commands

Command	Abbreviation	Purpose
APPEND <i>text</i>	A <i>text</i>	adds <i>text</i> at the end of the current line
CHANGE/ <i>old/new</i>	C/ <i>old/new</i>	changes <i>old</i> to <i>new</i> in the current line
CHANGE/ <i>text</i>	C/ <i>text</i>	deletes <i>text</i> from the current line
CLEAR BUFFER	CL BUFF	deletes all lines
DEL	(none)	deletes the current line
DEL <i>n</i>	(none)	deletes line <i>n</i>
DEL *	(none)	deletes the current line
DEL <i>n</i> *	(none)	deletes line <i>n</i> through the current line
DEL LAST	(none)	deletes the last line
DEL <i>m n</i>	(none)	deletes a range of lines (<i>m</i> to <i>n</i>)
DEL * <i>n</i>	(none)	deletes the current line through line <i>n</i>
INPUT	I	adds one or more lines
INPUT <i>text</i>	I <i>text</i>	adds a line consisting of <i>text</i>
LIST	; or L	lists all lines in the SQL buffer
LIST <i>n</i>	L <i>n</i> or <i>n</i>	lists line <i>n</i>
LIST *	L *	lists the current line
LIST <i>n</i> *	L <i>n</i> *	lists line <i>n</i> through the current line
LIST LAST	L LAST	lists the last line
LIST <i>m n</i>	L <i>m n</i>	lists a range of lines (<i>m</i> to <i>n</i>)
LIST * <i>n</i>	L * <i>n</i>	lists the current line through line <i>n</i>

These are useful if you want to correct or modify a command you have entered.

Listing the Buffer Contents

The SQL buffer contains the last SQL or PL/SQL command. Any editing command other than LIST and DEL affects only a single line in the buffer. This line is called the current line. It is marked with an asterisk when you list the current command or block.

Example 5–2 Listing the Buffer Contents

Suppose you want to list the current command. Use the LIST command as shown. (If you have exited SQL*Plus or entered another SQL command or PL/SQL block since following the steps in [Example 4–3, "Entering a SQL Command"](#), perform the steps in that example again before continuing.)

```
LIST
```

```
SELECT EMPLOYEE_ID, LAST_NAME, JOB_ID, SALARY
2 FROM EMP_DETAILS_VIEW
3* WHERE SALARY>12000
```

Notice that the semicolon you entered at the end of the SELECT command is not listed. This semicolon is necessary to indicate the end of the command when you enter

it, but it is not part of the SQL command and SQL*Plus does not store it in the SQL buffer.

Editing the Current Line

The SQL*Plus CHANGE command enables you to edit the current line. Various actions determine which line is the current line:

- LIST a given line to make it the current line.
- When you LIST or RUN the command in the buffer, the last line of the command becomes the current line. (Note, that using the slash (/) command to run the command in the buffer does not affect the current line.)
- If you get an error, the error line automatically becomes the current line.

Example 5-3 Making an Error in Command Entry

Suppose you try to select the JOB_ID column but mistakenly enter it as JO_ID. Enter the following command, purposely misspelling JOB_ID in the first line:

```
SELECT EMPLOYEE_ID, LAST_NAME, JO_ID, SALARY
FROM EMP_DETAILS_VIEW
WHERE JOB_ID='SA_MAN';
```

You see this message on your screen:

```
SELECT EMPLOYEE_ID, LAST_NAME, JO_ID, SALARY
                                *
ERROR at line 1:
ORA-00904: invalid column name
```

Examine the error message; it indicates an invalid column name in line 1 of the query. The asterisk shows the point of error—the mis-typed column JOB_ID.

Instead of re-entering the entire command, you can correct the mistake by editing the command in the buffer. The line containing the error is now the current line. Use the CHANGE command to correct the mistake. This command has three parts, separated by slashes or any other non-alphanumeric character:

- the word CHANGE or the letter C
- the sequence of characters you want to change
- the replacement sequence of characters

The CHANGE command finds the first occurrence in the current line of the character sequence to be changed and changes it to the new sequence. You do not need to use the CHANGE command to re-enter an entire line.

Example 5-4 Correcting the Error

To change JO_ID to JOB_ID, change the line with the CHANGE command:

```
CHANGE /JO_ID/JOB_ID
```

The corrected line appears on your screen:

```
1* SELECT EMPLOYEE_ID, FIRST_NAME, JOB_ID, SALARY
```

Now that you have corrected the error, you can use the RUN command to run the command again:

```
RUN
```

SQL*Plus correctly displays the query and its result:

```

1 SELECT EMPLOYEE_ID, LAST_NAME, JOB_ID, SALARY
2 FROM EMP_DETAILS_VIEW
3* WHERE JOB_ID='SA_MAN'
```

EMPLOYEE_ID	LAST_NAME	JOB_ID	MONTHLY SALARY
145	Russell	SA_MAN	\$14,000
146	Partners	SA_MAN	\$13,500
147	Errazuriz	SA_MAN	\$12,000
148	Cambrault	SA_MAN	\$11,000
149	Zlotkey	SA_MAN	\$10,500

Note that the column SALARY retains the format you gave it in [Example 4-4, "Entering a SQL*Plus Command \(not in iSQL*Plus\)"](#). (If you have left SQL*Plus and started again since performing [Example 4-4, "Entering a SQL*Plus Command \(not in iSQL*Plus\)"](#) the column has reverted to its original format.)

See [CHANGE](#) on page 12-24 for information about the significance of case in a CHANGE command and on using wildcards to specify blocks of text in a CHANGE command.

Appending Text to a Line

To add text to the end of a line in the buffer, use the APPEND command.

1. Use the LIST command (or the line number) to list the line you want to change.
2. Enter APPEND followed by the text you want to add. If the text you want to add begins with a blank, separate the word APPEND from the first character of the text by two blanks: one to separate APPEND from the text, and one to go into the buffer with the text.

Example 5-5 Appending Text to a Line

To append a space and the clause DESC to line 4 of the current query, first list line 4:

```
LIST 4
```

```
4* ORDER BY SALARY
```

Next, enter the following command (be sure to type two spaces between APPEND and DESC):

```
APPEND  DESC
```

```
4* ORDER BY SALARY DESC
```

Type RUN to verify the query:

```

1 SELECT EMPLOYEE_ID, LAST_NAME, JOB_ID, SALARY
2 FROM EMP_DETAILS_VIEW
3 WHERE JOB_ID='SA_MAN'
4* ORDER BY SALARY DESC

```

EMPLOYEE_ID	LAST_NAME	JOB_ID	MONTHLY SALARY
145	Russell	SA_MAN	\$14,000
146	Partners	SA_MAN	\$13,500
147	Errazuriz	SA_MAN	\$12,000
148	Cambrault	SA_MAN	\$11,000
149	Zlotkey	SA_MAN	\$10,500

Adding a New Line

To insert a new line after the current line, use the INPUT command.

To insert a line before line 1, enter a zero ("0") and follow the zero with text. SQL*Plus inserts the line at the beginning of the buffer and all lines are renumbered starting at 1.

```
0 SELECT EMPLOYEE_ID
```

Example 5-6 Adding a Line

Suppose you want to add a fourth line to the SQL command you modified in [Example 5-4, "Correcting the Error"](#). Since line 3 is already the current line, enter INPUT and press Return.

```
INPUT
```

SQL*Plus prompts you for the new line:

```
4
```

Enter the new line. Then press Return.

```
4 ORDER BY SALARY
```

SQL*Plus prompts you again for a new line:

```
5
```

Press Return again to indicate that you will not enter any more lines, and then use RUN to verify and re-run the query.

```

1 SELECT EMPLOYEE_ID, LAST_NAME, JOB_ID, SALARY
2 FROM EMP_DETAILS_VIEW
3 WHERE JOB_ID='SA_MAN'
4* ORDER BY SALARY

```

EMPLOYEE_ID	LAST_NAME	JOB_ID	MONTHLY SALARY
149	Zlotkey	SA_MAN	\$10,500
148	Cambrault	SA_MAN	\$11,000
147	Errazuriz	SA_MAN	\$12,000
146	Partners	SA_MAN	\$13,500
145	Russell	SA_MAN	\$14,000

Deleting Lines

Use the DEL command to delete lines in the buffer. Enter DEL specifying the line numbers you want to delete.

Suppose you want to delete the current line to the last line inclusive. Use the DEL command as shown.

```
DEL * LAST
```

DEL makes the following line of the buffer (if any) the current line.

See [DEL](#) on page 12-49 for more information.

Placing Comments in Scripts

You can enter comments in a script in three ways:

- using the SQL*Plus REMARK command for single line comments.
- using the SQL comment delimiters /*...*/ for single or multi line comments.
- using ANSI/ISO (American National Standards Institute/International Standards Organization) comments -- for single line comments.

Comments entered at the command-line are not stored in the SQL buffer.

Using the REMARK Command

Use the REMARK command on a line by itself in a script, followed by comments on the same line. To continue the comments on additional lines, enter additional REMARK commands. Do not place a REMARK command between different lines of a single SQL command.

```
REMARK Commission Report;
REMARK to be run monthly.;
COLUMN LAST_NAME HEADING 'LAST_NAME';
COLUMN SALARY HEADING 'MONTHLY SALARY' FORMAT $99,999;
COLUMN COMMISSION_PCT HEADING 'COMMISSION %' FORMAT 90.90;
REMARK Includes only salesmen;
SELECT LAST_NAME, SALARY, COMMISSION_PCT
FROM EMP_DETAILS_VIEW
WHERE JOB_ID='SA_MAN';
```

Using /*...*/

Enter the SQL comment delimiters, /*...*/, on separate lines in your script, on the same line as a SQL command, or on a line in a PL/SQL block.

You must enter a space after the slash-asterisk(/*) beginning a comment.

The comments can span multiple lines, but cannot be nested within one another:

```
/* Commission Report
to be run monthly. */
COLUMN LAST_NAME HEADING 'LAST_NAME';
COLUMN SALARY HEADING 'MONTHLY SALARY' FORMAT $99,999;
COLUMN COMMISSION_PCT HEADING 'COMMISSION %' FORMAT 90.90;
REMARK Includes only salesmen;
SELECT LAST_NAME, SALARY, COMMISSION_PCT
FROM EMP_DETAILS_VIEW
/* Include only salesmen.*/
WHERE JOB_ID='SA_MAN';
```

Using --

You can use ANSI/ISO "--" style comments within SQL statements, PL/SQL blocks, or SQL*Plus commands. Since there is no ending delimiter, the comment cannot span multiple lines.

For PL/SQL and SQL, enter the comment after a command on a line, or on a line by itself:

```
-- Commissions report to be run monthly  
DECLARE --block for reporting monthly sales
```

For SQL*Plus commands, you can only include "--" style comments if they are on a line by themselves. For example, these comments are legal:

```
-- set maximum width for LONG to 777  
SET LONG 777
```

This comment is illegal:

```
SET LONG 777 -- set maximum width for LONG to 777
```

If you enter the following SQL*Plus command, SQL*Plus interprets it as a comment and does not execute the command:

```
-- SET LONG 777
```

Notes on Placing Comments

SQL*Plus does not have a SQL or PL/SQL command parser. It scans the first few keywords of each new statement to determine the command type, SQL, PL/SQL or SQL*Plus. Comments in some locations can prevent SQL*Plus from correctly identifying the command type, giving unexpected results. The following usage notes may help you to use SQL*Plus comments more effectively:

1. Do not put comments within the first few keywords of a statement. For example:

```
CREATE OR REPLACE  
2  /* HELLO */  
3  PROCEDURE HELLO AS  
4  BEGIN  
5  DBMS_OUTPUT.PUT_LINE('HELLO');  
6  END;  
7  /
```

Warning: Procedure created with compilation errors.

The location of the comment prevents SQL*Plus from recognizing the command as a command. SQL*Plus submits the PL/SQL block to the server when it sees the slash "/" at the beginning of the comment, which it interprets as the "/" statement terminator. Move the comment to avoid this error. For example:

```
CREATE OR REPLACE PROCEDURE  
2  /* HELLO */  
3  HELLO AS  
4  BEGIN  
5  DBMS_OUTPUT.PUT_LINE('HELLO');  
6  END;  
7  /
```

Procedure created.

- Do not put comments after statement terminators (period, semicolon or slash). For example, if you enter:

```
SELECT 'Y' FROM DUAL; -- TESTING
```

You get the following error:

```
SELECT 'Y' FROM DUAL; -- TESTING
                        *
ERROR at line 1:
ORA-00911: invalid character
```

SQL*Plus expects no text after a statement terminator and is unable to process the command.

- Do not put statement termination characters at the end of a comment line or after comments in a SQL statement or a PL/SQL block. For example, if you enter:

```
SELECT *
-- COMMENT;
```

You get the following error:

```
-- COMMENT
      *
ERROR at line 2:
ORA-00923: FROM keyword not found where expected
```

The semicolon is interpreted as a statement terminator and SQL*Plus submits the partially formed SQL command to the server for processing, resulting in an error.

- Do not use ampersand characters '&' in comments in a SQL statement or PL/SQL block. For example, if you enter a script such as:

```
SELECT REGION_NAME, CITY
/* THIS & THAT */
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000;
```

SQL*Plus interprets text after the ampersand character "&" as a substitution variable and prompts for the value of the variable, &that:

```
Enter value for that:
old  2: /* THIS & THAT */
new  2: /* THIS  */

REGION_NAME          CITY
-----
Americas             Seattle
Americas             Seattle
Americas             Seattle
Europe               Oxford
Europe               Oxford
Americas             Toronto
6 rows selected.
```

You can SET DEFINE OFF to prevent scanning for the substitution character.

For more information on substitution and termination characters, see DEFINE, SQLTERMINATOR and SQLBLANKLINES in the SET command on page 12-89.

Running Scripts

The START command retrieves a script and runs the commands it contains. Use START to run a script containing SQL commands, PL/SQL blocks, and SQL*Plus commands. You can have many commands in the file. Follow the START command with the name of the file:

```
START file_name
```

SQL*Plus assumes the file has a .SQL extension by default.

Example 5-7 Running a Script

To retrieve and run the command stored in SALES.SQL, enter

```
START SALES
```

SQL*Plus runs the commands in the file SALES and displays the results of the commands on your screen, formatting the query results according to the SQL*Plus commands in the file:

LAST NAME	MONTHLY SALARY	COMMISSION %
Russell	\$14,000	0.40
Partners	\$13,500	0.30
Errazuriz	\$12,000	0.30
Cambrault	\$11,000	0.30
Zlotkey	\$10,500	0.20

You can also use the @ ("at" sign) command to run a script:

```
@SALES
```

The @ and @@ commands list and run the commands in the specified script in the same manner as START. SET ECHO affects the @ and @@ commands in the same way as it affects the START command.

To see the commands as SQL*Plus "enters" them, you can SET ECHO ON. The ECHO system variable controls the listing of the commands in scripts run with the START, @ and @@ commands. Setting the ECHO variable OFF suppresses the listing.

START, @ and @@ leave the last SQL command or PL/SQL block of the script in the buffer.

Running a Script as You Start SQL*Plus

To run a script as you start SQL*Plus, use one of the following options:

- Follow the SQLPLUS command with your username, a slash, a space, @, and the name of the file:

```
SQLPLUS HR @SALES
```

SQL*Plus starts, prompts for your password and runs the script.

- Include your username as the first line of the file. Follow the SQLPLUS command with @ and the filename. SQL*Plus starts, prompts for your password and runs the file.

Nesting Scripts

To run a series of scripts in sequence, first create a script containing several START commands, each followed by the name of a script in the sequence. Then run the script containing the START commands. For example, you could include the following START commands in a script named SALESRPT:

```
START Q1SALES
START Q2SALES
START Q3SALES
START Q4SALES
START YRENDSLS
```

Note: The @@ command may be useful in this example. See the @@ (double "at" sign) command on page 12-7 for more information.

Exiting from a Script with a Return Code

You can include an EXIT command in a script to return a value when the script finishes. See the EXIT command on page 12-61 for more information.

You can include a WHENEVER SQLERROR command in a script to automatically exit SQL*Plus with a return code should your script generate a SQL error. Similarly, you can include a WHENEVER OSERROR command to automatically exit should an operating system error occur. In iSQL*Plus, the script is stopped and focus is returned to the Workspace. See the WHENEVER SQLERROR command on page 12-187, and the WHENEVER OSERROR command on page 12-185 for more information.

Defining Substitution Variables

You can define variables, called substitution variables, for repeated use in a single script by using the SQL*Plus DEFINE command. Note that you can also define substitution variables to use in titles and to save your keystrokes (by defining a long string as the value for a variable with a short name).

Example 5-8 Defining a Substitution Variable

To define a substitution variable L_NAME and give it the value "SMITH", enter the following command:

```
DEFINE L_NAME = SMITH
```

To confirm the variable definition, enter DEFINE followed by the variable name:

```
DEFINE L_NAME
```

```
DEFINE L_NAME = "SMITH" (CHAR)
```

To list all substitution variable definitions, enter DEFINE by itself. Note that any substitution variable you define explicitly through DEFINE takes only CHAR values (that is, the value you assign to the variable is always treated as a CHAR datatype).

You can define a substitution variable of datatype NUMBER implicitly through the ACCEPT command. You will learn more about the ACCEPT command.

To delete a substitution variable, use the SQL*Plus command UNDEFINE followed by the variable name.

Using Predefined Variables

There are eight variables containing SQL*Plus information that are defined during SQL*Plus installation. These variables can be redefined, referenced or removed the same as any other variable. They are always available from session to session unless you explicitly remove or redefine them.

See Also:

[Predefined Variables](#) on page 12-46 for a list of the predefined variables and examples of their use.

Using Substitution Variables

Suppose you want to write a query like the one in SALES (see [Example 5-1, "Using a System Editor to Write a SQL Script"](#)) to list the employees with various jobs, not just those whose job is SA_MAN. You could do that by editing a different value into the WHERE clause each time you run the command, but there is an easier way.

By using a substitution variable in place of the text, SA_MAN, in the WHERE clause, you can get the same results you would get if you had written the values into the command itself.

A substitution variable is preceded by one or two ampersands (&). When SQL*Plus encounters a substitution variable in a command, SQL*Plus executes the command as though it contained the value of the substitution variable, rather than the variable itself.

For example, if the variable SORTCOL has the value JOB_ID and the variable MYTABLE has the value EMP_DETAILS_VIEW, SQL*Plus executes the commands

```
SELECT &SORTCOL, SALARY
FROM &MYTABLE
WHERE SALARY>12000;
```

as if they were

```
SELECT JOB_ID, SALARY
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000;
```

Where and How to Use Substitution Variables

You can use substitution variables anywhere in SQL and SQL*Plus commands, except as the first word entered. When SQL*Plus encounters an undefined substitution variable in a command, SQL*Plus prompts you for the value.

You can enter any string at the prompt, even one containing blanks and punctuation. If the SQL command containing the reference should have quote marks around the variable and you do not include them there, the user must include the quotes when prompted.

SQL*Plus reads your response from the keyboard, even if you have redirected terminal input or output to a file. If a terminal is not available (if, for example, you run the script in batch mode), SQL*Plus uses the redirected file.

After you enter a value at the prompt, SQL*Plus lists the line containing the substitution variable twice: once before substituting the value you enter and once after substitution. You can suppress this listing by setting the SET command variable VERIFY to OFF.

Example 5–9 Using Substitution Variables

Create a script named STATS, to be used to calculate a subgroup statistic (the maximum value) on a numeric column:

```
SELECT &GROUP_COL, MAX(&NUMBER_COL) MAXIMUM
FROM &TABLE
GROUP BY &GROUP_COL
.
SAVE STATS
```

```
Created file STATS
```

Now run the script STATS:

```
@STATS
```

And respond to the prompts for values as shown:

```
Enter value for group_col: JOB_ID
old 1: SELECT  &GROUP_COL,
new 1: SELECT  JOB_ID,
Enter value for number_col: SALARY
old 2:          MAX(&NUMBER_COL) MAXIMUM
new 2:          MAX(SALARY) MAXIMUM
Enter value for table: EMP_DETAILS_VIEW
old 3: FROM    &TABLE
new 3: FROM    EMP_DETAILS_VIEW
Enter value for group_col: JOB_ID
old 4: GROUP BY &GROUP_COL
new 4: GROUP BY JOB_ID
```

SQL*Plus displays the following output:

JOB_ID	MAXIMUM
AC_ACCOUNT	8300
AC_MGR	12000
AD_ASST	4400
AD_PRES	24000
AD_VP	17000
FI_ACCOUNT	9000
FI_MGR	12000
HR_REP	6500
IT_PROG	9000
MK_MAN	13000
MK_REP	6000
PR_REP	10000
PU_CLERK	3100
PU_MAN	11000
SA_MAN	14000
SA_REP	11500
SH_CLERK	4200
ST_CLERK	3600
ST_MAN	8200

19 rows selected.

If you wish to append characters immediately after a substitution variable, use a period to separate the variable from the character. For example:

```
SELECT SALARY FROM EMP_DETAILS_VIEW WHERE EMPLOYEE_ID='&X.5';
Enter value for X: 20
```

is interpreted as

```
SELECT SALARY FROM EMP_DETAILS_VIEW WHERE EMPLOYEE_ID='205';
```

Avoiding Unnecessary Prompts for Values

Suppose you wanted to expand the file `STATS` to include the minimum, sum, and average of the "number" column. You may have noticed that SQL*Plus prompted you twice for the value of `GROUP_COL` and once for the value of `NUMBER_COL` in [Example 5-9, "Using Substitution Variables"](#), and that each `GROUP_COL` or `NUMBER_COL` had a single ampersand in front of it. If you were to add three more functions—using a single ampersand before each—to the script, SQL*Plus would prompt you a total of four times for the value of the number column.

You can avoid being re-prompted for the group and number columns by adding a second ampersand in front of each `GROUP_COL` and `NUMBER_COL` in `STATS`. SQL*Plus automatically `DEFINES` any substitution variable preceded by two ampersands, but does not `DEFINE` those preceded by only one ampersand. When you have defined a variable, SQL*Plus will not prompt for its value in the current session.

Example 5-10 Using Double Ampersands

To expand the script `STATS` using double ampersands and then run the file, first suppress the display of each line before and after substitution:

```
SET VERIFY OFF
```

Now retrieve and edit STATS by entering the following commands:

GET STATS

```
SELECT  &GROUP_COL,
MAX (&NUMBER_COL) MAXIMUM
FROM    &TABLE
GROUP BY &GROUP_COL
```

2

```
2* MAX (&NUMBER_COL) MAXIMUM
```

APPEND ,

```
2* MAX (&NUMBER_COL) MAXIMUM,
```

CHANGE /&/&&

```
2* MAX (&&NUMBER_COL) MAXIMUM,
```

I

```
3i
```

MIN (&&NUMBER_COL) MINIMUM,

```
4i
```

SUM (&&NUMBER_COL) TOTAL,

```
5i
```

AVG (&&NUMBER_COL) AVERAGE

```
6i
```

1

```
1* SELECT  &GROUP_COL,
```

CHANGE /&/&&

```
1* SELECT  &&GROUP_COL,
```

7

```
7* GROUP BY &GROUP_COL
```

```
CHANGE/ &/ &&/
```

```
7* GROUP BY &&GROUP_COL
```

```
SAVE STATS2
```

```
Created file STATS2
```

Finally, run the script STATS2 and respond to the prompts as follows:

```
START STATS2
Enter value for group_col: JOB_ID
Enter value for number_col: SALARY
Enter value for table: EMP_DETAILS_VIEW
```

SQL*Plus displays the following output:

JOB_ID	MAXIMUM	MINIMUM	TOTAL	AVERAGE
AC_ACCOUNT	8300	8300	8300	8300
AC_MGR	12000	12000	12000	12000
AD_ASST	4400	4400	4400	4400
AD PRES	24000	24000	24000	24000
AD_VP	17000	17000	34000	17000
FI_ACCOUNT	9000	6900	39600	7920
FI_MGR	12000	12000	12000	12000
HR_REP	6500	6500	6500	6500
IT_PROG	9000	4200	28800	5760
MK_MAN	13000	13000	13000	13000
MK_REP	6000	6000	6000	6000
JOB_ID	MAXIMUM	MINIMUM	TOTAL	AVERAGE
PR_REP	10000	10000	10000	10000
PU_CLERK	3100	2500	13900	2780
PU_MAN	11000	11000	11000	11000
SA_MAN	14000	10500	61000	12200
SA_REP	11500	6100	250500	8350
SH_CLERK	4200	2500	64300	3215
ST_CLERK	3600	2100	55700	2785
ST_MAN	8200	5800	36400	7280

19 rows selected.

Note that you were prompted for the values of NUMBER_COL and GROUP_COL only once. If you were to run STATS2 again during the current session, you would be prompted for TABLE (because its name has a single ampersand and the variable is therefore not DEFINED) but not for GROUP_COL or NUMBER_COL (because their names have double ampersands and the variables are therefore DEFINED).

Before continuing, set the system variable VERIFY back to ON:

```
SET VERIFY ON
```

Restrictions

You cannot use substitution variables in the buffer editing commands, APPEND, CHANGE, DEL, and INPUT, nor in other commands where substitution would be meaningless. The buffer editing commands, APPEND, CHANGE, and INPUT, treat text beginning with "&" or "&&" literally, like any other text string.

System Variables and iSQL*Plus Preferences

The following system variables, specified with the SQL*Plus SET command or in iSQL*Plus preferences, affect substitution variables:

System Variable	Affect on Substitution Variables
SET CONCAT	Defines the character that separates the name of a substitution variable or parameter from characters that immediately follow the variable or parameter—by default the period (.).
SET DEFINE	Defines the substitution character (by default the ampersand "&") and turns substitution on and off.
SET ESCAPE	Defines an escape character you can use before the substitution character. The escape character instructs SQL*Plus to treat the substitution character as an ordinary character rather than as a request for variable substitution. The default escape character is a backslash (\).
SET NUMFORMAT	Sets the default format for displaying numbers, including numeric substitution variables.
SET NUMWIDTH	Sets the default width for displaying numbers, including numeric substitution variables.
SET VERIFY ON	Lists each line of the script before and after substitution.

See [SET](#) on page 12-89 for more information about system variables.

Substitution Variables in iSQL*Plus

System variables specified in the Preferences screens can affect iSQL*Plus behavior. The Substitution Variable Prefix, Display Substitution Variable, Substitution Variable Reference Terminator and Escape Character preferences affect variable substitution behavior.

iSQL*Plus will only prompt for input when scripts are invoked from the Workspace and output is being displayed in the browser (Below Input Area option). iSQL*Plus will not prompt for values when output is set to any of the other three options, or when invoked using the iSQL*Plus dynamic URL syntax.

iSQL*Plus prompts for each substitution variable as it encounters it by displaying a separate Input Required screen.

To synchronize variable substitution, set the Substitution Variable Prefix preference ON to set iSQL*Plus to always prompt for substitution variables before running any further scripts. Click the Execute button to execute the command.

Enter your script using '&' and '&&' as the prefix for variables. Click the Execute button to execute the script. iSQL*Plus prompts you for values for the substitution variables in your script. At the end of script execution, any double ampersand substitution variables in the script remain defined. This means that you are not prompted to enter values for these variables again, until they have been undefined, or you log out of iSQL*Plus. If this is not the behavior you want, then use single

ampersand substitution variables in your script. You are prompted to substitute a value for each occurrence of a substitution variable created with a single ampersand. If you use DEFINE to define variable values in your script in this mode, the defined values override values entered in the Input Required screen.

Substitution variables can also be given values passed as parameters using the iSQL*Plus dynamic report URL syntax. These values can be sent to iSQL*Plus in a POST action from an HTML form you write. This enables you to write applications that gather all input in one form, and also to do field level validation in JavaScript.

iSQL*Plus Input Required Screen

When iSQL*Plus executes a script containing substitution variables, the Input Required screen is displayed for each substitution variable. For example, when you enter:

```
BREAK ON &&SORTCOL
SELECT &SORTCOL, SALARY
FROM &MYTABLE
WHERE SALARY > 12000
ORDER BY &SORTCOL;
```

iSQL*Plus displays:



Enter Value for *sortcol*

Enter a value for the *sortcol* variable. For example, enter LAST_NAME. Remember that when a substitution variable is defined with a single ampersand, you are prompted for its value at every occurrence. If you define the variable with a double ampersand, the value is defined for the session and you will only be prompted for it once.

When prompted, enter a value for the *mytable* variable. For example, enter EMP_DETAILS_VIEW.

Continue

Click the Continue button to execute the script in the Input area with the input values you entered.

Cancel

Click the Cancel button to cancel execution of the script and return to the Workspace.

Passing Parameters through the START Command

You can bypass the prompts for values associated with substitution variables by passing values to parameters in a script through the START command.

You do this by placing an ampersand (&) followed by a numeral in the script in place of a substitution variable. Each time you run this script, START replaces each &1 in the file with the first value (called an argument) after START filename, then replaces each &2 with the second value, and so forth.

For example, you could include the following commands in a script called MYFILE:

```
SELECT * FROM EMP_DETAILS_VIEW
WHERE JOB_ID='&1'
AND SALARY='&2';
```

In the following START command, SQL*Plus would substitute PU_CLERK for &1 and 3100 for &2 in the script MYFILE:

```
START MYFILE PU_CLERK 3100
```

When you use arguments with the START command, SQL*Plus DEFINES each parameter in the script with the value of the appropriate argument.

Example 5–11 Passing Parameters through START

To create a new script based on SALES that takes a parameter specifying the job to be displayed, enter

```
GET SALES
```

```
1 COLUMN LAST_NAME HEADING 'LAST NAME'
2 COLUMN SALARY HEADING 'MONTHLY SALARY' FORMAT $99,999
3 COLUMN COMMISSION_PCT HEADING 'COMMISSION %' FORMAT 90.90
4 SELECT LAST_NAME, SALARY, COMMISSION_PCT
5 FROM EMP_DETAILS_VIEW
6* WHERE JOB_ID='SA_MAN'
```

```
6
```

```
6* WHERE JOB_ID='SA_MAN'
```

```
CHANGE /SA_MAN/&1
```

```
6* WHERE JOB_ID='&1'
```

```
SAVE ONEJOB
```

```
Created file ONEJOB
```

Now run the command with the parameter SA_MAN:

```
START ONEJOB SA_MAN
```

SQL*Plus lists the line of the SQL command that contains the parameter, before and after replacing the parameter with its value, and then displays the output:

```

old 3: WHERE JOB_ID='&1'
new 3: WHERE JOB_ID='SA_MAN'

LAST NAME                MONTHLY SALARY COMMISSION %
-----
Russell                   $14,000         0.40
Partners                  $13,500         0.30
Errazuriz                 $12,000         0.30
Cambrault                 $11,000         0.30
Zlotkey                   $10,500         0.20

```

You can use many parameters in a script. Within a script, you can refer to each parameter many times, and you can include the parameters in any order.

While you cannot use parameters when you run a command with RUN or slash (/), you could use substitution variables instead.

Before continuing, return the columns to their original heading by entering the following command:

```
CLEAR COLUMN
```

Communicating with the User

Three SQL*Plus commands—PROMPT, ACCEPT, and PAUSE—help you communicate with the end user. These commands enable you to send messages to the screen and receive input from the user, including a simple Return. You can also use PROMPT and ACCEPT to customize the prompts for values SQL*Plus automatically generates for substitution variables.

Receiving a Substitution Variable Value

Through PROMPT and ACCEPT, you can send messages to the end user and receive values from end-user input. PROMPT displays a message you specify on-screen to give directions or information to the user. ACCEPT prompts the user for a value and stores it in the substitution variable you specify. Use PROMPT in conjunction with ACCEPT when a prompt spans more than one line.

Example 5-12 Prompting for and Accepting Input

To direct the user to supply a report title and to store the input in the variable MYTITLE for use in a subsequent query, first clear the buffer:

```
CLEAR BUFFER
```

Next, set up a script as shown and save this file as PROMPT1:

```

PROMPT Enter a title of up to 30 characters
ACCEPT MYTITLE PROMPT 'Title: '
TTITLE LEFT MYTITLE SKIP 2
SELECT EMPLOYEE_ID, FIRST_NAME, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE JOB_ID='SA_MAN'

SAVE PROMPT1

```

```
Created file PROMPT1.sql
```

The TTITLE command sets the top title for your report. See [Defining Page and Report Titles and Dimensions](#) on page 6-17 for more information about the TTITLE command.

Finally, run the script, responding to the prompt for the title as shown:

```
START PROMPT1
```

```
Enter a title of up to 30 characters
Title: Department Report
Department Report
```

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	SALARY
145	John	Russell	14000
146	Karen	Partners	13500
147	Alberto	Errazuriz	12000
148	Gerald	Cambrault	11000
149	Eleni	Zlotkey	10500

Before continuing, turn the TTITLE command off:

```
TTITLE OFF
```

Customizing Prompts for Substitution Variable

If you want to customize the prompt for a substitution variable value, use PROMPT and ACCEPT in conjunction with the substitution variable, as shown in the following example.

Example 5-13 Using PROMPT and ACCEPT in Conjunction with Substitution Variables

As you have seen in [Example 5-12, "Prompting for and Accepting Input"](#), SQL*Plus automatically generates a prompt for a value when you use a substitution variable. You can replace this prompt by including PROMPT and ACCEPT in the script with the query that references the substitution variable. First clear the buffer with:

```
CLEAR BUFFER
```

To create such a file, enter the following:

```
INPUT
PROMPT Enter a valid employee ID
PROMPT For Example 145, 206
ACCEPT ENUMBER NUMBER PROMPT 'Employee ID. : '
SELECT FIRST_NAME, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE EMPLOYEE_ID=&ENUMBER;
```

Save this file as PROMPT2. Next, run this script. SQL*Plus prompts for the value of ENUMBER using the text you specified with PROMPT and ACCEPT:

```
START PROMPT2
```

SQL*Plus prompts you to enter an Employee ID:

```
Enter a valid employee ID
For Example 145, 206

Employee ID. :
```

205

```

old 3: WHERE EMPLOYEE_ID=&ENUMBER
new 3: WHERE EMPLOYEE_ID=      205

Department Report

FIRST_NAME          LAST_NAME          SALARY
-----
Shelley             Higgins             12000

```

What would happen if you typed characters instead of numbers? Since you specified NUMBER after the variable name in the ACCEPT command, SQL*Plus will not accept a non-numeric value:

Try entering characters instead of numbers to the prompt for "Employee ID.", SQL*Plus will respond with an error message and prompt you again to re-enter the correct number:

```
START PROMPT2
```

When SQL*Plus prompts you to enter an Employee ID, enter the word "one" instead of a number:

```

Enter a valid employee ID
For Example 145, 206

Employee ID. :

```

```
one
```

```
SP2-0425: "one" is not a valid number
```

Sending a Message and Accepting Return as Input

If you want to display a message on the user's screen and then have the user press Return after reading the message, use the SQL*Plus command PAUSE. For example, you might include the following lines in a script:

```
PROMPT Before continuing, make sure you have your account card.
PAUSE Press RETURN to continue.
```

In *i*SQL*Plus, PAUSE displays a Next Page button. Users must click Next Page to continue.

Clearing the Screen

If you want to clear the screen before displaying a report (or at any other time), include the SQL*Plus CLEAR command with its SCREEN clause at the appropriate point in your script, using the following format:

```
CLEAR SCREEN
```

In *i*SQL*Plus, click the Clear button.

Before continuing to the next section, reset all columns to their original formats and headings by entering the following command:

```
CLEAR COLUMNS
```

Using Bind Variables

Bind variables are variables you create in SQL*Plus and then reference in PL/SQL or SQL. If you create a bind variable in SQL*Plus, you can use the variable as you would a declared variable in your PL/SQL subprogram and then access the variable from SQL*Plus. You can use bind variables for such things as storing return codes or debugging your PL/SQL subprograms.

Because bind variables are recognized by SQL*Plus, you can display their values in SQL*Plus or reference them in PL/SQL subprograms that you run in SQL*Plus.

Creating Bind Variables

You create bind variables in SQL*Plus with the VARIABLE command. For example

```
VARIABLE ret_val NUMBER
```

This command creates a bind variable named `ret_val` with a datatype of NUMBER. See the [VARIABLE](#) command on page 12-178 for more information. (To list all bind variables created in a session, type VARIABLE without any arguments.)

Referencing Bind Variables

You reference bind variables in PL/SQL by typing a colon (:) followed immediately by the name of the variable. For example

```
:ret_val := 1;
```

To change this bind variable in SQL*Plus, you must enter a PL/SQL block. For example:

```
BEGIN
  :ret_val:=4;
END;
/
```

```
PL/SQL procedure successfully completed.
```

This command assigns a value to the bind variable named `ret_val`.

Displaying Bind Variables

To display the value of a bind variable in SQL*Plus, you use the SQL*Plus PRINT command. For example:

```
PRINT RET_VAL
```

```
RET_VAL
-----
         4
```

This command displays a bind variable named `ret_val`. See [PRINT](#) on page 12-72 for more information about displaying bind variables.

Using REFCURSOR Bind Variables

SQL*Plus REFCURSOR bind variables allow SQL*Plus to fetch and format the results of a SELECT statement contained in a PL/SQL block.

REFCURSOR bind variables can also be used to reference PL/SQL cursor variables in stored procedures. This enables you to store SELECT statements in the database and reference them from SQL*Plus.

A REFCURSOR bind variable can also be returned from a stored function.

Example 5–14 Creating, Referencing, and Displaying REFCURSOR Bind Variables

To create, reference and display a REFCURSOR bind variable, first declare a local bind variable of the REFCURSOR datatype

```
VARIABLE employee_info REFCURSOR
```

Next, enter a PL/SQL block that uses the bind variable in an OPEN... FOR SELECT statement. This statement opens a cursor variable and executes a query. See the *Oracle Database PL/SQL User's Guide and Reference* for information on the OPEN command and cursor variables.

In this example we are binding the SQL*Plus *employee_info* bind variable to the cursor variable.

```
BEGIN
OPEN :employee_info FOR SELECT EMPLOYEE_ID, SALARY
FROM EMP_DETAILS_VIEW WHERE JOB_ID='SA_MAN' ;
END;
/
```

```
PL/SQL procedure successfully completed.
```

The results from the SELECT statement can now be displayed in SQL*Plus with the PRINT command.

```
PRINT employee_info
```

EMPLOYEE_ID	SALARY
145	14000
146	13500
147	12000
148	11000
149	10500

The PRINT statement also closes the cursor. To reprint the results, the PL/SQL block must be executed again before using PRINT.

Example 5–15 Using REFCURSOR Variables in Stored Procedures

A REFCURSOR bind variable is passed as a parameter to a procedure. The parameter has a REF CURSOR type. First, define the type.

```
CREATE OR REPLACE PACKAGE EmpPack AS
TYPE EmpInfoTyp IS REF CURSOR;
PROCEDURE EmpInfoRpt (emp_cv IN OUT EmpInfoTyp);
END EmpPack;
/
```

```
Package created.
```

Next, create the stored procedure containing an OPEN... FOR SELECT statement.

```
CREATE OR REPLACE PACKAGE BODY EmpPack AS
  PROCEDURE EmpInfoRpt (emp_cv IN OUT EmpInfoTyp) AS
  BEGIN
    OPEN emp_cv FOR SELECT EMPLOYEE_ID, SALARY
    FROM EMP_DETAILS_VIEW
    WHERE JOB_ID='SA_MAN' ;
  END;
END;
/
```

```
Procedure created.
```

Execute the procedure with a SQL*Plus bind variable as the parameter.

```
VARIABLE cv REFCURSOR
EXECUTE EmpPack.EmpInfoRpt (:cv)
```

```
PL/SQL procedure successfully completed.
```

Now print the bind variable.

```
PRINT cv
```

EMPLOYEE_ID	SALARY
145	14000
146	13500
147	12000
148	11000
149	10500

The procedure can be executed multiple times using the same or a different REFCURSOR bind variable.

```
VARIABLE pcv REFCURSOR
EXECUTE EmpInfo_rpt (:pcv)
```

```
PL/SQL procedure successfully completed.
```

```
PRINT pcv
```

EMPLOYEE_ID	SALARY
145	14000
146	13500
147	12000
148	11000
149	10500

Example 5-16 Using REFCURSOR Variables in Stored Functions

Create a stored function containing an OPEN... FOR SELECT statement:

```
CREATE OR REPLACE FUNCTION EmpInfo_fn RETURN -
cv_types.EmpInfo IS
resultset cv_types.EmpInfoTyp;
BEGIN
OPEN resultset FOR SELECT EMPLOYEE_ID, SALARY
FROM EMP_DETAILS_VIEW
WHERE JOB_ID='SA_MAN';
RETURN(resultset);
END;
/
```

```
Function created.
```

Execute the function.

```
VARIABLE rc REFCURSOR
EXECUTE :rc := EmpInfo_fn
```

```
PL/SQL procedure successfully completed.
```

Now print the bind variable.

```
PRINT rc
```

EMPLOYEE_ID	SALARY
145	14000
146	13500
147	12000
148	11000
149	10500

The function can be executed multiple times using the same or a different REFCURSOR bind variable.

```
EXECUTE :rc := EmpInfo_fn
```

```
PL/SQL procedure successfully completed.
```

Formatting SQL*Plus Reports

This chapter explains how to format your query results to produce a finished report. This chapter does not discuss HTML output, but covers the following topics:

- [Formatting Columns](#)
- [Clarifying Your Report with Spacing and Summary Lines](#)
- [Defining Page and Report Titles and Dimensions](#)
- [Storing and Printing Query Results](#)

Read this chapter while sitting at your computer and try out the examples shown. Before beginning, make sure you have access to the HR sample schema described in [SQL*Plus Quick Start](#) on page xix.

Formatting Columns

Through the SQL*Plus COLUMN command, you can change the column headings and reformat the column data in your query results.

Changing Column Headings

When displaying column headings, you can either use the default heading or you can change it using the COLUMN command. The following sections describe how default headings are derived and how to alter them using the COLUMN command. See the [COLUMN](#) command on page 12-28 for more details.

Default Headings

SQL*Plus uses column or expression names as default column headings when displaying query results. Column names are often short and cryptic, however, and expressions can be hard to understand.

Changing Default Headings

You can define a more useful column heading with the HEADING clause of the COLUMN command, in the following format:

```
COLUMN column_name HEADING column_heading
```

Example 6-1 Changing a Column Heading

To produce a report from EMP_DETAILS_VIEW with new headings specified for LAST_NAME, SALARY, and COMMISSION_PCT, enter the following commands:

```
COLUMN LAST_NAME          HEADING 'LAST NAME'
```

```

COLUMN SALARY          HEADING 'MONTHLY SALARY'
COLUMN COMMISSION_PCT HEADING COMMISSION
SELECT LAST_NAME, SALARY, COMMISSION_PCT
FROM EMP_DETAILS_VIEW
WHERE JOB_ID='SA_MAN';

```

LAST NAME	MONTHLY SALARY	COMMISSION
Russell	14000	.4
Partners	13500	.3
Errazuriz	12000	.3
Cambrault	11000	.3
Zlotkey	10500	.2

Note: The new headings will remain in effect until you enter different headings, reset each column's format, or exit from SQL*Plus.

To change a column heading to two or more words, enclose the new heading in single or double quotation marks when you enter the COLUMN command. To display a column heading on more than one line, use a vertical bar (|) where you want to begin a new line. (You can use a character other than a vertical bar by changing the setting of the HEADSEP variable of the SET command. See the SET command on page 12-89 for more information.)

Example 6-2 Splitting a Column Heading

To give the columns SALARY and LAST_NAME the headings MONTHLY SALARY and LAST NAME respectively, and to split the new headings onto two lines, enter

```

COLUMN SALARY HEADING 'MONTHLY|SALARY'
COLUMN LAST_NAME HEADING 'LAST|NAME'

```

Now rerun the query with the slash (/) command:

/

LAST NAME	MONTHLY SALARY	COMMISSION
Russell	14000	.4
Partners	13500	.3
Errazuriz	12000	.3
Cambrault	11000	.3
Zlotkey	10500	.2

Example 6-3 Setting the Underline Character

To change the character used to underline headings to an equal sign and rerun the query, enter the following commands:

```

SET UNDERLINE =
/

```

LAST NAME	MONTHLY SALARY	COMMISSION
=====	=====	=====
Russell	14000	.4
Partners	13500	.3
Errazuriz	12000	.3
Cambrault	11000	.3
Zlotkey	10500	.2

Now change the underline character back to a dash:

```
SET UNDERLINE '-'
```

Note: You must enclose the dash in quotation marks; otherwise, SQL*Plus interprets the dash as a hyphen indicating that you wish to continue the command on another line.

Formatting NUMBER Columns

When displaying NUMBER columns, you can either accept the SQL*Plus default display width or you can change it using the COLUMN command. Later sections describe the default display and how you can alter it with the COLUMN command. The format model will stay in effect until you enter a new one, reset the column's format with

```
COLUMN column_name CLEAR
```

or exit from SQL*Plus.

Default Display

A NUMBER column's width equals the width of the heading or the width of the FORMAT plus one space for the sign, whichever is greater. If you do not explicitly use FORMAT, then the column's width will always be at least the value of SET NUMWIDTH.

SQL*Plus normally displays numbers with as many digits as are required for accuracy, up to a standard display width determined by the value of the NUMWIDTH variable of the SET command (normally 10). If a number is larger than the value of SET NUMWIDTH, SQL*Plus rounds the number up or down to the maximum number of characters allowed if possible, or displays hashes if the number is too large.

You can choose a different format for any NUMBER column by using a format model in a COLUMN command. A format model is a representation of the way you want the numbers in the column to appear, using 9s to represent digits.

Changing the Default Display

The COLUMN command identifies the column you want to format and the model you want to use, as shown:

```
COLUMN column_name FORMAT model
```

Use format models to add commas, dollar signs, angle brackets (around negative values), and leading zeros to numbers in a given column. You can also round the values to a given number of decimal places, display minus signs to the right of negative values (instead of to the left), and display values in exponential notation.

To use more than one format model for a single column, combine the desired models in one COLUMN command (see [Example 6-4](#)). See [COLUMN](#) on page 12-28 for a complete list of format models and further details.

Example 6-4 Formatting a NUMBER Column

To display SALARY with a dollar sign, a comma, and the numeral zero instead of a blank for any zero values, enter the following command:

```
COLUMN SALARY FORMAT '$99,990'
```

Now rerun the current query:

/

LAST NAME	MONTHLY SALARY	COMMISSION
-----	-----	-----
Russell	\$14,000	.4
Partners	\$13,500	.3
Errazuriz	\$12,000	.3
Cambrault	\$11,000	.3
Zlotkey	\$10,500	.2

Use a zero in your format model, as shown, when you use other formats such as a dollar sign and wish to display a zero in place of a blank for zero values.

Formatting Datatypes

When displaying datatypes, you can either accept the SQL*Plus default display width or you can change it using the COLUMN command. The format model will stay in effect until you enter a new one, reset the column's format with

```
COLUMN column_name CLEAR
```

or exit from SQL*Plus. Datatypes, in this manual, include the following types:

- CHAR
- NCHAR
- VARCHAR2 (VARCHAR)
- NVARCHAR2 (NCHAR VARYING)
- DATE
- LONG
- CLOB
- NCLOB
- XMLType

Default Display

The default width of datatype columns is the width of the column in the database. The column width of a LONG, CLOB, NCLOB or XMLType defaults to the value of SET LONGCHUNKSIZE or SET LONG, whichever is the smaller.

The default width and format of unformatted DATE columns in SQL*Plus is determined by the database NLS_DATE_FORMAT parameter. Otherwise, the default

format width is A9. See the **FORMAT** clause of the **COLUMN** command on page 12-28 for more information on formatting DATE columns.

Left justification is the default for datatypes.

Changing the Default Display

You can change the displayed width of a datatype or DATE, by using the **COLUMN** command with a format model consisting of the letter A (for alphanumeric) followed by a number representing the width of the column in characters.

Within the **COLUMN** command, identify the column you want to format and the model you want to use:

```
COLUMN column_name FORMAT model
```

If you specify a width shorter than the column heading, SQL*Plus truncates the heading. See the **COLUMN** command on page 12-28 for more details.

Example 6-5 Formatting a Character Column

To set the width of the column **LAST_NAME** to four characters and rerun the current query, enter

```
COLUMN LAST_NAME FORMAT A4  
/
```

LAST NAME	MONTHLY SALARY	COMMISSION
----	-----	-----
Russ ell	\$14,000	.4
Part ners	\$13,500	.3
Erra zuri z	\$12,000	.3
LAST NAME	MONTHLY SALARY	COMMISSION
----	-----	-----
Camb raul t	\$11,000	.3
Zlot key	\$10,500	.2

If the **WRAP** variable of the **SET** command is set to **ON** (its default value), the employee names wrap to the next line after the fourth character, as shown in [Example 6-5, "Formatting a Character Column"](#). If **WRAP** is set to **OFF**, the names are truncated (cut off) after the fourth character.

The system variable **WRAP** controls all columns; you can override the setting of **WRAP** for a given column through the **WRAPPED**, **WORD_WRAPPED**, and **TRUNCATED** clauses of the **COLUMN** command. See the **COLUMN** command on

page 12-28 for more information on these clauses. You will use the WORD_WRAPPED clause of COLUMN later in this chapter.

NCLOB or multibyte CLOB columns cannot be formatted with the WORD_WRAPPED option. If you format an NCLOB or multibyte CLOB column with COLUMN WORD_WRAPPED, the column data behaves as though COLUMN WRAPPED was applied instead.

Note: The column heading is truncated regardless of the setting of WRAP or any COLUMN command clauses.

Now return the column to its previous format:

```
COLUMN LAST_NAME FORMAT A10
```

Example 6-6 Formatting an XMLType Column

Before illustrating how to format an XMLType column, you must create a table with an XMLType column definition, and insert some data into the table. You can create an XMLType column like any other user-defined column. To create a table containing an XMLType column, enter

```
CREATE TABLE warehouses (
  warehouse_id NUMBER(3),
  warehouse_spec SYS.XMLTYPE,
  warehouse_name VARCHAR2 (35),
  location_id NUMBER(4));
```

To insert a new record containing warehouse_id and warehouse_spec values into the new warehouses table, enter

```
INSERT into warehouses (warehouse_id, warehouse_spec)
VALUES (100, sys.XMLTYPE.createXML(
'<Warehouse whNo="100">
  <Building>Owned</Building>
</Warehouse>'));
```

To set the XMLType column width to 20 characters and then select the XMLType column, enter

```
COLUMN Building FORMAT A20
SELECT
  w.warehouse_spec.extract('/Warehouse/Building/text()').getStringVal()
  "Building"
FROM warehouses w;
```

<pre>Building ----- Owned</pre>

For more information about the createXML, extract, text and getStringVal functions, and about creating and manipulating XMLType data, see *Oracle Database PL/SQL Packages and Types Reference*.

Copying Column Display Attributes

When you want to give more than one column the same display attributes, you can reduce the length of the commands you must enter by using the LIKE clause of the

COLUMN command. The LIKE clause tells SQL*Plus to copy the display attributes of a previously defined column to the new column, except for changes made by other clauses in the same command.

Example 6-7 Copying a Column's Display Attributes

To give the column COMMISSION_PCT the same display attributes you gave to SALARY, but to specify a different heading, enter the following command:

```
COLUMN COMMISSION_PCT LIKE SALARY HEADING BONUS
```

Rerun the query:

```
/
```

LAST NAME	MONTHLY SALARY	BONUS
-----	-----	-----
Russell	\$14,000	\$0
Partners	\$13,500	\$0
Errazuriz	\$12,000	\$0
Cambrault	\$11,000	\$0
Zlotkey	\$10,500	\$0

Listing and Resetting Column Display Attributes

To list the current display attributes for a given column, use the COLUMN command followed by the column name only, as shown:

```
COLUMN column_name
```

To list the current display attributes for all columns, enter the COLUMN command with no column names or clauses after it:

```
COLUMN
```

To reset the display attributes for a column to their default values, use the CLEAR clause of the COLUMN command as shown:

```
COLUMN column_name CLEAR
```

Example 6-8 Resetting Column Display Attributes to their Defaults

To reset all column display attributes to their default values, enter:

```
CLEAR COLUMNS
```

```
columns cleared
```

Suppressing and Restoring Column Display Attributes

You can suppress and restore the display attributes you have given a specific column. To suppress a column's display attributes, enter a COLUMN command in the following form:

```
COLUMN column_name OFF
```

OFF tells SQL*Plus to use the default display attributes for the column, but does not remove the attributes you have defined through the COLUMN command. To restore the attributes you defined through COLUMN, use the ON clause:

```
COLUMN column_name ON
```

Printing a Line of Characters after Wrapped Column Values

As you have seen, by default SQL*Plus wraps column values to additional lines when the value does not fit the column width. If you want to insert a record separator (a line of characters or a blank line) after each wrapped line of output (or after every row), use the RECSEP and RECSEPCHAR variables of the SET command.

RECSEP determines when the line of characters is printed; you set RECSEP to EACH to print after every line, to WRAPPED to print after wrapped lines, and to OFF to suppress printing. The default setting of RECSEP is WRAPPED.

RECSEPCHAR sets the character printed in each line. You can set RECSEPCHAR to any character.

You may wish to wrap whole words to additional lines when a column value wraps to additional lines. To do so, use the WORD_WRAPPED clause of the COLUMN command as shown:

```
COLUMN column_name WORD_WRAPPED
```

Example 6–9 Printing a Line of Characters after Wrapped Column Values

To print a line of dashes after each wrapped column value, enter the commands:

```
SET RECSEP WRAPPED
SET RECSEPCHAR "-"
```

Finally, enter the following query:

```
SELECT LAST_NAME, JOB_TITLE, CITY
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000;
```

Now restrict the width of the column JOB_TITLE and tell SQL*Plus to wrap whole words to additional lines when necessary:

```
COLUMN JOB_TITLE FORMAT A20 WORD_WRAPPED
```

Run the query:

```
/
```

LAST_NAME	JOB_TITLE	CITY
King	President	Seattle
Kochhar	Administration Vice President	Seattle
De Haan	Administration Vice President	Seattle
Russell	Sales Manager	Oxford
Partners	Sales Manager	Oxford
Hartstein	Marketing Manager	Toronto

6 rows selected.

If you set RECSEP to EACH, SQL*Plus prints a line of characters after every row (after every department, for the above example).

Before continuing, set RECSEP to OFF to suppress the printing of record separators:

```
SET RECSEP OFF
```

Clarifying Your Report with Spacing and Summary Lines

When you use an ORDER BY clause in your SQL SELECT command, rows with the same value in the ordered column (or expression) are displayed together in your output. You can make this output more useful to the user by using the SQL*Plus BREAK and COMPUTE commands to create subsets of records and add space or summary lines after each subset.

The column you specify in a BREAK command is called a break column. By including the break column in your ORDER BY clause, you create meaningful subsets of records in your output. You can then add formatting to the subsets within the same BREAK command, and add a summary line (containing totals, averages, and so on) by specifying the break column in a COMPUTE command.

```
SELECT DEPARTMENT_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE SALARY > 12000
ORDER BY DEPARTMENT_ID;
```

DEPARTMENT_ID	LAST_NAME	SALARY
20	Hartstein	13000
80	Russell	14000
80	Partners	13500
90	King	24000
90	Kochhar	17000
90	De Haan	17000

6 rows selected.

To make this report more useful, you would use BREAK to establish DEPARTMENT_ID as the break column. Through BREAK you could suppress duplicate values in DEPARTMENT_ID and place blank lines or begin a new page between departments. You could use BREAK in conjunction with COMPUTE to calculate and print summary lines containing the total salary for each department and for all departments. You could also print summary lines containing the average, maximum, minimum, standard deviation, variance, or row count.

Suppressing Duplicate Values in Break Columns

The BREAK command suppresses duplicate values by default in the column or expression you name. Thus, to suppress the duplicate values in a column specified in an ORDER BY clause, use the BREAK command in its simplest form:

```
BREAK ON break_column
```

Note: Whenever you specify a column or expression in a BREAK command, use an ORDER BY clause specifying the same column or expression. If you do not do this, breaks occur every time the column value changes.

Example 6-10 Suppressing Duplicate Values in a Break Column

To suppress the display of duplicate department numbers in the query results shown, enter the following commands:

```
BREAK ON DEPARTMENT_ID;
```

For the following query (which is the current query stored in the buffer):

```
SELECT DEPARTMENT_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE SALARY > 12000
ORDER BY DEPARTMENT_ID;
```

DEPARTMENT_ID	LAST_NAME	SALARY
20	Hartstein	13000
80	Russell Partners	14000 13500
90	King Kochhar De Haan	24000 17000 17000

6 rows selected.

Inserting Space when a Break Column's Value Changes

You can insert blank lines or begin a new page each time the value changes in the break column. To insert *n* blank lines, use the BREAK command in the following form:

```
BREAK ON break_column SKIP n
```

To skip a page, use the command in this form:

```
BREAK ON break_column SKIP PAGE
```

Example 6-11 Inserting Space when a Break Column's Value Changes

To place one blank line between departments, enter the following command:

```
BREAK ON DEPARTMENT_ID SKIP 1
```

Now rerun the query:

/

DEPARTMENT_ID	LAST_NAME	SALARY
20	Hartstein	13000
80	Russell Partners	14000 13500
90	King Kochhar De Haan	24000 17000 17000

6 rows selected.

Inserting Space after Every Row

You may wish to insert blank lines or a blank page after every row. To skip *n* lines after every row, use `BREAK` in the following form:

```
BREAK ON ROW SKIP n
```

To skip a page after every row, use

```
BREAK ON ROW SKIP PAGE
```

Note: `SKIP PAGE` does not cause a physical page break character to be generated unless you have also specified `NEWPAGE 0`.

Using Multiple Spacing Techniques

Suppose you have more than one column in your `ORDER BY` clause and wish to insert space when each column's value changes. Each `BREAK` command you enter replaces the previous one. Thus, if you want to use different spacing techniques in one report or insert space after the value changes in more than one ordered column, you must specify multiple columns and actions in a single `BREAK` command.

Example 6–12 *Combining Spacing Techniques*

Type the following:

```
SELECT DEPARTMENT_ID, JOB_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000
ORDER BY DEPARTMENT_ID, JOB_ID;
```

Now, to skip a page when the value of `DEPARTMENT_ID` changes and one line when the value of `JOB_ID` changes, enter the following command:

```
BREAK ON DEPARTMENT_ID SKIP PAGE ON JOB_ID SKIP 1
```

To show that `SKIP PAGE` has taken effect, create a `TTITLE` with a page number:

```
TTITLE COL 35 FORMAT 9 'Page:' SQL.PNO
```

Run the new query to see the results:

Page: 1			
DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY
20	MK_MAN	Hartstein	13000
Page: 2			
DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY
80	SA_MAN	Russell	14000
		Partners	13500
Page: 3			
DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY
90	AD_PRES	King	24000
	AD_VP	Kochhar	17000
		De Haan	17000

6 rows selected.

Listing and Removing Break Definitions

Before continuing, turn off the top title display without changing its definition:

```
TTITLE OFF
```

You can list your current break definition by entering the BREAK command with no clauses:

```
BREAK
```

You can remove the current break definition by entering the CLEAR command with the BREAKS clause:

```
CLEAR BREAKS
```

You may wish to place the command CLEAR BREAKS at the beginning of every script to ensure that previously entered BREAK commands will not affect queries you run in a given file.

Computing Summary Lines when a Break Column's Value Changes

If you organize the rows of a report into subsets with the BREAK command, you can perform various computations on the rows in each subset. You do this with the functions of the SQL*Plus COMPUTE command. Use the BREAK and COMPUTE commands together in the following forms:

```
BREAK ON break_column
COMPUTE function LABEL label_name OF column column column
... ON break_column
```

You can include multiple break columns and actions, such as skipping lines in the BREAK command, as long as the column you name after ON in the COMPUTE command also appears after ON in the BREAK command. To include multiple break columns and actions in BREAK when using it in conjunction with COMPUTE, use these commands in the following forms:

```
BREAK ON break_column_1 SKIP PAGE ON break_column_2 SKIP 1
COMPUTE function LABEL label_name OF column column column
```

```
... ON break_column_2
```

The COMPUTE command has no effect without a corresponding BREAK command.

You can COMPUTE on NUMBER columns and, in certain cases, on all types of columns. For more information see the [COMPUTE](#) command on page 12-36.

The following table lists compute functions and their effects

Table 6–1 Compute Functions

Function...	Computes the...
SUM	Sum of the values in the column.
MINIMUM	Minimum value in the column.
MAXIMUM	Maximum value in the column.
AVG	Average of the values in the column.
STD	Standard deviation of the values in the column.
VARIANCE	Variance of the values in the column.
COUNT	Number of non-null values in the column.
NUMBER	Number of rows in the column.

The function you specify in the COMPUTE command applies to all columns you enter after OF and before ON. The computed values print on a separate line when the value of the ordered column changes.

Labels for ON REPORT and ON ROW computations appear in the first column; otherwise, they appear in the column specified in the ON clause.

You can change the compute label by using COMPUTE LABEL. If you do not define a label for the computed value, SQL*Plus prints the unabbreviated function keyword.

The compute label can be suppressed by using the NOPRINT option of the COLUMN command on the break column. See the [COMPUTE](#) command on page 12-36 for more details. If you use the NOPRINT option for the column on which the COMPUTE is being performed, the COMPUTE result is also suppressed.

Example 6–13 Computing and Printing Subtotals

To compute the total of SALARY by department, first list the current BREAK definition:

```
BREAK
```

which displays current BREAK definitions:

```
break on DEPARTMENT_ID page nodup
      on JOB_ID skip 1 nodup
```

Now enter the following COMPUTE command and run the current query:

```
COMPUTE SUM OF SALARY ON DEPARTMENT_ID
/
```

DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY
20	MK_MAN	Hartstein	13000
*****			-----
sum			13000
DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY
80	SA_MAN	Russell	14000
		Partners	13500
*****			-----
sum			27500
DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY
90	AD_PRES	King	24000
	AD_VP	Kochhar	17000
		De Haan	17000
*****			-----
sum			58000
6 rows selected.			

To compute the sum of salaries for departments 10 and 20 without printing the compute label:

```

COLUMN DUMMY NOPRINT;
COMPUTE SUM OF SALARY ON DUMMY;
BREAK ON DUMMY SKIP 1;
SELECT DEPARTMENT_ID DUMMY,DEPARTMENT_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000
ORDER BY DEPARTMENT_ID;
    
```

DEPARTMENT_ID	LAST_NAME	SALARY
20	Hartstein	13000

		13000
80	Russell	14000
80	Partners	13500

		27500
90	King	24000
90	Kochhar	17000
90	De Haan	17000

		58000
6 rows selected.		

To compute the salaries just at the end of the report:

```

COLUMN DUMMY NOPRINT;
COMPUTE SUM OF SALARY ON DUMMY;
BREAK ON DUMMY;
SELECT NULL DUMMY,DEPARTMENT_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000
ORDER BY DEPARTMENT_ID;
    
```

DEPARTMENT_ID	LAST_NAME	SALARY
20	Hartstein	13000
80	Russell	14000
80	Partners	13500
90	King	24000
90	Kochhar	17000
90	De Haan	17000

		98500

6 rows selected.

When you establish the format of a NUMBER column, you must allow for the size of the sums included in the report.

Computing Summary Lines at the End of the Report

You can calculate and print summary lines based on all values in a column by using BREAK and COMPUTE in the following forms:

```

BREAK ON REPORT
COMPUTE function LABEL label_name OF column column column
... ON REPORT
    
```

Example 6-14 Computing and Printing a Grand Total

To calculate and print the grand total of salaries for all sales people and change the compute label, first enter the following BREAK and COMPUTE commands:

```

BREAK ON REPORT
COMPUTE SUM LABEL TOTAL OF SALARY ON REPORT
    
```

Next, enter and run a new query:

```

SELECT LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE JOB_ID='SA_MAN';
    
```

LAST_NAME	SALARY
Russell	14000
Partners	13500
Errazuriz	12000
Cambrault	11000
Zlotkey	10500

TOTAL	61000

To print a grand total (or grand average, grand maximum, and so on) in addition to subtotals (or sub-averages, and so on), include a break column and an ON REPORT

clause in your BREAK command. Then, enter one COMPUTE command for the break column and another to compute ON REPORT:

```
BREAK ON break_column ON REPORT
COMPUTE function LABEL label_name OF column ON break_column
COMPUTE function LABEL label_name OF column ON REPORT
```

Computing Multiple Summary Values and Lines

You can compute and print the same type of summary value on different columns. To do so, enter a separate COMPUTE command for each column.

Example 6–15 Computing the Same Type of Summary Value on Different Columns

To print the total of salaries and commissions for all sales people, first enter the following COMPUTE command:

```
COMPUTE SUM OF SALARY COMMISSION_PCT ON REPORT
```

You do not have to enter a BREAK command; the BREAK you entered in [Example 6–14, "Computing and Printing a Grand Total"](#) is still in effect. Now, change the first line of the select query to include COMMISSION_PCT:

1

```
1* SELECT LAST_NAME, SALARY
```

```
APPEND , COMMISSION_PCT;
```

Finally, run the revised query to see the results:

/

LAST_NAME	SALARY	COMMISSION_PCT
Russell	14000	.4
Partners	13500	.3
Errazuriz	12000	.3
Cambrault	11000	.3
Zlotkey	10500	.2
sum	61000	1.5

You can also print multiple summary lines on the same break column. To do so, include the function for each summary line in the COMPUTE command as follows:

```
COMPUTE function LABEL label_name function
      LABEL label_name function LABEL label_name ...
      OF column ON break_column
```

If you include multiple columns after OF and before ON, COMPUTE calculates and prints values for each column you specify.

Example 6–16 Computing Multiple Summary Lines on the Same Break Column

To compute the average and sum of salaries for the sales department, first enter the following BREAK and COMPUTE commands:

```
BREAK ON DEPARTMENT_ID
```

```
COMPUTE AVG SUM OF SALARY ON DEPARTMENT_ID
```

Now, enter and run the following query:

```
SELECT DEPARTMENT_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE DEPARTMENT_ID = 30
ORDER BY DEPARTMENT_ID, SALARY;
```

DEPARTMENT_ID	LAST_NAME	SALARY
30	Colmenares	2500
	Himuro	2600
	Tobias	2800
	Baida	2900
	Khoo	3100
	Raphaely	11000
*****		-----
avg		4150
sum		24900
6 rows selected.		

Listing and Removing COMPUTE Definitions

You can list your current COMPUTE definitions by entering the COMPUTE command with no clauses:

```
COMPUTE
```

Example 6-17 Removing COMPUTE Definitions

To remove all COMPUTE definitions and the accompanying BREAK definition, enter the following commands:

```
CLEAR BREAKS
```

```
breaks cleared
```

```
CLEAR COMPUTES
```

```
computes cleared
```

You may wish to place the commands CLEAR BREAKS and CLEAR COMPUTES at the beginning of every script to ensure that previously entered BREAK and COMPUTE commands will not affect queries you run in a given file.

Defining Page and Report Titles and Dimensions

The word page refers to a screen full of information on your display or a page of a spooled (printed) report. You can place top and bottom titles on each page, set the number of lines per page, and determine the width of each line.

The word report refers to the complete results of a query. You can also place headers and footers on each report and format them in the same way as top and bottom titles on pages.

Setting the Top and Bottom Titles and Headers and Footers

As you have already seen, you can set a title to display at the top of each page of a report. You can also set a title to display at the bottom of each page. The TTITLE command defines the top title; the BTITLE command defines the bottom title.

You can also set a header and footer for each report. The REPHEADER command defines the report header; the REPFOOTER command defines the report footer.

A TTITLE, BTITLE, REPHEADER or REPFOOTER command consists of the command name followed by one or more clauses specifying a position or format and a CHAR value you wish to place in that position or give that format. You can include multiple sets of clauses and CHAR values:

```
TTITLE position_clause(s) char_value position_clause(s) char_value ...
BTITLE position_clause(s) char_value position_clause(s) char_value ...
REPHEADER position_clause(s) char_value position_clause(s) char_value ...
REPFOOTER position_clause(s) char_value position_clause(s) char_value ...
```

For descriptions of all TTITLE, BTITLE, REPHEADER and REPFOOTER clauses, see the [TTITLE](#) command on page 12-174 and the [REPHEADER](#) command on page 12-84.

Example 6-18 Placing a Top and Bottom Title on a Page

To put titles at the top and bottom of each page of a report, enter

```
TTITLE CENTER -
"ACME SALES DEPARTMENT PERSONNEL REPORT"
BTITLE CENTER "COMPANY CONFIDENTIAL"
```

Now run the current query:

/

ACME SALES DEPARTMENT PERSONNEL REPORT		
DEPARTMENT_ID	LAST_NAME	SALARY
30	Colmenares	2500
30	Himuro	2600
30	Tobias	2800
30	Baida	2900
30	Khoo	3100
30	Raphaely	11000
COMPANY CONFIDENTIAL		

6 rows selected.

Example 6-19 Placing a Header on a Report

To put a report header on a separate page, and to center it, enter

```
REPHEADER PAGE CENTER 'PERFECT WIDGETS'
```

Now run the current query:

/

which displays the following two pages of output, with the new REPHEADER displayed on the first page:

```

ACME SALES DEPARTMENT PERSONNEL REPORT
PERFECT WIDGETS

COMPANY CONFIDENTIAL

ACME SALES DEPARTMENT PERSONNEL REPORT
DEPARTMENT_ID LAST_NAME SALARY
-----
30 Colmenares 2500
30 Himuro 2600
30 Tobias 2800
30 Baida 2900
30 Khoo 3100
30 Raphaely 11000

COMPANY CONFIDENTIAL

6 rows selected.

```

To suppress the report header without changing its definition, enter

```
REPHEADER OFF
```

Positioning Title Elements

The report in the preceding exercises might look more attractive if you give the company name more emphasis and place the type of report and the department name on either end of a separate line. It may also help to reduce the line size and thus center the titles more closely around the data.

You can accomplish these changes by adding some clauses to the TTITLE command and by resetting the system variable LINESIZE, as the following example shows.

You can format report headers and footers in the same way as BTITLE and TTITLE using the REPHEADER and REPFOOTER commands.

Example 6-20 Positioning Title Elements

To redisplay the personnel report with a repositioned top title, enter the following commands:

```

TTITLE CENTER 'A C M E W I D G E T' SKIP 1 -
CENTER ===== SKIP 1 LEFT 'PERSONNEL REPORT' -
RIGHT 'SALES DEPARTMENT' SKIP 2
SET LINESIZE 60
/

```

```

          A C M E W I D G E T
          =====
PERSONNEL REPORT                SALES DEPARTMENT

DEPARTMENT_ID LAST_NAME                SALARY
-----
          30 Colmenares                2500
          30 Himuro                    2600
          30 Tobias                     2800
          30 Baida                     2900
          30 Khoo                      3100
          30 Raphaely                  11000

          COMPANY CONFIDENTIAL

6 rows selected.

```

The LEFT, RIGHT, and CENTER clauses place the following values at the beginning, end, and center of the line. The SKIP clause tells SQL*Plus to move down one or more lines.

Note that there is no longer any space between the last row of the results and the bottom title. The last line of the bottom title prints on the last line of the page. The amount of space between the last row of the report and the bottom title depends on the overall page size, the number of lines occupied by the top title, and the number of rows in a given page. In the above example, the top title occupies three more lines than the top title in the previous example. You will learn to set the number of lines per page later in this chapter.

To always print n blank lines before the bottom title, use the SKIP n clause at the beginning of the BTITLE command. For example, to skip one line before the bottom title in the example above, you could enter the following command:

```
BTITLE SKIP 1 CENTER 'COMPANY CONFIDENTIAL'
```

Indenting a Title Element

You can use the COL clause in TTITLE or BTITLE to indent the title element a specific number of spaces. For example, COL 1 places the following values in the first character position, and so is equivalent to LEFT, or an indent of zero. COL 15 places the title element in the 15th character position, indenting it 14 spaces.

Example 6-21 Indenting a Title Element

To print the company name left-aligned with the report name indented five spaces on the next line, enter

```
TTITLE LEFT 'ACME WIDGET' SKIP 1 -
COL 6 'SALES DEPARTMENT PERSONNEL REPORT' SKIP 2
```

Now rerun the current query to see the results:

```
/
```

```

ACME WIDGET
      SALES DEPARTMENT PERSONNEL REPORT

DEPARTMENT_ID LAST_NAME                SALARY
-----
          30 Colmenares                2500
          30 Himuro                    2600
          30 Tobias                     2800
          30 Baida                     2900
          30 Khoo                      3100
          30 Raphaely                  11000

                                COMPANY CONFIDENTIAL

6 rows selected.

```

Entering Long Titles

If you need to enter a title greater than 500 characters in length, you can use the SQL*Plus command `DEFINE` to place the text of each line of the title in a separate substitution variable:

```

DEFINE LINE1 = 'This is the first line...'
DEFINE LINE2 = 'This is the second line...'
DEFINE LINE3 = 'This is the third line...'

```

Then, reference the variables in your `TTITLE` or `BTITLE` command as follows:

```

TTITLE CENTER LINE1 SKIP 1 CENTER LINE2 SKIP 1 -
CENTER LINE3

```

Displaying System-Maintained Values in Titles

You can display the current page number and other system-maintained values in your title by entering a system value name as a title element, for example:

```

TTITLE LEFT system-maintained_value_name

```

There are five system-maintained values you can display in titles, the most commonly used of which is `SQL.PNO` (the current page number). See [TTITLE](#) on page 12-174 for a list of system-maintained values you can display in titles.

Example 6-22 *Displaying the Current Page Number in a Title*

To display the current page number at the top of each page, along with the company name, enter the following command:

```

TTITLE LEFT 'ACME WIDGET' RIGHT 'PAGE:' SQL.PNO SKIP 2

```

Now rerun the current query:

```

/

```

```

ACMEWIDGET                                PAGE:          1

DEPARTMENT_ID LAST_NAME                    SALARY
-----
          30 Colmenares                    2500
          30 Himuro                        2600
          30 Tobias                         2800
          30 Baida                         2900
          30 Khoo                          3100
          30 Raphaely                      11000

                                COMPANY CONFIDENTIAL

6 rows selected.
    
```

Note that SQL.PNO has a format ten spaces wide. You can change this format with the FORMAT clause of TTITLE (or BTITLE).

Example 6-23 Formatting a System-Maintained Value in a Title

To close up the space between the word PAGE: and the page number, reenter the TTITLE command as shown:

```

TTITLE LEFT 'ACME WIDGET' RIGHT 'PAGE:' FORMAT 999 -
SQL.PNO SKIP 2
    
```

Now rerun the query:

/

```

ACME WIDGET                                'PAGE:'      1

DEPARTMENT_ID LAST_NAME                    SALARY
-----
          30 Colmenares                    2500
          30 Himuro                        2600
          30 Tobias                         2800
          30 Baida                         2900
          30 Khoo                          3100
          30 Raphaely                      11000

                                COMPANY CONFIDENTIAL

6 rows selected.
    
```

Listing, Suppressing, and Restoring Page Title Definitions

To list a page title definition, enter the appropriate title command with no clauses:

```

TTITLE
BTITLE
    
```

To suppress a title definition, enter:

```

TTITLE OFF
BTITLE OFF
    
```

These commands cause SQL*Plus to cease displaying titles on reports, but do not clear the current definitions of the titles. You may restore the current definitions by entering:

```
TTITLE ON
BTITLE ON
```

Displaying Column Values in Titles

You may wish to create a master/detail report that displays a changing master column value at the top of each page with the detail query results for that value underneath. You can reference a column value in a top title by storing the desired value in a variable and referencing the variable in a TTITLE command. Use the following form of the COLUMN command to define the variable:

```
COLUMN column_name NEW_VALUE variable_name
```

You must include the master column in an ORDER BY clause and in a BREAK command using the SKIP PAGE clause.

Example 6-24 Creating a Master/Detail Report

Suppose you want to create a report that displays two different managers' employee numbers, each at the top of a separate page, and the people reporting to the manager on the same page as the manager's employee number. First create a variable, MGRVAR, to hold the value of the current manager's employee number:

```
COLUMN MANAGER_ID NEW_VALUE MGRVAR NOPRINT
```

Because you will only display the managers' employee numbers in the title, you do not want them to print as part of the detail. The NOPRINT clause you entered above tells SQL*Plus not to print the column MANAGER_ID.

Next, include a label and the value in your page title, enter the proper BREAK command, and suppress the bottom title from the last example:

```
TTITLE LEFT 'Manager: ' MGRVAR SKIP 2
BREAK ON MANAGER_ID SKIP PAGE
BTITLE OFF
```

Finally, enter and run the following query:

```
SELECT MANAGER_ID, DEPARTMENT_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE MANAGER_ID IN (101, 201)
ORDER BY MANAGER_ID, DEPARTMENT_ID;
```

```

Manager:      101

DEPARTMENT_ID LAST_NAME          SALARY
-----
           10 Whalen             4400
           40 Mavris             6500
           70 Baer               10000
          100 Greenberg          12000
          110 Higgins            12000

Manager:      201

DEPARTMENT_ID LAST_NAME          SALARY
-----
           20 Fay                 6000

6 rows selected.

```

If you want to print the value of a column at the bottom of the page, you can use the `COLUMN` command in the following form:

```
COLUMN column_name OLD_VALUE variable_name
```

SQL*Plus prints the bottom title as part of the process of breaking to a new page—after finding the new value for the master column. Therefore, if you simply referenced the `NEW_VALUE` of the master column, you would get the value for the next set of details. `OLD_VALUE` remembers the value of the master column that was in effect before the page break began.

Displaying the Current Date in Titles

You can, of course, date your reports by simply typing a value in the title. This is satisfactory for ad hoc reports, but if you want to run the same report repeatedly, you would probably prefer to have the date automatically appear when the report is run. You can do this by creating a variable to hold the current date.

You can reference the predefined substitution variable `_DATE` to display the current date in a title as you would any other variable.

The date format model you include in your `LOGIN` file or in your `SELECT` statement determines the format in which SQL*Plus displays the date. See your *Oracle Database SQL Reference* for more information on date format models. See [Modifying Your LOGIN File](#) on page 2-5 for more information about the `LOGIN` file.

You can also enter these commands interactively. See [COLUMN](#) on page 12-28 for more information.

Setting Page Dimensions

Typically, a page of a report contains the number of blank line(s) set in the `NEWPAGE` variable of the `SET` command, a top title, column headings, your query results, and a bottom title. SQL*Plus displays a report that is too long to fit on one page on several consecutive pages, each with its own titles and column headings. The amount of data SQL*Plus displays on each page depends on the current page dimensions.

The default page dimensions used by SQL*Plus are shown underneath:

- number of lines before the top title: 1

- number of lines per page, from the top title to the bottom of the page: 14
- number of characters per line: 80

You can change these settings to match the size of your computer screen or, for printing, the size of a sheet of paper.

You can change the page length with the system variable PAGESIZE. For example, you may wish to do so when you print a report.

To set the number of lines between the beginning of each page and the top title, use the NEWPAGE variable of the SET command:

```
SET NEWPAGE number_of_lines
```

If you set NEWPAGE to zero, SQL*Plus skips zero lines and displays and prints a formfeed character to begin a new page. On most types of computer screens, the formfeed character clears the screen and moves the cursor to the beginning of the first line. When you print a report, the formfeed character makes the printer move to the top of a new sheet of paper, even if the overall page length is less than that of the paper. If you set NEWPAGE to NONE, SQL*Plus does not print a blank line or formfeed between report pages.

To set the number of lines on a page, use the PAGESIZE variable of the SET command:

```
SET PAGESIZE number_of_lines
```

You may wish to reduce the line size to center a title properly over your output, or you may want to increase line size for printing on wide paper. You can change the line width using the LINESIZE variable of the SET command:

```
SET LINESIZE number_of_characters
```

Example 6–25 Setting Page Dimensions

To set the page size to 66 lines, clear the screen (or advance the printer to a new sheet of paper) at the start of each page, and set the line size to 70, enter the following commands:

```
SET PAGESIZE 66
SET NEWPAGE 0
SET LINESIZE 70
```

Now enter and run the following commands to see the results:

```
TTITLE CENTER 'ACME WIDGET PERSONNEL REPORT' SKIP 1 -
CENTER '01-JAN-2001' SKIP 2
```

Now run the following query:

```
COLUMN FIRST_NAME HEADING 'FIRST|NAME';
COLUMN LAST_NAME HEADING 'LAST|NAME';
COLUMN SALARY HEADING 'MONTHLY|SALARY' FORMAT $99,999;
SELECT DEPARTMENT_ID, FIRST_NAME, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000;
```

ACME WIDGET PERSONNEL REPORT			
01-JAN-2001			
DEPARTMENT_ID	FIRST NAME	LAST NAME	MONTHLY SALARY
90	Steven	King	\$24,000
90	Neena	Kochhar	\$17,000
90	Lex	De Haan	\$17,000
80	John	Russell	\$14,000
80	Karen	Partners	\$13,500
20	Michael	Hartstein	\$13,000

6 rows selected.

Now reset PAGESIZE, NEWPAGE, and LINESIZE to their default values:

```
SET PAGESIZE 14
SET NEWPAGE 1
SET LINESIZE 80
```

To list the current values of these variables, use the SHOW command:

```
SHOW PAGESIZE
SHOW NEWPAGE
SHOW LINESIZE
```

Through the SQL*Plus command SPOOL, you can store your query results in a file or print them on your computer's default printer.

Storing and Printing Query Results

Send your query results to a file when you want to edit them with a word processor before printing or include them in a letter, email, or other document.

To store the results of a query in a file—and still display them on the screen—enter the SPOOL command in the following form:

```
SPOOL file_name
```

If you do not follow the filename with a period and an extension, SPOOL adds a default file extension to the filename to identify it as an output file. The default varies with the operating system; on most hosts it is LST or LIS. The extension is not appended when you spool to system generated files such as /dev/null and /dev/stderr. See the platform-specific Oracle documentation provided for your operating system for more information.

SQL*Plus continues to spool information to the file until you turn spooling off, using the following form of SPOOL:

```
SPOOL OFF
```

Creating a Flat File

When moving data between different software products, it is sometimes necessary to use a "flat" file (an operating system file with no escape characters, headings, or extra characters embedded). For example, if you do not have Oracle Net, you need to create a flat file for use with SQL*Loader when moving data from Oracle9i to Oracle Database 10g.

To create a flat file with SQL*Plus, you first must enter the following SET commands:

```
SET NEWPAGE 0
SET SPACE 0
SET LINESIZE 80
SET PAGESIZE 0
SET ECHO OFF
SET FEEDBACK OFF
SET VERIFY OFF
SET HEADING OFF
SET MARKUP HTML OFF SPOOL OFF
```

After entering these commands, you use the SPOOL command as shown in the previous section to create the flat file.

The SET COLSEP command may be useful to delineate the columns. For more information, see the [SET](#) command on page 12-89.

Sending Results to a File

To store the results of a query in a file—and still display them on the screen—enter the SPOOL command in the following form:

```
SPOOL file_name
```

SQL*Plus stores all information displayed on the screen after you enter the SPOOL command in the file you specify.

Sending Results to a Printer

To print query results, spool them to a file as described in the previous section. Then, instead of using SPOOL OFF, enter the command in the following form:

```
SPOOL OUT
```

SQL*Plus stops spooling and copies the contents of the spooled file to your computer's standard (default) printer. SPOOL OUT does not delete the spool file after printing.

Example 6–26 *Sending Query Results to a Printer*

To generate a final report and spool and print the results, create a script named EMPRPT containing the following commands.

First, use EDIT to create the script with your operating system text editor.

```
EDIT EMPRPT
```

Next, enter the following commands into the file, using your text editor:

```
SPOOL TEMP
CLEAR COLUMNS
CLEAR BREAKS
CLEAR COMPUTES

COLUMN DEPARTMENT_ID HEADING DEPARTMENT
COLUMN LAST_NAME HEADING 'LAST NAME'
COLUMN SALARY HEADING 'MONTHLY SALARY' FORMAT $99,999

BREAK ON DEPARTMENT_ID SKIP 1 ON REPORT
COMPUTE SUM OF SALARY ON DEPARTMENT_ID
COMPUTE SUM OF SALARY ON REPORT
```

```

SET PAGESIZE 24
SET NEWPAGE 0
SET LINESIZE 70

TTITLE CENTER 'A C M E W I D G E T' SKIP 2 -
LEFT 'EMPLOYEE REPORT' RIGHT 'PAGE:' -
FORMAT 999 SQL.PNO SKIP 2
BTITLE CENTER 'COMPANY CONFIDENTIAL'

SELECT DEPARTMENT_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000
ORDER BY DEPARTMENT_ID;

SPOOL OFF

```

If you do not want to see the output on your screen, you can also add SET TERMOUT OFF to the beginning of the file and SET TERMOUT ON to the end of the file. Save and close the file in your text editor (you will automatically return to SQL*Plus). Now, run the script EMPRPT:

```
@EMPRPT
```

SQL*Plus displays the output on your screen (unless you set TERMOUT to OFF), and spools it to the file TEMP:

A C M E W I D G E T		
EMPLOYEE REPORT		PAGE: 1
DEPARTMENT	LAST NAME	MONTHLY SALARY
-----		-----
20	Hartstein	\$13,000
*****		-----
sum		\$13,000
80	Russell	\$14,000
	Partners	\$13,500
*****		-----
sum		\$27,500
90	King	\$24,000
	Kochhar	\$17,000
	De Haan	\$17,000
*****		-----
sum		\$58,000

sum		\$98,500
	COMPANY CONFIDENTIAL	
6 rows selected.		

Generating HTML Reports from SQL*Plus

This chapter explains how to generate a HTML report containing your query results. This chapter covers the following topics:

- [Creating Reports using Command-line SQL*Plus](#)
- [Creating Reports using iSQL*Plus](#)

Creating Reports using Command-line SQL*Plus

In addition to plain text output, the SQL*Plus command-line interface enables you to generate either a complete web page, or HTML output which can be embedded in a web page. You can use `SQLPLUS -MARKUP "HTML ON"` or `SET MARKUP HTML ON SPOOL ON` to produce complete HTML pages automatically encapsulated with `<HTML>` and `<BODY>` tags.

By default, data retrieved with `MARKUP HTML ON` is output in HTML, though you can optionally direct output to the HTML `<PRE>` tag so that it displays in a web browser exactly as it appears in SQL*Plus. See the [SQLPLUS MARKUP Options](#) on page 3-14 and the [SET MARKUP](#) command on page 12-89 for more information about these commands.

`SQLPLUS -MARKUP "HTML ON"` is useful when embedding SQL*Plus in program scripts. On starting, it outputs the HTML and BODY tags before executing any commands. All subsequent output is in HTML until SQL*Plus terminates.

The `-SILENT` and `-RESTRICT` command-line options may be effectively used with `-MARKUP` to suppress the display of SQL*Plus prompt and banner information, and to restrict the use of some commands.

`SET MARKUP HTML ON SPOOL ON` generates an HTML page for each subsequently spooled file. The HTML tags in a spool file are closed when `SPOOL OFF` is executed or SQL*Plus exits.

You can use `SET MARKUP HTML ON SPOOL OFF` to generate HTML output suitable for embedding in an existing web page. HTML output generated this way has no `<HTML>` or `<BODY>` tags.

Creating Reports

During a SQL*Plus session, use the `SET MARKUP` command interactively to write HTML to a spool file. You can view the output in a web browser.

`SET MARKUP HTML ON SPOOL ON` only specifies that SQL*Plus output will be HTML encoded, it does not create or begin writing to an output file. You must use the

SQL*Plus SPOOL command to start generation of a spool file. This file then has HTML tags including <HTML> and </HTML>.

When creating a HTML file, it is important and convenient to specify a .html or .htm file extension which are standard file extensions for HTML files. This enables you to easily identify the type of your output files, and also enables web browsers to identify and correctly display your HTML files. If no extension is specified, the default SQL*Plus file extension is used.

You use SPOOL OFF or EXIT to append final HTML tags to the spool file and then close it. If you enter another SPOOL filename command, the current spool file is closed as for SPOOL OFF or EXIT, and a new HTML spool file with the specified name is created.

You can use the SET MARKUP command to enable or disable HTML output as required.

Example 7-1 Creating a Report Interactively

You can create HTML output in an interactive SQL*Plus session using the SET MARKUP command. You can include an embedded style sheet, or any other valid text in the HTML <HEAD> tag. Open a SQL*Plus session and enter the following:

```
SET MARKUP HTML ON SPOOL ON PREFORMAT OFF ENTMAP ON -
HEAD "<TITLE>Department Report</TITLE> " -
<STYLE type='text/css'> -
<!-- BODY {background: #FFFFC6} --> -
</STYLE>" -
BODY "TEXT='#FF00ff' " -
TABLE "WIDTH='90%' BORDER='5' "
```

You use the COLUMN command to control column output. The following COLUMN commands create new heading names for the SQL query output. The first command also turns off entity mapping for the DEPARTMENT_NAME column to allow HTML hyperlinks to be correctly created in this column of the output data:

```
COLUMN DEPARTMENT_NAME HEADING 'DEPARTMENT' ENTMAP OFF
COLUMN CITY HEADING 'CITY'
```

SET MARKUP HTML ON SPOOL ON enables SQL*Plus to write HTML to a spool file. The following SPOOL command triggers the writing of the <HTML> and <BODY> tags to the named file:

```
SPOOL report.html
```

After the SPOOL command, anything entered or displayed on standard output is written to the spool file, report.html.

Enter a SQL query:

```
SELECT '<A HREF="http://oracle.com/' || DEPARTMENT_NAME || '.html">' || DEPARTMENT_
NAME || '</A>' DEPARTMENT_NAME, CITY
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000;
```

Enter the SPOOL OFF command:

```
SPOOL OFF
```

The </BODY> and </HTML> tags are appended to the spool file, report.html, before it is closed.

The output from report.sql is a file, report.html, that can be loaded into a web browser. Open report.html in your web browser. It should appear something like the following:

```
SQL> SELECT '<A HREF="http://oracle.com/||DEPARTMENT_NAME||.html">||DEPARTMENT_NAME|'</A>'
DEPARTMENT_NAME, CITY
2 FROM EMP_DETAILS_VIEW
3 WHERE SALARY>12000;
```

DEPARTMENT	CITY
Executive	Seattle
Executive	Seattle
Executive	Seattle
Sales	Oxford
Sales	Oxford
Marketing	Toronto

```
6 rows selected
SQL> SPOOL OFF
```

In this example, the prompts and query text have not been suppressed. Depending on how you invoke a script, you can use SET ECHO OFF or command-line -SILENT options to do this.

The SQL*Plus commands in this example contain several items of usage worth noting:

- The hyphen used to continue lines in long SQL*Plus commands.
- The TABLE option to set table WIDTH and BORDER attributes.
- The COLUMN command to set ENTMAP OFF for the DEPARTMENT_NAME column to enable the correct formation of HTML hyperlinks. This makes sure that any HTML special characters such as quotes and angle brackets are not replaced by their equivalent entities, ", &, < and >.
- The use of quotes and concatenation characters in the SELECT statement to create hyperlinks by concatenating string and variable elements.

View the report.html source in your web browser, or in a text editor to see that the table cells for the Department column contain fully formed hyperlinks as shown:

```
<html>
<head>
<TITLE>Department Report</TITLE> <STYLE type="text/css">
<!-- BODY {background: #FFFFC6} --> </STYLE>
<meta name="generator" content="SQL*Plus 10.2.0.1">
</head>
<body TEXT="#FF00ff">
SQL&gt; SELECT '&lt;&A HREF=&quot;http://oracle.com/'
| |DEPARTMENT_NAME| |'.html&quot;&gt;&gt;' | |DEPARTMENT_NAME
| |'&lt;/A&gt;' DEPARTMENT_NAME, CITY
<br>
2 FROM EMP_DETAILS_VIEW
<br>
3 * WHERE SALARY&gt;12000
<br>
<p>
<table WIDTH="90%" BORDER="5">
<tr><th>DEPARTMENT</th><th>CITY</th></tr>
<tr><td><A HREF="http://oracle.com/Executive.html">Executive</A></td>
<td>Seattle</td></tr>
<tr><td><A HREF="http://oracle.com/Executive.html">Executive</A></td>
<td>Seattle</td></tr>
<tr><td><A HREF="http://oracle.com/Executive.html">Executive</A></td>
<td>Seattle</td></tr>
```

```
<tr><td><A HREF="http://oracle.com/Sales.html">Sales</A></td>
<td>Oxford</td></tr>
<tr><td><A HREF="http://oracle.com/Sales.html">Sales</A></td>
<td>Oxford</td></tr>
<tr><td><A HREF="http://oracle.com/Marketing.html">Marketing</A></td>
<td>Toronto</td></tr>
</table>
<p>
```

6 rows selected.


```
SQL> spool off
<br>
</body>
</html>
```

Example 7-2 Creating a Report using the SQLPLUS Command

Enter the following command at the operating system prompt:

```
SQLPLUS -S -M "HTML ON TABLE 'BORDER="2"' HR@Ora10g @depart.sql>depart.html
```

where depart.sql contains:

```
SELECT DEPARTMENT_NAME, CITY
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000;
EXIT
```

This example starts SQL*Plus with user "HR", prompts for the HR password, sets HTML ON, sets a BORDER attribute for TABLE, and runs the script depart.sql. The output from depart.sql is a web page which, in this case, has been redirected to the file depart.html using the ">" operating system redirect command (it may be different on your operating system). It could be sent to a web browser if SQL*Plus was called in a web server CGI script. See [Suppressing the Display of SQL*Plus Commands in Reports](#) on page 7-5 for information about calling SQL*Plus from a CGI script.

Start your web browser and enter the appropriate URL to open depart.html:

DEPARTMENT_NAME	CITY
Executive	Seattle
Executive	Seattle
Executive	Seattle
Sales	Oxford
Sales	Oxford
Marketing	Toronto

6 rows selected.

The SQLPLUS command in this example contains three layers of nested quotes. From the inside out, these are:

- "2" is a quoted HTML attribute value for BORDER.
- 'BORDER="2"' is the quoted text argument for the TABLE option.
- "HTML ON TABLE 'BORDER="2'''' is the quoted argument for the -MARKUP option.

The nesting of quotes may be different in some operating systems or program scripting languages.

Suppressing the Display of SQL*Plus Commands in Reports

The SQLPLUS -SILENT option is particularly useful when used in combination with -MARKUP to generate embedded SQL*Plus reports using CGI scripts or operating system scripts. It suppresses the display of SQL*Plus commands and the SQL*Plus banner. The HTML output shows only the data resulting from your SQL query.

You can also use SET ECHO OFF to suppress the display of each command in a script that is executed with the START command.

HTML Entities

Certain characters, <, >, " and & have a predefined meaning in HTML. In the previous example, you may have noticed that the > character was replaced by > as soon as you entered the SET MARKUP HTML ON command. To enable these characters to be displayed in your web browser, HTML provides character entities to use instead.

Table 7-1 Equivalent HTML Entities

Character	HTML Entity	Meaning
<	<	Start HTML tag label
>	>	End HTML tag label
"	"	Double quote
&	&	Ampersand

The web browser displays the > character, but the actual text in the HTML encoded file is the HTML entity, >. The SET MARKUP option, ENTMAP, controls the substitution of HTML entities. ENTMAP is set ON by default. It ensures that the characters <, >, " and & are always replaced by the HTML entities representing these characters. This prevents web browsers from misinterpreting these characters when they occur in your SQL*Plus commands, or in data resulting from your query.

You can set ENTMAP at a global level with SET MARKUP HTML ENTMAP ON, or at a column level with COLUMN *column_name* ENTMAP ON.

Creating Reports using iSQL*Plus

You can create dynamic reports, and pass variables to scripts by sending iSQL*Plus a request to run a script from a URL. The script is uploaded using the HTTP POST protocol and must be available through HTTP or FTP. iSQL*Plus executes the script, using any HTML form field values as parameters, and returns the results in a new web browser window.

iSQL*Plus prompts for undefined values for:

- Username and password
- Substitution variables
- ACCEPT commands
- RECOVER commands
- CONNECT commands

iSQL*Plus pauses script execution and displays a Next Page button when a PAUSE command is executed. Select the Next Page button to continue script execution.

Dynamic report output can be displayed over multiple pages, or as a single page. The default is multiple page output with pages of 24 lines. Use the SET PAGESIZE and SET PAUSE commands in your scripts to set single or multiple page output for dynamic reports. For example:

To set dynamic report output to a single page, use:

```
SET PAUSE OFF
```

To set dynamic report output to multiple pages of 40 lines, use:

```
SET PAUSE ON
```

```
SET PAGESIZE 40
```

You can include username and password information in the request. However, for security reasons, it is recommended that you never include your password in plain text. You will always be prompted to enter your password when you run the script.

If you want to use the SET MARKUP command to change the HEAD or BODY options for a report, put the SET MARKUP command before the first command that generates output.

The following examples use the EMP_DETAILS_VIEW view of the Human Resources (HR) sample schema. This schema contains personnel records for a fictitious company. It may be installed as part of the default Oracle Database installation using the Oracle Database Configuration Assistant.

For further information about the sample schemas included with Oracle Database, see the *Oracle Database Sample Schemas* guide.

Example 7-3 Creating a Dynamic Report

Create and save the following script to a file called script.sql on your Application Server.

```
SET PAGESIZE 200
SELECT *
FROM EMP_DETAILS_VIEW
ORDER BY LAST_NAME, EMPLOYEE_ID
/
```

Create an HTML file which contains:

```
<HTML>
<HEAD>
<TITLE>iSQL*Plus Dynamic Report</TITLE>
</HEAD>
<BODY>
<H1><em>i</em>SQL*Plus Report</H1>
<A HREF="http://machine_name.domain:port/isqlplus/dynamic?script=http://machine_
name.domain:port/script.sql">
Run Employee Report</A>
</BODY>
</HTML>
```

Replace machine_name.domain with the host and domain names, and replace port with the port number of your Application Server. Save the HTML file on your Application Server.

Load the HTML file in your web browser and click "Run Employee Report". iSQL*Plus requests your username and password. Log in to iSQL*Plus. iSQL*Plus executes the script and displays the results in your web browser.

Example 7-4 Creating a Dynamic Report with Parameters

Create and save the following script to a file called `employee_name.sql` on your Application Server.

```
SET VERIFY OFF
SET PAGESIZE 200
SET FEEDBACK OFF
SET MARKUP HTML ENTMAP OFF
PROMPT <H1>Employee Details for Employee(s) with Last Name like &last_name%</H1>
SET MARKUP HTML ENTMAP ON
SELECT *
FROM EMPLOYEES
WHERE UPPER(last_name) LIKE UPPER('&last_name%')
/
```

Create an HTML file which contains:

```
<HTML>
<HEAD>
<TITLE>iSQL*Plus Dynamic Report</TITLE>
</HEAD>
<BODY>
<H1><em>i</em>SQL*Plus Report</H1>
<H2>Query by Last Name</H2>
<FORM METHOD=get ACTION="http://machine_name.domain:port/isqlplus/dynamic">
<INPUT TYPE="hidden" NAME="script" VALUE="http://machine_
name.domain:port/employee_name.sql">
Enter last name of employee: <INPUT TYPE="text" NAME="last_name" SIZE="20">
<INPUT TYPE="submit" VALUE="Run Report">
</FORM>
</BODY>
</HTML>
```

The name of the INPUT TYPE should be the same as either a column or substitution variable in your script, for example

```
<INPUT TYPE="text" NAME="last_name" SIZE="20">
```

maps to the substitution variable `&last_name` in the `employee_name.sql` script.

Replace `machine_name.domain` with the host and domain names, and `port` with the iSQL*Plus port number of your Application Server. Save the HTML file on your Application Server.

Load the HTML file in your web browser. Enter a name or partial name in the text field, for example, "Fay". Click the Run Report button. iSQL*Plus executes the script and displays the results in your web browser.

Example 7-5 Creating a Dynamic Script with Parameters and Login Details

Create and save the following script to a file called `employee_id.sql` on your Application Server.

```
SET VERIFY OFF
SET PAGESIZE 200
SET MARKUP HTML ENTMAP OFF
PROMPT <H1>Employee Details for Employee Number &eid</H1>
SET MARKUP HTML ENTMAP ON
SELECT *
FROM EMPLOYEES
WHERE EMPLOYEE_ID = &eid
/
```

Create an HTML file which contains:

```
<HTML>
<HEAD>
<TITLE>iSQL*Plus Dynamic Report</TITLE>
</HEAD>
<BODY>
<H1><em>i</em>SQL*Plus Report</H1>
<H2>Query by Employee ID</H2>
<FORM METHOD=get ACTION="http://machine_name.domain:port/isqlplus/dynamic">
<INPUT TYPE="hidden" NAME="userid" VALUE="hr">
<INPUT TYPE="hidden" NAME="script" VALUE="http://machine_
name.domain:port/employee_id.sql">
Enter employee identification number: <INPUT TYPE="text" NAME="eid" SIZE="10">
<INPUT TYPE="submit" VALUE="Run Report">
</FORM>
</BODY>
</HTML>
```

Replace *machine_name.domain* with the host and domain names, *port* with the iSQL*Plus port number of your Application Server, and *hr* with a valid userid. Save the HTML file on your Application Server.

Load the HTML file in your web browser. Enter an employee identification number in the text field, for example, "105". Click the Run Report button. iSQL*Plus executes the script, prompts for the password and displays the results in your web browser.

Example 7-6 Passing a Connect Identifier to a Dynamic Report

Create an HTML file which contains:

```
<HTML><HEAD><TITLE>iSQL*Plus Report</TITLE>
</HEAD><BODY>
<H1><i>i</i>SQL*Plus Report</H1>
<H2>Search for an Employee</H2>
<FORM METHOD=get ACTION="http://machine_name.domain:port/isqlplus">
<p>
<INPUT TYPE="hidden" NAME="userid" VALUE="hr@ora901">
<INPUT TYPE="hidden" NAME="script"
VALUE="http://machine_name.domain:port/employee_id.sql">
Enter the employee's identification number:
<INPUT TYPE="text" NAME="eid" SIZE="10" value="105">
<INPUT TYPE="submit" VALUE="Search">
</p>
</FORM></BODY></HTML>
```

Replace *machine_name.domain* with the host and domain names, and replace *port* with the port number of your Application Server. Save the HTML file on your Application Server.

The connect identifier, ora91 in the example, needs to be included in the userid INPUT field. The connect identifier must be defined in the tnsnames.ora file of the iSQL*Plus Server you are using.

Tuning SQL*Plus

This chapter provides information about how to tune SQL*Plus for better performance. It discusses the following topics:

- [Tracing Statements](#)
- [Collecting Timing Statistics](#)
- [Tracing Parallel and Distributed Queries](#)
- [Execution Plan Output in Earlier Databases](#)
- [SQL*Plus Script Tuning](#)

For information about tuning Oracle Database, see the *Oracle Database Performance Tuning Guide*.

Tracing Statements

You can automatically get a report on the execution path used by the SQL optimizer and the statement execution statistics. The report is generated after successful SQL DML (that is, SELECT, DELETE, UPDATE and INSERT) statements. It is useful for monitoring and tuning the performance of these statements.

Controlling the Autotrace Report

You can control the report by setting the AUTOTRACE system variable.

Autotrace Setting	Result
SET AUTOTRACE OFF	No AUTOTRACE report is generated. This is the default.
SET AUTOTRACE ON EXPLAIN	The AUTOTRACE report shows only the optimizer execution path.
SET AUTOTRACE ON STATISTICS	The AUTOTRACE report shows only the SQL statement execution statistics.
SET AUTOTRACE ON	The AUTOTRACE report includes both the optimizer execution path and the SQL statement execution statistics.
SET AUTOTRACE TRACEONLY	Like SET AUTOTRACE ON, but suppresses the printing of the user's query output, if any. If STATISTICS is enabled, query data is still fetched, but not printed.

To use this feature, you must create a `PLAN_TABLE` table in your schema and then have the `PLUSTRACE` role granted to you. DBA privileges are required to grant the `PLUSTRACE` role. For information on how to grant a role and how to create the `PLAN_TABLE` table, see the *Oracle Database SQL Reference*.

For more information about the roles and the `PLAN_TABLE`, see the *Oracle Database SQL Reference* and the `AUTOTRACE` variable of the `SET` command on page 12-89.

Example 8-1 Creating a `PLAN_TABLE`

Run the following commands from your SQL*Plus session to create the `PLAN_TABLE` in the HR schema:

```
CONNECT HR
@$ORACLE_HOME/rdbms/admin/utlxplan.sql
```

```
Table created.
```

Example 8-2 Creating the `PLUSTRACE` Role

Run the following commands from your SQL*Plus session to create the `PLUSTRACE` role and grant it to the DBA:

```
CONNECT / AS SYSDBA
@$ORACLE_HOME/sqlplus/admin/plustrce.sql
```

```
drop role plustrace;
```

```
Role dropped.
```

```
create role plustrace;
```

```
Role created.
```

```
grant plustrace to dba with admin option;
```

```
Grant succeeded.
```

Example 8-3 Granting the `PLUSTRACE` Role

Run the following commands from your SQL*Plus session to grant the `PLUSTRACE` role to the HR user:

```
CONNECT / AS SYSDBA
GRANT PLUSTRACE TO HR;
```

```
Grant succeeded.
```

Execution Plan

The Execution Plan shows the SQL optimizer's query execution path. Execution Plan output is generated using `EXPLAIN PLAN` and `DBMS_XPLAN`.

For information about interpreting the output of `DBMS_XPLAN`, see the *Oracle Database Performance Tuning Guide*.

Statistics

The statistics are recorded by the server when your statement executes and indicate the system resources required to execute your statement. The results include the following statistics.

Database Statistic Name	Description
recursive calls	Number of recursive calls generated at both the user and system level. Oracle Database maintains tables used for internal processing. When Oracle Database needs to make a change to these tables, it internally generates an internal SQL statement, which in turn generates a recursive call.
db block gets	Number of times a CURRENT block was requested.
consistent gets	Number of times a consistent read was requested for a block
physical reads	Total number of data blocks read from disk. This number equals the value of "physical reads direct" plus all reads into buffer cache.
redo size	Total amount of redo generated in bytes
bytes sent through SQL*Net to client	Total number of bytes sent to the client from the foreground processes.
bytes received through SQL*Net from client	Total number of bytes received from the client over Oracle Net.
SQL*Net round-trips to/from client	Total number of Oracle Net messages sent to and received from the client
sorts (memory)	Number of sort operations that were performed completely in memory and did not require any disk writes
sorts (disk)	Number of sort operations that required at least one disk write
rows processed	Number of rows processed during the operation

The client referred to in the statistics is SQL*Plus. Oracle Net refers to the generic process communication between SQL*Plus and the server, regardless of whether Oracle Net is installed. You cannot change the default format of the statistics report.

For a more complete list of database statistics, see the *Oracle Database Reference*. For more information about the statistics and how to interpret them, see Chapter 3, "Gathering Optimizer Statistics" in the *Oracle Database Performance Tuning Guide*.

Example 8-4 Tracing Statements for Performance Statistics and Query Execution Path

If the SQL buffer contains the following statement:

```
SELECT E.LAST_NAME, E.SALARY, J.JOB_TITLE
FROM EMPLOYEES E, JOBS J
WHERE E.JOB_ID=J.JOB_ID AND E.SALARY>12000;
```

The statement can be automatically traced when it is run:

```
SET AUTOTRACE ON
/
```

```

LAST_NAME                SALARY JOB_TITLE
-----
King                      24000 President
De Haan                   17000 Administration Vice President
Kochhar                   17000 Administration Vice President
Partners                  13500 Sales Manager
Russell                   14000 Sales Manager
Hartstein                 13000 Marketing Manager
6 rows selected.

Execution Plan
-----
Plan hash value: 2988506077

-----
| Id | Operation          | Name          | Rows | Bytes | Cost (%CPU)| Time     |
-----
|  0 | SELECT STATEMENT  |               |     6 |   360 |     6 (17) | 00:00:01 |
|*  1 |  HASH JOIN        |               |     6 |   360 |     6 (17) | 00:00:01 |
|*  2 |    TABLE ACCESS FULL| EMPLOYEES    |     6 |   204 |     3 (0)  | 00:00:01 |
|  3 |    TABLE ACCESS FULL| JOBS         |    19 |   494 |     2 (0)  | 00:00:01 |
-----

Predicate Information (identified by operation id):
-----
   1 - access("E"."JOB_ID"="J"."JOB_ID")
   2 - filter("E"."SALARY">12000)

Note
-----
   - dynamic sampling used for this statement

Statistics
-----
      0 recursive calls
      0 db block gets
     10 consistent gets
      0 physical reads
      0 redo size
     706 bytes sent via SQL*Net to client
     496 bytes received via SQL*Net from client
      2 SQL*Net roundtrips to/from client
      0 sorts (memory)
      0 sorts (disk)
      6 rows processed

```

Example 8-5 Tracing Statements Without Displaying Query Data

To trace the same statement without displaying the query data, enter:

```

SET AUTOTRACE TRACEONLY
/

```

```

6 rows selected.

Execution Plan
-----
Plan hash value: 2988506077

-----
| Id | Operation          | Name          | Rows | Bytes | Cost (%CPU)| Time     |
-----|-----|-----|-----|-----|-----|-----|
|  0 | SELECT STATEMENT   |               |     6 |   360 |     6 (17) | 00:00:01 |
|*  1 |  HASH JOIN         |               |     6 |   360 |     6 (17) | 00:00:01 |
|*  2 |    TABLE ACCESS FULL| EMPLOYEES     |     6 |   204 |     3 (0)  | 00:00:01 |
|  3 |    TABLE ACCESS FULL| JOBS         |    19 |   494 |     2 (0)  | 00:00:01 |
-----

Predicate Information (identified by operation id):
-----
   1 - access("E"."JOB_ID"="J"."JOB_ID")
   2 - filter("E"."SALARY">12000)

Note
-----
   - dynamic sampling used for this statement

Statistics
-----
      0 recursive calls
      0 db block gets
     10 consistent gets
      0 physical reads
      0 redo size
     706 bytes sent via SQL*Net to client
     496 bytes received via SQL*Net from client
      2 SQL*Net roundtrips to/from client
      0 sorts (memory)
      0 sorts (disk)
      6 rows processed

```

This option is useful when you are tuning a large query, but do not want to see the query report.

Note: Your output may vary depending on the server version and configuration.

Collecting Timing Statistics

Use the SQL*Plus `TIMING` command to collect and display data on the amount of computer resources used to run one or more commands or blocks. `TIMING` collects data for an elapsed period of time, saving the data on commands run during the period in a timer.

See the [TIMING](#) command on page 12-173, and [Tracing Statements](#) on page 8-1 for information about using `AUTOTRACE` to collect statistics.

To delete all timers, enter `CLEAR TIMING`.

Tracing Parallel and Distributed Queries

When you trace a statement in a parallel or distributed query, the Execution Plan output depends on the statement you use.

Example 8-6 Tracing Statements With Parallel Query Option

To trace a parallel query running the parallel query option:

```
create table D2_t1 (unique1 number) parallel -
(degree 6);
```

```
Table created.
```

```
create table D2_t2 (unique1 number) parallel -
(degree 6);
```

```
Table created.
```

```
create unique index d2_i_unique1 on d2_t1(unique1);
```

```
Index created.
```

```
set long 500 longchunksize 500
SET AUTOTRACE ON EXPLAIN
SELECT /*+ INDEX(B,D2_I_UNIQUE1) USE_NL(B) ORDERED -
*/ COUNT (A.UNIQUE1)
FROM D2_T2 A, D2_T1 B
WHERE A.UNIQUE1 = B.UNIQUE1;
```

Execution Plan										

Plan hash value: 107954098										

Id	Operation	Name	Rows	Bytes	Cost(%CPU)	Time	TQ	IN-OUT	PQ Distrib	

0	SELECT STATEMENT		1	26	1 (0)	00:00:01				
1	SORT AGGREGATE		1	26						
2	PX COORDINATOR									
3	PX SEND QC (RANDOM)	:TQ10001	1	26			Q1,01	P->S	QC (RAND)	
4	SORT AGGREGATE		1	26			Q1,01	PCWP		
5	NESTED LOOPS		1	26	1 (0)	00:00:01	Q1,01	PCWP		
6	PX RECEIVE						Q1,01	PCWP		
7	PX SEND BROADCAST	:TQ10000					Q1,00	P->P	BROADCAST	
8	PX BLOCK ITERATOR		1	13	0 (0)	00:00:01	Q1,00	PCWC		
9	TABLE ACCESS FULL	D2_T2	1	13	0 (0)	00:00:01	Q1,00	PCWP		
10	PX BLOCK ITERATOR		1	13	2 (0)	00:00:01	Q1,01	PCWC		
* 11	TABLE ACCESS FULL	D2_T1	1	13	2 (0)	00:00:01	Q1,01	PCWP		

Predicate Information (identified by operation id):										

11 - filter("A"."UNIQUE1"="B"."UNIQUE1")										

Note										

- dynamic sampling used for this statement										

Example 8-7 To monitor disk reads and buffer gets.

```
SET AUTOTRACE TRACEONLY STATISTICS
```

The following shows typical results:

Statistics	

467	recursive calls
27	db block gets
147	consistent gets
20	physical reads
4548	redo size
502	bytes sent via SQL*Net to client
496	bytes received via SQL*Net from client
2	SQL*Net roundtrips to/from client
14	sorts (memory)
0	sorts (disk)
1	rows processed

If consistent gets or physical reads are high relative to the amount of data returned, it indicates that the query is expensive and needs to be reviewed for optimization. For example, if you are expecting less than 1,000 rows back and consistent gets is 1,000,000 and physical reads is 10,000, further optimization is needed.

Note: You can also monitor disk reads and buffer gets using V\$SQL or TKPROF.

Execution Plan Output in Earlier Databases

Execution Plan output from Oracle Database 9i Release 2 (9.2) or earlier is different.

Each line of the Execution Plan has a sequential line number. SQL*Plus also displays the line number of the parent operation.

The Execution Plan consists of four columns displayed in the following order:

Column Name	Description
ID_PLUS_EXP	Shows the line number of each execution step.
PARENT_ID_PLUS_EXP	Shows the relationship between each step and its parent. This column is useful for large reports.
PLAN_PLUS_EXP	Shows each step of the report.
OBJECT_NODE_PLUS_EXP	Shows database links or parallel query servers used.

The format of the columns may be altered with the COLUMN command. For example, to stop the PARENT_ID_PLUS_EXP column being displayed, enter

```
COLUMN PARENT_ID_PLUS_EXP NOPRINT
```

The default formats can be found in the site profile (for example, glogin.sql).

The Execution Plan output is generated using the EXPLAIN PLAN command.

When you trace a statement in a parallel or distributed query, the Execution Plan shows the cost based optimizer estimates of the number of rows (the cardinality). In general, the cost, cardinality and bytes at each node represent cumulative results. For

example, the cost of a join node accounts for not only the cost of completing the join operations, but also the entire costs of accessing the relations in that join.

Lines marked with an asterisk (*) denote a parallel or remote operation. Each operation is explained in the second part of the report. See the *Oracle Database Performance Tuning Guide* for more information on parallel and distributed operations.

The second section of this report consists of three columns displayed in the following order

Column Name	Description
ID_PLUS_EXP	Shows the line number of each execution step.
OTHER_TAG_PLUS_EXP	Describes the function of the SQL statement in the OTHER_PLUS_EXP column.
OTHER_PLUS_EXP	Shows the text of the query for the parallel server or remote database.

The format of the columns may be altered with the COLUMN command. The default formats can be found in the site profile (for example, glogin.sql).

SQL*Plus Script Tuning

Most performance benefit comes from tuning SQL queries executed in a script. This is done with tools like SQL*Plus's AUTOTRACE command. It involves restructuring queries to make best use of the Oracle Database SQL optimizer. For information about Tuning SQL statements, see the *Oracle Database Performance Tuning Guide*.

The performance gains made by tuning SQL*Plus-specific commands are smaller, but could be important for some applications. The following system variables and commands can influence SQL*Plus performance.

COLUMN NOPRINT

COLUMN NOPRINT turns off screen output and printing of the column heading and all values selected for the column.

It is better to remove an unneeded column from a SELECT than it is to use COLUMN NOPRINT to stop it displaying. Removing the column from the query means the SQL engine does not need to process it, or need to transfer the column data back to SQL*Plus.

SET APPINFO OFF

Sets automatic registering of scripts through the DBMS_APPLICATION_INFO package. Setting APPINFO OFF prevents administrators monitoring the performance and resource usage of scripts.

If many SQL scripts are being called, then turning APPINFO OFF stops internal SQL*Plus calls to the database DBMS_APPLICATION_INFO package.

SET ARRAYSIZE

Sets the number of rows that SQL*Plus will fetch from the database at one time. Valid values are 1 to 5000.

The effectiveness of setting `ARRAYSIZE` depends on how well Oracle Database fills network packets and your network latency and throughput. In recent versions of SQL*Plus and Oracle Database, `ARRAYSIZE` may have little effect. Overlarge sizes can easily take more SQL*Plus memory which may decrease overall performance.

SET DEFINE OFF

`SET DEFINE OFF` disables the parsing of commands to replace substitution variables with their values.

SET FLUSH OFF

`SET FLUSH OFF` enables the operating system to buffer output. `ON` disables buffering and flushes output to the screen. Any benefit from setting `FLUSH` either `ON` or `OFF` depends on your operating system and data. The gain may be marginal.

Use `OFF` only when you run a script that does not require user interaction and whose output you do not need to see until the script finishes running.

`SET FLUSH` is not supported in *iSQL*Plus*

SET LINESIZE

`SET LINESIZE` sets the total number of characters that SQL*Plus displays on one line before beginning a new line.

Keep `LINESIZE` as small as possible to avoid extra memory allocations and memory copying.

However, if `LINESIZE` is too small, columns that cannot fit next to each other are put on separate lines. This may reduce performance significantly.

SET LONGCHUNKSIZE

`SET LONGCHUNKSIZE` sets the size of the increments SQL*Plus uses to retrieve a `CLOB`, `LONG`, `NCLOB` or `XMLType` value.

Experiment with different sizes if `LONGS` or `LOBs` are being fetched.

SET PAGESIZE

Sets the number of rows on each page of output in *iSQL*Plus*, and the number of lines on each page of output in command-line and Windows GUI.

Increase `PAGESIZE` to avoid printing headings frequently, or set it to 0 to prevent headings being displayed.

SET SERVEROUTPUT

`SET SERVEROUTPUT OFF` suppresses the display output (`DBMS_OUTPUT.PUT_LINE`) of stored procedures or PL/SQL blocks in SQL*Plus.

Setting `SERVEROUTPUT OFF` stops internal SQL*Plus calls to the `DBMS_OUTPUT` package done after user SQL statements.

SET SQLPROMPT

Sets the SQL*Plus command prompt.

Use the default prompt, "SQL> " to stop variable substitution occurring each time the prompt is displayed.

SET SQLPROMPT is not supported in *iSQL*Plus*

SET TAB

Determines how SQL*Plus formats white space in terminal output.

Setting TAB ON causes multiple spaces to be compressed in terminal output. Unless this significantly reduces the written data, the processing required may marginally outweigh any benefit.

SET TAB is not supported in *iSQL*Plus*

SET TERMOUT

SET TERMOUT OFF suppresses the display so that you can spool output from a script without seeing it on the screen.

If both spooling to file and writing to terminal are not required, use SET TERMOUT OFF in SQL scripts to disable terminal output.

SET TERMOUT is not supported in *iSQL*Plus*

SET TRIMOUT ON SET TRIMSPPOOL ON

SET TRIMOUT ON or SET TRIMSPPOOL ON removes trailing blanks at the end of each displayed or spooled line.

Setting these variables ON can reduce the amount of data written. However, if LINESIZE is optimal, it may be faster to set the variables OFF. The SQL*Plus output line is blank filled throughout the query processing routines so removing the spaces could take extra effort.

SET TRIMOUT and SET TRIMSPPOOL are not supported in *iSQL*Plus*.

UNDEFINE

Deletes substitution variables that you defined either explicitly (with the DEFINE command) or implicitly (with an argument to the START command or COLUMN NEW_VAL | OLD_VAL).

Use the UNDEFINE command to remove unnecessary substitution variables. This can reduce the time taken for any operation that uses '&', new_value or old_value variables.

SQL*Plus Security

This chapter describes the available methods for controlling access to database tables, SQL*Plus and *i*SQL*Plus commands, and *i*SQL*Plus access. It covers the following topics:

- [PRODUCT_USER_PROFILE Table](#)
- [Disabling SQL*Plus, SQL, and PL/SQL Commands](#)
- [Creating and Controlling Roles](#)
- [Disabling Commands with SQLPLUS -RESTRICT](#)
- [Program Argument Security](#)
- [iSQL*Plus Security](#)

PRODUCT_USER_PROFILE Table

SQL*Plus uses the PRODUCT_USER_PROFILE (PUP) table, a table in the SYSTEM account, to provide product-level security that supplements the user-level security provided by the SQL GRANT and REVOKE commands and user roles.

DBAs can use the PUP table to disable certain SQL and SQL*Plus commands in the SQL*Plus environment on a per-user basis. SQL*Plus—not Oracle Database—enforces this security. DBAs can even restrict access to the GRANT, REVOKE, and SET ROLE commands to control users' ability to change their database privileges.

SQL*Plus reads restrictions from the PUP table when a user logs in to SQL*Plus and maintains those restrictions for the duration of the session. Changes to the PUP table will only take effect the next time the affected users log in to SQL*Plus.

When SYSTEM, SYS, or a user authenticating with SYSDBA or SYSOPER privileges connects or logs in, SQL*Plus does not read the PUP table. Therefore, no restrictions apply to these users.

The PUP table applies only to the local database. If accessing objects on a remote database through a database link, the PUP table for the remote database does not apply. The remote database cannot extract the username and password from the database link in order to determine that user's profile and privileges.

Creating the PUP Table

You can create the PUP table by running the script named PUPBLD with the extension SQL as SYSTEM. The exact format of the file extension and the location of the file are system dependent. See your DBA for more information.

Note: If the table is created incorrectly, all users other than privileged users will see a warning when connecting to Oracle Database that the PUP table information is not loaded.

PUP Table Structure

The PUP table has the following columns:

PRODUCT	NOT NULL VARCHAR2 (30)
USERID	VARCHAR2 (30)
ATTRIBUTE	VARCHAR2 (240)
SCOPE	VARCHAR2 (240)
NUMERIC_VALUE	NUMBER (15, 2)
CHAR_VALUE	VARCHAR2 (240)
DATE_VALUE	DATE
LONG_VALUE	LONG

Description and Use of PUP Columns

The following list describes each column in the PUP table:

PUP Column	Description
PRODUCT	Must contain the product name (in this case "SQL*Plus"). You cannot enter wildcards or NULL in this column.
USERID	Must contain the username (uppercase) of the user for whom you wish to disable the command. To disable the command for more than one user, use SQL wild cards (%) or make multiple entries. Thus, all of the following entries are valid: <ul style="list-style-type: none"> ▪ HR ▪ CLASS1 ▪ CLASS% (all users whose names start with CLASS) ▪ % (all users)
ATTRIBUTE	Must contain the name (in uppercase) of the SQL, SQL*Plus, or PL/SQL command to disable (for example, RUN). If you are disabling a role, it must contain the character string "ROLES". You cannot enter a wildcard. See PUP Table Administration on page 9-3 for a list of SQL and SQL*Plus commands you can disable. See Creating and Controlling Roles on page 9-5 for information on how to disable a role.
SCOPE	Not used, it is recommended that you enter NULL. Other products may store specific file restrictions or other data in this column.
NUMERIC_VALUE	Not used, it is recommended that you enter NULL. Other products may store numeric values in this column.
CHAR_VALUE	Must contain the character string "DISABLED" to disable a SQL, SQL*Plus, or PL/SQL command. If you are disabling a role, it must contain the name of the role you wish to disable. You cannot use a wildcard. See Disabling Commands with SQLPLUS -RESTRICT on page 9-6 for information on disabling a role.
DATE_VALUE	Not used, it is recommended that you enter NULL. Other products may store DATE values in this column.
LONG_VALUE	Not used, it is recommended that you enter NULL. Other products may store LONG values in this column.

PUP Table Administration

The DBA username SYSTEM owns and has all privileges on the PUP table. Other Oracle Database usernames should have only SELECT access to this table, which enables a view of restrictions for that username and those restrictions assigned to PUBLIC. The script PUPBLD.SQL, when run, grants SELECT access on the PUP table to PUBLIC.

Disabling SQL*Plus, SQL, and PL/SQL Commands

To disable a SQL or SQL*Plus command for a given user, insert a row containing the user's username in the Userid column, the command name in the Attribute column, and DISABLED in the Char_Value column. The Scope, Numeric_Value, and Date_Value columns should contain NULL. For example:

PRODUCT	USERID	ATTRIBUTE	SCOPE	NUMERIC VALUE	CHAR VALUE	DATE VALUE	LONG VALUE
SQL*Plus	HR	HOST			DISABLED		
SQL*Plus	%	INSERT			DISABLED		
SQL*Plus	%	UPDATE			DISABLED		
SQL*Plus	%	DELETE			DISABLED		

To re-enable commands, delete the row containing the restriction.

SQL*Plus Commands That Can Be Disabled

ACCEPT	DEFINE	PASSWORD	SHUTDOWN
APPEND	DEL	PAUSE	SPOOL
ARCHIVE LOG	DESCRIBE	PRINT	START (@, @@)
ATTRIBUTE	DISCONNECT	PROMPT	STARTUP
BREAK	EDIT	RECOVER	STORE
BTITLE	EXECUTE	REMARK	TIMING
CHANGE	EXIT/QUIT	REPFOOTER	TTITLE
CLEAR	GET	REPHEADER	UNDEFINE
COLUMN	HELP (?)	RUN	VARIABLE
COMPUTE	HOST	SAVE	WHENEVER OSERROR
CONNECT	INPUT	SET	WHENEVER SQLERROR
COPY	LIST (;)	SHOW	XQUERY

SQL Commands That Can Be Disabled

ALTER	DELETE	MERGE	SET CONSTRAINTS
ANALYZE	DISASSOCIATE	NOAUDIT	SET ROLE
ASSOCIATE	DROP	PURGE	SET TRANSACTION
AUDIT	EXPLAIN	RENAME	TRUNCATE
CALL	FLASHBACK	REVOKE	UPDATE
COMMENT	GRANT	ROLLBACK	VALIDATE

SQL Commands That Can Be Disabled

COMMIT	INSERT	SAVEPOINT	na
CREATE	LOCK	SELECT	na

You can disable the following PL/SQL commands:

PL/SQL Commands That Can Be Disabled

BEGIN	DECLARE	na	na
-------	---------	----	----

Note:

- Disabling HOST disables the operating system alias for HOST, such as \$ on Windows, and ! on UNIX.
- Disabling LIST disables ; and numbers (numbers entered to go to that line in a script).
- You must disable HELP and ? separately to disable access to command-line help.
- Disabling the SQL*Plus SET command also disables SQL SET CONSTRAINTS, SET ROLE and SET TRANSACTION.
- Disabling SQL*Plus START also disables @ and @@.
- Disabling BEGIN and DECLARE does not prevent the use of SQL*Plus EXECUTE to run PL/SQL. EXECUTE must be disabled separately.
- Disabling EXIT/QUIT is not recommended. If disabled, terminate a command-line session by sending an EOF character such as Ctrl+D in UNIX or Ctrl+Z in Windows. Terminate a Windows GUI session with **File > Exit**. Otherwise, terminate a session by terminating the SQL*Plus process. If disabled, using EXIT/QUIT to terminate the currently running script in *iSQL*Plus* is also disabled. If disabled, the EXIT operation in WHENEVER OSERROR and WHENEVER SQLERROR is also disabled.

Example 9-1 Setting Restrictions in the PUP Table

This is an example of how to insert a row into the PUP table to restrict the user HR from using the SELECT statement:

1. Log in as SYSTEM with the command

```
SQLPLUS SYSTEM
```

2. Insert a row into the PUP table with the command:

```
INSERT INTO PRODUCT_USER_PROFILE
VALUES ('SQL*Plus', 'HR', 'SELECT', NULL, NULL, 'DISABLED', NULL, NULL);
```

3. Connect as HR and try to SELECT something:

```
CONNECT HR
SELECT * FROM EMP_DETAILS_VIEW;
```

This command causes the following error message:

```
SP2-0544: Command SELECT disabled in Product User Profile
```

- To delete this row and remove the restriction from the user HR, CONNECT again as SYSTEM and enter:

```
DELETE FROM PRODUCT_USER_PROFILE WHERE USERID = 'HR';
```

Creating and Controlling Roles

You can use SQL commands to create and control access to roles to provide security for your database tables. By creating a role and then controlling who has access to it, you can ensure that only certain users have access to particular database privileges.

Roles are created and used with the SQL CREATE, GRANT, and SET commands:

- To create a role, you use the CREATE command. You can create roles with or without passwords.
- To grant access to roles, you use the GRANT command. In this way, you can control who has access to the privileges associated with the role.
- To access roles, you use the SET ROLE command. If you created the role with a password, the user must know the password in order to access the role.

For more information about roles, see your *Oracle Database SQL Reference*, your *Oracle Database Administrator's Guide*, and your *Oracle Database Concepts* manual.

Disabling SET ROLE

From SQL*Plus, users can submit any SQL command. In certain situations, this can cause security problems. Unless you take proper precautions, a user could use SET ROLE to access privileges obtained through an application role. With these privileges, they might issue SQL statements from SQL*Plus that could wrongly change database tables.

To prevent application users from accessing application roles in SQL*Plus, you can use the PUP table to disable the SET ROLE command. You also need to disable the BEGIN and SQL*Plus EXECUTE commands to prevent application users setting application roles through a PL/SQL block. This gives a SQL*Plus user only those privileges associated with the roles enabled when they started SQL*Plus. For more information about the creation and usage of user roles, see your *Oracle Database SQL Reference* and *Oracle Database Administrator's Guide*.

Disabling User Roles

To disable a role for a given user, insert a row in the PUP table containing the user's username in the Userid column, "ROLES" in the Attribute column, and the role name in the Char_Value column.

Note: When you enter "PUBLIC" or "%" for the Userid column, you disable the role for all users. You should only use "%" or "PUBLIC" for roles which are granted to "PUBLIC". If you try to disable a role that has not been granted to a user, none of the roles for that user are disabled.

The Scope, Numeric_Value, and Date_Value columns should contain NULL. For example:

PRODUCT	USERID	ATTRIBUTE	SCOPE	NUMERIC VALUE	CHAR VALUE	DATE VALUE	LONG VALUE
SQL*Plus	HR	ROLES			ROLE1		
SQL*Plus	PUBLIC	ROLES			ROLE2		

During login, these table rows are translated into the command

```
SET ROLE ALL EXCEPT ROLE1, ROLE2
```

To ensure that the user does not use the SET ROLE command to change their roles after login, you can disable the SET ROLE command.

To re-enable roles, delete the row containing the restriction.

See [Disabling SET ROLE](#) on page 9-5 for more information.

Disabling Commands with SQLPLUS -RESTRICT

Like the Product User Profile table, the RESTRICT option enables you to disable certain commands that interact with the operating system. However, commands disabled with the -RESTRICT option are disabled even when no connection to a server exists, and remain disabled until SQL*Plus terminates.

The following table shows which commands are disabled in each restriction level.

Command	Level 1	Level 2	Level 3
EDIT	disabled	disabled	disabled
GET			disabled
HOST	disabled	disabled	disabled
SAVE		disabled	disabled
SPOOL		disabled	disabled
START			disabled
STORE		disabled	disabled

Note:

- Disabling HOST also disables your operating system's alias for HOST, such as \$ on Windows, and ! on UNIX.
 - Disabling the SQL*Plus START command will also disable the SQL*Plus @ and @@ commands.
-
-

For more information about the RESTRICT option, see the SQLPLUS [RESTRICT Option](#) on page 3-17.

Program Argument Security

Some operating systems allow any user to see what programs are being run. If the display also shows command-line arguments, it may be possible to view the usernames and passwords of other SQL*Plus users.

For example, on many UNIX or Linux systems the `ps` command shows program arguments. To stop passwords being displayed depends on how you use SQL*Plus.

- To run SQL*Plus interactively, always wait for SQL*Plus to prompt for connection information, particularly your password.
- To run a batch SQL script from a UNIX shell script, set environment variables `MYUSERNAME` and `MYPASSWORD` to the appropriate values. Run a shell script containing:

```
sqlplus /nolog <<EOF
connect $MYUSERNAME/$MYPASSWORD
select ...
EOF
```

- To run a batch SQL script, hard code the username and password as the first line of the SQL script. Then call the script with:

```
sqlplus @myscript.sql
```

When SQL*Plus is started like this, it uses the first line of the script as the `username/password@connection_identifier` string.

Avoid storing your username and password in files or scripts. If you do store your username and password in a file or script, ensure that the file or script is secured from non-authorized access.

iSQL*Plus Security

There are two main areas to consider for security and user authentication when using *iSQL*Plus*:

- The HTTP protocol connection between the web browser and the Application Server.
- The Oracle Net connection between the Application Server and Oracle Database.

It is useful to note that in *iSQL*Plus* you cannot access the middle tier operating system to run commands such as `HOST`, `EDIT` and `SPOOL` which depend on operating system access.

In *iSQL*Plus*, security for the connection between the web browser and the Application Server is provided by standard HTTPS. It enables secure listener connections with an Oracle Database-provided encryption mechanism through the Secure Sockets Layer (SSL).

The Oracle Net connection between the *iSQL*Plus* Server and Oracle Database provides the same security as in previous client server architectures. It is recommended that you enable an Oracle Net listener password if possible. For more information about Oracle Net connection security, see the Oracle Database Net Services Administrator's Guide and the Oracle Advanced Security Administrator's Guide.

Enabling SSL with iSQL*Plus

You can enable security for the connection between the web browser and the iSQL*Plus Application Server using SSL.

To enable SSL for the iSQL*Plus Application Server, see [Enabling SSL with iSQL*Plus](#) on page 2-15.

For detailed information about SSL, see the *Oracle Application Server Containers for J2EE Security Guide*.

Administration Privileges

There are two modes of access to iSQL*Plus:

- Connect as a normal user.
Requires an Oracle Database account username and password entered in the iSQL*Plus Login screen.
- Connect as a SYSDBA or SYSOPER privileged user.
Requires an Oracle Database account username and password entered in the iSQL*Plus DBA Login screen, and an Application Server authentication username and password entered in a separate dialog.

Enabling DBA Access

To connect with SYSDBA or SYSOPER privileges, your username and password must be added to the iSQL*Plus authentication file for the iSQL*Plus Application Server. To enable DBA access, see [Enabling iSQL*Plus DBA Access](#) on page 2-13.

Enabling or Disabling Restricted Database Access

The restricted database parameter limits the databases that users can access in iSQL*Plus. When enabled, a dropdown list of available databases is displayed in place of the Connection Identifier text field on the Login screen. This enables greater security for iSQL*Plus Servers in hosted environments.

Connection identifiers are listed in the order defined by the iSQLPlusConnectIdList in the configuration file, *web.xml*.

For more information about restricted database access, see [Enabling Restricted Database Access](#) on page 2-12.

Security Usage Notes

The following notes may assist you in understanding and configuring iSQL*Plus:

- Once you have successfully logged in with SYSDBA or SYSOPER privileges and authenticated with your Application Server authentication username and password, you may not be required to re-authenticate to the Application Server until you restart your browser. However, you are still required to log in with your Oracle Database username and password.
- The Product User Profile (PUP) tables apply to each user in each database as for SQL*Plus client server installations.

See [PRODUCT_USER_PROFILE Table](#) on page 9-1 for more information about PUP tables.

- The global configuration file glogin.sql is read from the middle tier machine as for a client server installation. login.sql files are not read.

Database Administration with SQL*Plus

This chapter provides a brief overview of the database administration tools available in SQL*Plus, and discusses the following topics:

- [Overview](#)
- [Introduction to Database Startup and Shutdown](#)
- [Redo Log Files](#)
- [Database Recovery](#)

This chapter is intended for use by database administrators. You must have database administrator privileges to use this functionality.

For more information on database administration, see the *Oracle Database Concepts* manual.

Overview

Special operations such as starting up or shutting down a database are performed by a database administrator (DBA). The DBA has certain privileges that are not assigned to normal users. The commands outlined in this chapter would normally be used by a DBA.

For more information about security and roles in SQL*Plus, see [Chapter 9, "SQL*Plus Security"](#).

Introduction to Database Startup and Shutdown

An Oracle database may not always be available to all users. To open or close a database, or to start up or shut down an instance, you must have DBA privileges or be connected as SYSOPER or SYSDBA. Other users cannot change the current status of an Oracle database.

Database Startup

Starting a database involves three steps:

1. Starting an instance

An instance controls the background processes and the allocation of memory area to access an Oracle database.

2. Mounting the database

Mounting the database associates it with a previously started instance.

3. Opening the database

Opening the database makes it available for normal database operations.

For more information about database startup, see the *Oracle Database Concepts* guide. For more information about starting a database, see the [STARTUP](#) command on page 12-169.

Example 10–1 Starting an Instance

To start an Oracle Database instance, without mounting the database, enter

```
STARTUP NOMOUNT
```

Example 10–2 Mounting the Database

To start an instance, mount the database, but leave the database closed, enter

```
STARTUP MOUNT
```

Example 10–3 Opening the Database

To start an instance using the Oracle Database Server parameter file INITSALES.ORA, mount and open the database named SALES, and restrict access to database administrators, enter

```
STARTUP OPEN sales PFILE=INITSALES.ORA RESTRICT
```

where SALES is the database name specified in the DB_NAME parameter in the INITSALES.ORA parameter file.

Example 10–4 Opening the Database

To start an instance using the Oracle Database Server parameter file INITSALES.ORA, mount and open the database named SALES in exclusive mode, and restrict access to administrative personnel, enter

```
STARTUP OPEN sales PFILE=INITSALES.ORA EXCLUSIVE RESTRICT
```

where SALES is the database name specified in the DB_NAME parameter in the INITSALES.ORA parameter file.

Database Shutdown

Shutting down a database involves three steps:

1. Closing the database

When a database is closed, all database and recovery data in the SGA are written to the datafiles and redo log files, and all online datafiles are closed.

2. Dismounting the database

Dismounting the database disassociates the database from an instance and closes the control files of the database.

3. Shutting down the instance

Shutting down an instance reclaims the SGA from memory and terminates the background Oracle Database processes that constitute an Oracle Database instance.

For more information about database shutdown, see the *Oracle Database Concepts* guide. For information about stopping a database, see the [SHUTDOWN](#) command on page 12-163.

Example 10–5 Shutting Down the Database

To shut down the database normally after it has been opened and mounted, enter

```
SHUTDOWN
```

```
Database closed.
Database dismounted.
ORACLE instance shut down.
```

Redo Log Files

Every Oracle database has a set of two or more redo log files. The set of redo log files for a database is collectively referred to as the database's redo log.

The redo log is used to record changes made to data. If, for example, there is a database failure, the redo log is used to recover the database. To protect against a failure involving the redo log itself, Oracle Database has a mirrored redo log so that two or more copies of the redo log can be maintained on different disks.

ARCHIVELOG Mode

Operating a database in ARCHIVELOG mode enables the archiving of the online redo log.

The ARCHIVE LOG command enables a complete recovery from disk failure as well as instance failure, because all changes made to the database are permanently saved in an archived redo log.

For more information about redo log files and database archiving modes, see the *Oracle Database Concepts* manual, and the [ARCHIVE LOG](#) command on page 12-13.

To automatically begin archiving, enter

```
ARCHIVE LOG START
```

To list the details of the current log file being archived, enter

```
ARCHIVE LOG LIST
```

Database log mode	Archive Mode
Automatic archival	Enabled
Archive destination	/vobs/oracle/dbs/arch
Oldest online log sequence	221
Next log sequence to archive	222
Current log sequence	222

Database Recovery

If a damaged database is in ARCHIVELOG mode, it is a candidate for either complete media recovery or incomplete media recovery operations. To begin media recovery operations use the RECOVER command. For more information about recovering data, see the [RECOVER](#) command on page 12-74.

Because of possible network timeouts, it is recommended that you use SQL*Plus command-line, not *i*SQL*Plus, for long running DBA operations such as RECOVER.

In order to begin recovery operations, you must have DBA privileges.

To recover the database up to a specified time using a control backup file, enter

```
RECOVER DATABASE UNTIL TIME '1998-11-23:12:47:30' -  
USING BACKUP CONTROLFILE
```

To recover two offline tablespaces, enter

```
RECOVER TABLESPACE ts1, ts2
```

Make sure that the tablespaces you are interested in recovering have been taken offline, before proceeding with recovery for those tablespaces.

SQL*Plus Globalization Support

Globalization support enables the storing, processing and retrieval of data in native languages. The languages that can be stored in an Oracle database are encoded by Oracle Database-supported character sets. Globalization support ensures that database utilities, error messages, sort order, and date, time, monetary, numeric, and calendar conventions adjust to the native language and locale.

Topics:

- [Configuring Globalization Support in Command-line SQL*Plus](#)
- [Configuring Multiple Language Support in iSQL*Plus](#)
- [NLS_LANG Environment Variable](#)

For more information on globalization support, see the Oracle Technology Network globalization notes at <http://otn.oracle.com/tech/globalization/>, and see the *Oracle Database Globalization Support Guide*

Configuring Globalization Support in Command-line SQL*Plus

SQL*Plus supports multiple languages through the NLS_LANG environment variable. To display another language in SQL*Plus, before starting SQL*Plus you must configure:

- NLS_LANG in the SQL*Plus client environment.
- The Oracle Database during installation.

SQL*Plus Client

The SQL*Plus client environment is configured by setting the NLS_LANG environment variable which is read by SQL*Plus at startup.

Oracle Database

The Oracle Database environment is configured by creating the database with the required character set.

Configuring Multiple Language Support in iSQL*Plus

iSQL*Plus supports multiple languages through the Unicode UTF-8 character encoding in the web browser you use for the iSQL*Plus session, and through the AL32UTF8 encoding (Oracle's implementation of Unicode) in the iSQL*Plus Application Server serving the session.

If your Oracle Database also uses AL32UTF8, then there is a one-for-one correspondence between the character sets in the database and in *iSQL*Plus*. Otherwise some character mapping may occur.

Web Browser

The *iSQL*Plus* user interface can be displayed in a number of languages:

- Chinese (China) [zh-cn]
- Chinese (Taiwan) [zh-tw]
- French (France) [fr]
- German (Germany) [de]
- Italian (Italy) [it]
- Japanese [ja]
- Korean [ko]
- Portuguese (Brazil) [pt-br]
- Spanish (International/Traditional Sort) [es]

The *iSQL*Plus* user interface is automatically displayed in the language specified as your preferred language in your web browser.

To display the *iSQL*Plus* user interface in a language other than your existing web browser's preferred language, add the language to your web browser, then select the language to use. For example, to display the *iSQL*Plus* user interface in Japanese in Internet Explorer 6.0:

1. Start Internet Explorer.
2. Select **Tools > Internet Options > Languages... > Add**.
3. Select Japanese [ja] and click **OK**.
4. Select Japanese [ja] and click **Move Up** until it is at the top of the list.
5. Click **OK**.
6. Click **OK**.
7. Enter the *iSQL*Plus* URL. The *iSQL*Plus* user interface is now displayed in Japanese.

Your web browser must support UTF-8 character encoding. Most current web browsers support UTF-8.

Application Server

The language used for the output from *iSQL*Plus* queries is dependent on the language and territory values of the NLS_LANG environment variable in effect when the *iSQL*Plus* Application Server starts. The charset parameter is ignored and is always UTF8. The language and territory values are used for all *iSQL*Plus* sessions run from that application server. However, you can use an ALTER SESSION command to change the *language* and *territory* used for the duration of the current session. For example, to use Chinese language and conventions in your current session, enter

```
ALTER SESSION SET NLS_LANGUAGE='SIMPLIFIED CHINESE';  
ALTER SESSION SET NLS_TERRITORY='CHINA';
```

New pages served to your *iSQL*Plus* browser are now displayed with error messages and text fields in Chinese. Information is now displayed according to Chinese convention. This is a temporary change for the current login in the current *iSQL*Plus* session. To check what settings are currently in effect, enter:

```
SELECT * FROM NLS_SESSION_PARAMETERS;
```

The NLS_TERRITORY and NLS_LANGUAGE values correspond to the language and territory components of the NLS_LANG variable.

NLS_LANG Environment Variable

The NLS_LANG environment variable has three components, each controlling a subset of the globalization features.

Your operating system and keyboard must be able to support the character set you have chosen. You may need to install additional support software. For more information about NLS_LANG, and software support, see the *Oracle Database Globalization Support Guide*.

Setting up locale specific behavior on the SQL*Plus client is achieved with the use of NLS parameters. These parameters may be specified in a number of ways, including as an initialization parameter on the server. For settings that control the behavior of the server, see the *Oracle Database Globalization Support Guide*.

NLS_LANG has the syntax:

```
NLS_LANG = language_territory.charset
```

where *language* specifies the conventions to use for Oracle Database messages, sorting order, day and month names. For example, to receive messages in Japanese, set *language* to JAPANESE. If *language* is not set, it defaults to AMERICAN.

where *territory* specifies the convention for default dates, and for monetary, and numeric formats. For example to use the Japanese territory format, set *territory* to JAPAN. If *territory* is not set, the default value is derived from the language value, and so is set to AMERICA.

where, in SQL*Plus command-line, *charset* specifies the character set encoding used by SQL*Plus for data processing, and is generally suited to that of the users terminal. Illogical combinations can be set, but will not work. For example, Japanese cannot be supported using a Western European character set such as:

```
NLS_LANG=JAPANESE_JAPAN.WE8DEC
```

However, Japanese could be supported with the Unicode character set. For example:

```
NLS_LANG=JAPANESE_JAPAN.UTF8
```

charset is not used by the *iSQL*Plus* Application Server. The *iSQL*Plus* Application Server always uses AL32UTF8 character encoding, Oracle's implementation of Unicode. It cannot be changed.

Viewing NLS_LANG Settings

You can view the NLS_LANG setting by entering the SELECT command:

```
SELECT * FROM NLS_SESSION_PARAMETERS;
```

The NLS_TERRITORY and NLS_LANGUAGE values correspond to the language and territory components of the NLS_LANG variable.

You can also obtain a list of valid values for the NLS_SORT, NLS_LANGUAGE, NLS_TERRITORY and NLS_CHARACTERSET by querying the NLS dynamic performance view table V\$NLS_VALID_VALUES.

Setting NLS_LANG

You can set the NLS_LANG environment variable to control globalization features.

Example 11–1 Configuring Japanese Support in SQL*Plus on Windows

1. Ensure you have exited your current SQL*Plus session.
2. Open System from Start > Settings > Control Panel.
3. Click the Advanced tab and select Environment Variables.
4. Create a new environment variable, NLS_LANG, with a value of Japanese_Japan.JA16SJIS.
5. You may need to restart Windows for this setting to take effect.

Example 11–2 Configuring Japanese Support in SQL*Plus on UNIX

1. Ensure you have exited your current SQL*Plus session.
2. Set the NLS_LANG variable using either set or setenv depending on the UNIX shell you are using. For example, in csh, you would enter:

```
setenv NLS_LANG Japanese_Japan.UTF8
```

or

```
setenv NLS_LANG Japanese_Japan.JA16SJIS
```

or

```
setenv NLS_LANG Japanese_Japan.JA16EUC
```

The locale setting of your UNIX terminal determines the exact value of the NLS_LANG parameter. For more information on the NLS_LANG setting, see the Oracle Database Globalization Support Guide.

Example 11–3 Configuring Japanese Support in Oracle Database

To store data in the Japanese character set using UTF-8 character encoding, ensure that the Oracle database has been created with the AL32UTF8 character set. See your Oracle Database Installation Guide for information about creating your database in a character set other than US7ASCII.

Part III

SQL*Plus Reference

Part III contains the SQL*Plus command reference, and the list of SQL*Plus error messages.

Part III contains the following chapters:

- [SQL*Plus Command Reference](#)
- [SQL*Plus Error Messages](#)

SQL*Plus Command Reference

This chapter contains descriptions of the SQL*Plus commands listed alphabetically. Each description contains the following parts:

Section	Description
Syntax	Shows how to enter the command and provides a brief description of the basic uses of the command.
Terms	Describes the function of each term or clause appearing in the syntax.
Usage	Provides additional information on uses of the command and on how the command works.
Examples	Gives one or more examples of the command.

You can continue a long SQL*Plus command by typing a hyphen at the end of the line and pressing Return. If you wish, you can type a space before typing the hyphen. SQL*Plus displays a right angle-bracket (>) as a prompt for each additional line.

You do not need to end a SQL*Plus command with a semicolon. When you finish entering the command, you can press Return. If you wish, however, you can enter a semicolon at the end of a SQL*Plus command.

SQL*Plus Command Summary

Command	Page	Description
@	on page 12-5	Runs SQL*Plus statements in the specified script. The script can be called from the local file system or from a web server.
@@	on page 12-7	Runs a script. This command is similar to the @ ("at" sign) command. It is useful for running nested scripts because it has the additional functionality of looking for the specified script in the same path as the calling script.
/(slash)	on page 12-9	Executes the SQL command or PL/SQL block.
ACCEPT	on page 12-10	Reads a line of input and stores it in a given substitution variable.
*APPEND	on page 12-12	Adds specified text to the end of the current line in the buffer.
ARCHIVE LOG	on page 12-13	Starts or stops the automatic archiving of online redo log files, manually (explicitly) archives specified redo log files, or displays information about redo log files.
ATTRIBUTE	on page 12-16	Specifies display characteristics for a given attribute of an Object Type column, and lists the current display characteristics for a single attribute or all attributes.
BREAK	on page 12-18	Specifies where and how formatting will change in a report, or lists the current break definition.
BTITLE	on page 12-22	Places and formats a specified title at the bottom of each report page, or lists the current BTITLE definition.
*CHANGE	on page 12-24	Changes text on the current line in the buffer.
CLEAR	on page 12-26	Resets or erases the current clause or setting for the specified option, such as BREAKS or COLUMNS.
COLUMN	on page 12-28	Specifies display characteristics for a given column, or lists the current display characteristics for a single column or for all columns.
COMPUTE	on page 12-36	Calculates and prints summary lines, using various standard computations, on subsets of selected rows, or lists all COMPUTE definitions.
CONNECT	on page 12-41	Connects a given user to Oracle Database.
COPY	on page 12-43	Copies results from a query to a table in the same or another database.
DEFINE	on page 12-44	Specifies a substitution variable and assigns it a CHAR value, or lists the value and variable type of a single variable or all variables.
*DEL	on page 12-46	Deletes one or more lines of the buffer.
DESCRIBE	on page 12-51	Lists the column definitions for the specified table, view, or synonym or the specifications for the specified function or procedure.
DISCONNECT	on page 12-57	Commits pending changes to the database and logs the current user off Oracle Database, but does not exit SQL*Plus.

Command	Page	Description
*EDIT	on page 12-58	Invokes an operating system text editor on the contents of the specified file or on the contents of the buffer.
EXECUTE	on page 12-60	Executes a single PL/SQL statement.
EXIT	on page 12-61	Terminates SQL*Plus and returns control to the operating system.
*GET	on page 12-63	Loads a operating system file into the buffer.
HELP	on page 12-64	Accesses the SQL*Plus command-line help system.
*HOST	on page 12-65	Executes an operating system command without leaving SQL*Plus.
*INPUT	on page 12-66	Adds one or more new lines after the current line in the buffer.
LIST	on page 12-68	Lists one or more lines of the buffer.
PASSWORD	on page 12-70	Enables a password to be changed without echoing the password on an input device.
PAUSE	on page 12-71	Displays the specified text, then waits for the user to press Return.
PRINT	on page 12-72	Displays the current value of a bind variable.
PROMPT	on page 12-73	Sends the specified message to the user's screen.
QUIT	on page 12-61	Terminates SQL*Plus and returns control to the operating system. QUIT is identical to EXIT.
RECOVER	on page 12-74	Performs media recovery on one or more tablespaces, one or more datafiles, or the entire database.
REMARK	on page 12-81	Begins a comment in a script.
REPFOOTER	on page 12-82	Places and formats a specified report footer at the bottom of each report, or lists the current REPFOOTER definition.
REPHEADER	on page 12-84	Places and formats a specified report header at the top of each report, or lists the current REPHEADER definition.
RUN	on page 12-87	Lists and runs the SQL command or PL/SQL block currently stored in the buffer.
*SAVE	on page 12-88	Saves the contents of the buffer in an operating system file (a script).
SET	on page 12-89	Sets a system variable to alter the SQL*Plus environment for your current session.
SHOW	on page 12-159	Shows the value of a SQL*Plus system variable or the current SQL*Plus environment.
SHUTDOWN	on page 12-163	Shuts down a currently running Oracle Database instance.
*SPOOL	on page 12-165	Stores query results in an operating system file and, optionally, sends the file to a printer.

Command	Page	Description
START	on page 12-167	Runs the SQL*Plus statements in the specified script. The script can be called from a web server in <i>iSQL*Plus</i> , or from the local file system or a web server in SQL*Plus command-line.
STARTUP	on page 12-169	Starts an Oracle Database instance and optionally mounts and opens a database.
*STORE	on page 12-172	Saves attributes of the current SQL*Plus environment in an operating system script.
TIMING	on page 12-173	Records timing data for an elapsed period of time, lists the current timer's title and timing data, or lists the number of active timers.
TTITLE	on page 12-174	Places and formats a specified title at the top of each report page, or lists the current TTITLE definition.
UNDEFINE	on page 12-177	Deletes one or more substitution variables that you defined either explicitly (with the DEFINE command) or implicitly (with an argument to the START command).
VARIABLE	on page 12-178	Declares a bind variable that can be referenced in PL/SQL.
WHENEVER OSERROR	on page 12-185	Exits SQL*Plus if an operating system command generates an error. In <i>iSQL*Plus</i> , performs the specified action if an operating system command generates an error.
WHENEVER SQLERROR	on page 12-187	Exits SQL*Plus if a SQL command or PL/SQL block generates an error. In <i>iSQL*Plus</i> , performs the specified action if a SQL command or PL/SQL block generates an error.
XQUERY	on page 12-189	Runs an XQuery 1.0 statement.

*Indicates commands not available in *iSQL*Plus*.

@ ("at" sign)

Syntax

```
@{url | file_name[.ext] } [arg...]
```

Runs the SQL*Plus statements in the specified script. The script can be called from the local file system or from a web server. Only the *url* form is supported in *iSQL*Plus*. The @ command functions similarly to @@ and START.

Terms

url

Specifies the Uniform Resource Locator of a script to run on the specified web server. SQL*Plus supports HTTP and FTP protocols, but not HTTPS. HTTP authentication in the form `http://username:password@machine_name.domain...` is not supported in this release.

file_name[.ext]

Represents the script you wish to run. If you omit *ext*, SQL*Plus assumes the default command-file extension (normally SQL). For information on changing the default extension, see [SET SUF\[*FIX*\] {SQL | text}](#) on page 12-145.

When you enter `@file_name.ext`, SQL*Plus searches for a file with that filename and extension in the current default directory. If SQL*Plus does not find the file in the current directory, it searches a system-dependent path to find it. Some operating systems may not support the path search. See the platform-specific Oracle documentation provided for your operating system for specific information related to your operating system environment.

arg...

Represent data items you wish to pass to parameters in the script. If you enter one or more arguments, SQL*Plus substitutes the values into the parameters (&1, &2, and so forth) in the script. The first argument replaces each occurrence of &1, the second replaces each occurrence of &2, and so forth.

The @ command defines the parameters with the values given by the arguments; if you run the script again in this session, you can enter new arguments or omit the arguments to use the current values. For more information on using parameters, see [Substitution Variables in iSQL*Plus](#) on page 5-17.

Usage

All previous settings like COLUMN command settings stay in effect when the script starts. If the script changes any setting, this new value stays in effect after the script has finished.

You can include in a script any command you would normally enter interactively (typically, SQL, SQL*Plus commands, or PL/SQL blocks).

If the START command is disabled (see [Disabling SQL*Plus, SQL, and PL/SQL Commands](#) on page 9-3), this will also disable the @ command. See [START](#) on page 12-167 for information on the START command.

SQL*Plus removes the SQLTERMINATOR (a semicolon by default) before the @ command is issued. If you require a semicolon in your command, add a second

SQLTERMINATOR. See [SET SQLT\[ERMINATOR\] {; | c | ON | OFF}](#) on page 12-144 for more information.

Examples

To run a script named PRINTRPT with the extension SQL, enter

```
@PRINTRPT
```

To run a script named WKRPT with the extension QRY, enter

```
@WKRPT.QRY
```

You can run a script named YEAREND specified by a URL, and pass values to variables referenced in YEAREND in the usual way:

```
@HTTP://machine_name.domain:port/YEAREND.SQL VAL1 VAL2
```

```
@FTP://machine_name.domain:port/YEAREND.SQL VAL1 VAL2
```

On a web server configured to serve SQL reports, you could request SQL*Plus to execute a dynamic script with:

```
@HTTP://machine_name.domain:port/SCRIPTSERVER?ENDOFYEAR VAL1 VAL2
```

@@ (double "at" sign)

Syntax

```
@@{url|file_name.ext} [arg...]
```

Runs a script. This command is almost identical to the @ ("at" sign) command. When running nested scripts it looks for nested scripts in the same path or *url* as the calling script. Only the *url* form is supported in *iSQL*Plus*. The @@ command functions similarly to @ and START.

Terms

url

Specifies the Uniform Resource Locator of a script to run on the specified web server. *SQL*Plus* supports HTTP and FTP protocols, but not HTTPS. HTTP authentication in the form `http://username:password@machine_name.domain...` is not supported in this release.

file_name.ext

Represents the nested script you wish to run. If you omit *ext*, *SQL*Plus* assumes the default command-file extension (normally SQL). For information on changing the default extension, see [SET SUF\[*FIX*\] {SQL | text}](#) on page 12-145.

When you enter @@*file_name.ext* from within a script, *SQL*Plus* runs *file_name.ext* from the same directory as the script.

When you enter @@*file_name.ext* interactively, *SQL*Plus* runs *file_name.ext* from the current working directory or from the same *url* as the script from which it was called. If *SQL*Plus* does not find the file, it searches a system-dependent path to find the file. Some operating systems may not support the path search. See the platform-specific Oracle documentation provided for your operating system for specific information related to your operating system environment.

arg...

Represent data items you wish to pass to parameters in the script. If you enter one or more arguments, *SQL*Plus* substitutes the values into the parameters (&1, &2, and so forth) in the script. The first argument replaces each occurrence of &1, the second replaces each occurrence of &2, and so forth.

The @@ command defines the parameters with the values given by the arguments. If you run the script again in this session, you can enter new arguments or omit the arguments to use the current values. For more information on using parameters, see [Substitution Variables in *iSQL*Plus*](#) on page 5-17.

Usage

All previous settings like COLUMN command settings stay in effect when the script starts. If the script changes any setting, the new value stays in effect after the script has finished.

You can include in a script any command you would normally enter interactively (typically, SQL or *SQL*Plus* commands).

If the START command is disabled (see [Disabling *SQL*Plus*, SQL, and PL/SQL Commands](#) on page 9-3), this will also disable the @@ command. For more information, see the [SPOOL](#) command on page 12-165.

SQL*Plus removes the SQLTERMINATOR (a semicolon by default) before the @@ command is issued. A workaround for this is to add another SQLTERMINATOR. See [SET SQLT\[ERMINATOR\] {; | c | ON | OFF}](#) on page 12-144 for more information.

Examples

Suppose that you have the following script named PRINTRPT:

```
SELECT DEPARTMENT_ID, CITY FROM EMP_DETAILS_VIEW WHERE SALARY>12000;  
@EMPRPT.SQL  
@@ WKRPT.SQL
```

When you START PRINTRPT and it reaches the @ command, it looks for the script named EMPRPT in the current working directory and runs it. When PRINTRPT reaches the @@ command, it looks for the script named WKRPT in the same path as PRINTRPT and runs it.

Suppose that the same script PRINTRPT was located on a web server and you ran it with START HTTP://*machine_name.domain:port*/PRINTRPT. When it reaches the @ command, it looks for the script named EMPRPT in the current working directory and runs it. When PRINTRPT reaches the @@ command, it looks for the script named WKRPT in the same *url* as PRINTRPT, HTTP://*machine_name.domain:port*/WKRPT.SQL and runs it.

/ (slash)

Syntax

/(slash)

Executes the most recently executed SQL command or PL/SQL block which is stored in the SQL buffer.

The buffer has no command history and does not record SQL*Plus commands.

Usage

You can enter a slash (/) at the command prompt or at a line number prompt of a multi-line command, or in the input area of the *iSQL*Plus* Workspace.

The slash command functions similarly to RUN, but does not list the command.

Executing a SQL command or PL/SQL block using the slash command will not cause the current line number in the SQL buffer to change unless the command in the buffer contains an error. In that case, SQL*Plus changes the current line number to the number of the line containing the error.

Examples

Type the following SQL script:

```
SELECT CITY, COUNTRY_NAME
FROM EMP_DETAILS_VIEW
WHERE SALARY=12000;
```

Enter a slash (/) to re-execute the command in the buffer:

/

CITY	COUNTRY_NAME
-----	-----
Seattle	United States of America
Oxford	United Kingdom
Seattle	United States of America

ACCEPT

Syntax

ACC[EPT] *variable* [NUM[BER] | CHAR | DATE | BINARY_FLOAT | BINARY_DOUBLE] [FOR[MAT] *format*] [DEF[AULT] *default*] [PROMPT *text* | NOPR[OMPT]] [HIDE]

Reads a line of input and stores it in a given substitution variable.

In *iSQL*Plus*, displays the Input Required screen for you to enter a value for the substitution variable.

Terms

variable

Represents the name of the variable in which you wish to store a value. If *variable* does not exist, *SQL*Plus* creates it.

NUM[BER]

Makes the *variable* a NUMBER datatype. If the reply does not match the datatype, ACCEPT gives an error message and prompts again.

CHAR

Makes the *variable* a CHAR datatype. The maximum CHAR length is 240 bytes. If a multi-byte character set is used, one CHAR may be more than one byte in size.

DATE

Makes reply a valid DATE format. If the reply is not a valid DATE format, ACCEPT gives an error message and prompts again. The datatype is CHAR.

BINARY_FLOAT

Makes the *variable* a BINARY_FLOAT datatype. BINARY_FLOAT is a floating-point number that conforms substantially with the Institute for Electrical and Electronics Engineers (IEEE) Standard for Binary Floating-Point Arithmetic, IEEE Standard 754-1985.

BINARY_DOUBLE

Makes the *variable* a BINARY_DOUBLE datatype. BINARY_DOUBLE is a floating-point number that conforms substantially with the Institute for Electrical and Electronics Engineers (IEEE) Standard for Binary Floating-Point Arithmetic, IEEE Standard 754-1985.

FOR[MAT]

Specifies the input format for the reply. If the reply does not match the specified format, ACCEPT gives an error message and prompts again. If an attempt is made to enter more characters than are specified by the char format, an error message is given and the value must be reentered. If an attempt is made to enter a greater number precision than is specified by the number format, an error message is given and the value must be reentered. The format element must be a text constant such as A10 or 9.999. See [COLUMN FORMAT](#) on page 12-28 for a complete list of format elements.

Oracle Database date formats such as "dd/mm/yy" are valid when the datatype is DATE. DATE without a specified format defaults to the NLS_DATE_FORMAT of the current session. See the *Oracle Database Administrator's Guide* and the *Oracle Database SQL Reference* for information on Oracle Database date formats.

DEF[AULT]

Sets the default value if a reply is not given. The reply must be in the specified format if defined.

PROMPT *text*

Displays text on-screen before accepting the value of *variable* from the user.

NOPR[OMPT]

Skips a line and waits for input without displaying a prompt.

ACCEPT NOPR[OMPT] is not applicable in *iSQL*Plus*.

HIDE

Suppresses the display as you type the reply.

To display or reference variables, use the DEFINE command. See the [DEFINE](#) command on page 12-44 for more information.

Examples

To display the prompt "Password: ", place the reply in a CHAR variable named PSWD, and suppress the display, enter

```
ACCEPT pswd CHAR PROMPT 'Password: ' HIDE
```

To display the prompt "Enter weekly salary: " and place the reply in a NUMBER variable named SALARY with a default of 000.0, enter

```
ACCEPT salary NUMBER FORMAT '999.99' DEFAULT '000.0' -
PROMPT 'Enter weekly salary: '
```

To display the prompt "Enter date hired: " and place the reply in a DATE variable, HIRED, with the format "dd/mm/yyyy" and a default of "01/01/2003", enter

```
ACCEPT hired DATE FORMAT 'dd/mm/yyyy' DEFAULT '01/01/2003' -
PROMPT 'Enter date hired: '
```

To display the prompt "Enter employee lastname: " and place the reply in a CHAR variable named LASTNAME, enter

```
ACCEPT lastname CHAR FORMAT 'A20' -
PROMPT 'Enter employee lastname: '
```

APPEND

APPEND is not available in *iSQL*Plus*.

Syntax

A[PPEND] *text*

where *text* represents the text to append.

Adds specified text to the end of the current line in the SQL buffer. The buffer has no command history list and does not record SQL*Plus commands.

To separate *text* from the preceding characters with a space, enter two spaces between APPEND and *text*.

To APPEND text that ends with a semicolon, end the command with two semicolons (SQL*Plus interprets a single semicolon as an optional command terminator).

Examples

To append a comma delimiter, a space and the column name CITY to the first line of the buffer, make that line the current line by listing the line as follows:

1

```
1* SELECT DEPARTMENT_ID
```

Now enter APPEND:

```
APPEND , CITY
```

1

```
1* SELECT DEPARTMENT_ID, CITY
```

To append a semicolon to the line, enter

```
APPEND ;;
```

SQL*Plus appends the first semicolon to the line and interprets the second as the terminator for the APPEND command.

ARCHIVE LOG

Syntax

```
ARCHIVE LOG {LIST | STOP} | {START | NEXT | ALL | integer} [TO destination]
```

Starts or stops automatic archiving of online redo log files, manually (explicitly) archives specified redo log files, or displays information about redo log files.

Terms

LIST

Requests a display that shows the range of redo log files to be archived, the current log file group's sequence number, and the current archive destination (specified by either the optional command text or by the initialization parameter LOG_ARCHIVE_DEST).

If you are using both ARCHIVELOG mode and automatic archiving, the display might appear like:

```
ARCHIVE LOG LIST
```

Database log mode	Archive Mode
Automatic archival	Enabled
Archive destination	/vobs/oracle/dbs/arch
Oldest online log sequence	221
Next log sequence to archive	222
Current log sequence	222

Since the log sequence number of the current log group and the next log group to archive are the same, automatic archival has archived all log groups up to the current one.

If you are using ARCHIVELOG but have disabled automatic archiving, the last three lines might look like:

Oldest online log sequence	222
Next log sequence to archive	222
Current log sequence	225

If you are using NOARCHIVELOG mode, the "next log sequence to archive" line is suppressed.

The log sequence increments every time the Log Writer begins to write to another redo log file group; it does not indicate the number of logs being used. Every time an online redo log file group is reused, the contents are assigned a new log sequence number.

STOP

Disables automatic archival. If the instance is still in ARCHIVELOG mode and all redo log file groups fill, database operation is suspended until a redo log file is archived (for example, until you enter the command ARCHIVE LOG NEXT or ARCHIVE LOG ALL).

START

Enables automatic archiving. Starts the background process ARCH, which performs automatic archiving as required. If ARCH is started and a filename is supplied, the filename becomes the new default archive destination. ARCH automatically starts on instance startup if the initialization parameter LOG_ARCHIVE_START is set to TRUE.

NEXT

Manually archives the next online redo log file group that has been filled, but not yet archived.

ALL

Manually archives all filled, but not yet archived, online redo log file groups.

integer

Causes archival of the online redo log file group with log sequence number *n*. You can specify any redo log file group that is still online. An error occurs if the log file cannot be found online or the sequence number is not valid. This option can be used to re-archive a log file group.

destination

Specifies the destination device or directory in an operating system. Specification of archive destination devices is installation-specific; see your platform-specific Oracle Database documentation for examples of specifying archive destinations. On many operating systems, multiple log files can be spooled to the same tape.

If not specified in the command-line, the archive destination is derived from the initialization parameter LOG_ARCHIVE_DEST. The command ARCHIVE LOG START *destination* causes the specified device or directory to become the new default archive destination for all future automatic or manual archives. A destination specified with any other option is a temporary destination that is in effect only for the current (manual) archive. It does not change the default archive destination for subsequent automatic archives. For information about specifying archive destinations, see your platform-specific Oracle Database documentation.

Usage

You must be connected to an open Oracle database as SYSOPER, or SYSDBA. For information about connecting to the database, see the [CONNECT](#) command on page 12-41.

For information about specifying archive destinations, see your platform-specific Oracle Database documentation.

Note: This command only applies to the current instance. To specify archiving for a different instance or for all instances in a Real Application Cluster, use the SQL command ALTER SYSTEM. For more information about using SQL commands, see the *Oracle Database SQL Reference*.

Examples

To start up the archiver process and begin automatic archiving, using the archive destination specified in LOG_ARCHIVE_DEST, enter

```
ARCHIVE LOG START
```

To stop automatic archiving, enter

```
ARCHIVE LOG STOP
```

To archive the log file group with sequence number 1001 to the destination specified, enter

```
ARCHIVE LOG 1001 '/vobs/oracle/dbs/arch'
```

'arch' specifies the prefix of the filename on the destination device; the remainder of the filename is dependent on the initialization parameter LOG_ARCHIVE_FORMAT, which specifies the filename format for archived redo log files.

ATTRIBUTE

Syntax

ATTR[IBUTE] [*type_name.attribute_name* [*option ...*]]

where *option* represents one of the following clauses:

ALI[AS] *alias*

CLE[AR]

FOR[MAT] *format*

LIKE {*type_name.attribute_name* | *alias*}

ON | OFF

Specifies display characteristics for a given attribute of an Object Type column, such as the format of NUMBER data. Columns and attributes should not have the same names as they share a common namespace.

Also lists the current display characteristics for a single attribute or all attributes.

Enter ATTRIBUTE followed by *type_name.attribute_name* and no other clauses to list the current display characteristics for only the specified attribute. Enter ATTRIBUTE with no clauses to list all current attribute display characteristics.

Terms

type_name.attribute_name

Identifies the data item (typically the name of an attribute) within the set of attributes for a given object of Object Type, *type_name*.

If you select objects of the same Object Type, an ATTRIBUTE command for that *type_name.attribute_name* applies to all such objects you reference in that session.

ALI[AS] *alias*

Assigns a specified alias to a *type_name.attribute_name*, which can be used to refer to the *type_name.attribute_name* in other ATTRIBUTE commands.

CLE[AR]

Resets the display characteristics for the *attribute_name*. The format specification must be a text constant such as A10 or \$9,999—not a variable.

FOR[MAT] *format*

Specifies the display format of the column. The format specification must be a text constant such as A10 or \$9,999—not a variable.

LIKE {*type_name.attribute_name* | *alias*}

Copies the display characteristics of another attribute. LIKE copies only characteristics not defined by another clause in the current ATTRIBUTE command.

ON | OFF

Controls the status of display characteristics for a column. OFF disables the characteristics for an attribute without affecting the characteristics' definition. ON reinstates the characteristics.

Usage

You can enter any number of `ATTRIBUTE` commands for one or more attributes. All attribute characteristics set for each attribute remain in effect for the remainder of the session, until you turn the attribute `OFF`, or until you use the `CLEAR COLUMN` command. Thus, the `ATTRIBUTE` commands you enter can control an attribute's display characteristics for multiple `SQL SELECT` commands.

When you enter multiple `ATTRIBUTE` commands for the same attribute, `SQL*Plus` applies their clauses collectively. If several `ATTRIBUTE` commands apply the same clause to the same attribute, the last one entered will control the output.

Examples

To make the `LAST_NAME` attribute of the Object Type `EMPLOYEE_TYPE` twenty characters wide, enter

```
ATTRIBUTE EMPLOYEE_TYPE.LAST_NAME FORMAT A20
```

To format the `SALARY` attribute of the Object Type `EMPLOYEE_TYPE` so that it shows millions of dollars, rounds to cents, uses commas to separate thousands, and displays `$0.00` when a value is zero, enter

```
ATTRIBUTE EMPLOYEE_TYPE.SALARY FORMAT $9,999,990.99
```

BREAK

Syntax

BRE[AK] [ON *report_element* [*action* [*action*]]] ...

where *report_element* has the syntax {*column* | *expr* | ROW | REPORT}

and *action* has the syntax [SKI[P] *n* | [SKI[P]] PAGE]
[NODUP[LICATES] | DUP[LICATES]]

Specifies where changes occur in a report and the formatting action to perform, such as:

- suppressing display of duplicate values for a given column
- skipping a line each time a given column value changes
(In *iSQL*Plus*, only when Preformatted Output is ON)
- printing computed figures each time a given column value changes or at the end of the report.

See the [COMPUTE](#) command on page 12-36.

Enter BREAK with no clauses to list the current BREAK definition.

Terms

ON *column* [*action* [*action*]]

When you include actions, specifies actions for SQL*Plus to take whenever a break occurs in the specified column (called the break column). (*column* cannot have a table or view appended to it. To achieve this, you can alias the column in the SQL statement.) A break is one of three events, a change in the value of a column or expression, the output of a row, or the end of a report

When you omit actions, BREAK ON *column* suppresses printing of duplicate values in *column* and marks a place in the report where SQL*Plus will perform the computation you specify in a corresponding COMPUTE command.

You can specify ON *column* one or more times. If you specify multiple ON clauses, as in

```
BREAK ON DEPARTMENT_ID SKIP PAGE ON JOB_ID -
SKIP 1 ON SALARY SKIP 1
```

the first ON clause represents the outermost break (in this case, ON DEPARTMENT_ID) and the last ON clause represents the innermost break (in this case, ON SALARY). SQL*Plus searches each row of output for the specified breaks, starting with the outermost break and proceeding—in the order you enter the clauses—to the innermost. In the example, SQL*Plus searches for a change in the value of DEPARTMENT_ID, then JOB_ID, then SALARY.

Next, SQL*Plus executes actions beginning with the action specified for the innermost break and proceeding in reverse order toward the outermost break (in this case, from SKIP 1 for ON SALARY toward SKIP PAGE for ON DEPARTMENT_ID). SQL*Plus executes each action up to and including the action specified for the first break encountered in the initial search.

If, for example, in a given row the value of JOB_ID changes—but the values of DEPARTMENT_ID and SALARY remain the same—SQL*Plus skips two lines before

printing the row (one as a result of SKIP 1 ON SALARY and one as a result of SKIP 1 ON JOB_ID).

Whenever you use ON *column*, you should also use an ORDER BY clause in the SQL SELECT command. Typically, the columns used in the BREAK command should appear in the same order in the ORDER BY clause (although all columns specified in the ORDER BY clause need not appear in the BREAK command). This prevents breaks from occurring at meaningless points in the report.

If the BREAK command specified earlier in this section is used, the following SELECT command produces meaningful results:

```
SELECT DEPARTMENT_ID, JOB_ID, SALARY, LAST_NAME
FROM EMP_DETAILS_VIEW
WHERE SALARY > 12000
ORDER BY DEPARTMENT_ID, JOB_ID, SALARY, LAST_NAME;
```

All rows with the same DEPARTMENT_ID print together on one page, and within that page all rows with the same JOB_ID print in groups. Within each group of jobs, those jobs with the same SALARY print in groups. Breaks in LAST_NAME cause no action because LAST_NAME does not appear in the BREAK command.

In BREAK commands, nulls are considered equal to each other, but not equal to anything else. This is different to the treatment of nulls in WHERE clauses.

ON *expr* [*action* [*action*]]

When you include actions, specifies actions for SQL*Plus to take when the value of the expression changes.

When you omit actions, BREAK ON *expr* suppresses printing of duplicate values of *expr* and marks where SQL*Plus will perform the computation you specify in a corresponding COMPUTE command.

You can use an expression involving one or more table columns or an alias assigned to a report column in a SQL SELECT or SQL*Plus COLUMN command. If you use an expression in a BREAK command, you must enter *expr* exactly as it appears in the SELECT command. If the expression in the SELECT command is a+b, for example, you cannot use b+a or (a+b) in a BREAK command to refer to the expression in the SELECT command.

The information given for ON *column* also applies to ON *expr*.

ON ROW [*action* [*action*]]

When you include actions, specifies actions for SQL*Plus to take when a SQL SELECT command returns a row. The ROW break becomes the innermost break regardless of where you specify it in the BREAK command. You should always specify an action when you BREAK on a row.

ON REPORT [*action*]

Marks a place in the report where SQL*Plus will perform the computation you specify in a corresponding COMPUTE command. Use BREAK ON REPORT in conjunction with COMPUTE to print grand totals or other "grand" computed values.

The REPORT break becomes the outermost break regardless of where you specify it in the BREAK command.

Note that SQL*Plus will not skip a page at the end of a report, so you cannot use BREAK ON REPORT SKIP PAGE.

SKI[P] *n*

Skips *n* lines before printing the row where the break occurred. `BREAK SKIP n` does not work in `SET MARKUP HTML ON` mode or in *iSQL*Plus* unless `PREFORMAT` is `SET ON`.

`[SK|[P]] PAGE`

Skips the number of lines that are defined to be a page before printing the row where the break occurred. The number of lines per page can be set with the `PAGESIZE` clause of the `SET` command. Note that `PAGESIZE` only changes the number of lines that *SQL*Plus* considers to be a page. Therefore, `SKIP PAGE` may not always cause a physical page break, unless you have also specified `NEWPAGE 0`. Note also that if there is a break after the last row of data to be printed in a report, *SQL*Plus* will not skip the page.

`NODUP[LICATES]`

Prints blanks rather than the value of a break column when the value is a duplicate of the column's value in the preceding row.

`DUP[LICATES]`

Prints the value of a break column in every selected row.

Enter `BREAK` with no clauses to list the current break definition.

Usage

Each new `BREAK` command you enter replaces the preceding one.

To remove the `BREAK` command, use `CLEAR BREAKS`.

Examples

To produce a report that prints duplicate job values, prints the average of `SALARY`, and additionally prints the sum of `SALARY`, you could enter the following commands. (The example selects departments 50 and 80 and the jobs of clerk and salesman only.)

```
BREAK ON DEPARTMENT_ID ON JOB_ID DUPPLICATES
COMPUTE SUM OF SALARY ON DEPARTMENT_ID
COMPUTE AVG OF SALARY ON JOB_ID
SELECT DEPARTMENT_ID, JOB_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE JOB_ID IN ('SH_CLERK', 'SA_MAN')
AND DEPARTMENT_ID IN (50, 80)
ORDER BY DEPARTMENT_ID, JOB_ID;
```

DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY	
	50	SH_CLERK	Taylor	3200
		SH_CLERK	Fleaur	3100
		.		
		.		
		SH_CLERK	Gates	2900
DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY	
	50	SH_CLERK	Perkins	2500
		SH_CLERK	Bell	4000
		.		
		.		
		SH_CLERK	Grant	2600
		*****		-----
		avg		3215
DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY	

		*****		-----
		sum		64300
	80	SA_MAN	Russell	14000
		SA_MAN	Partners	13500
		SA_MAN	Errazuriz	12000
		SA_MAN	Cambrault	11000
		SA_MAN	Zlotkey	10500
		*****		-----
		avg		12200
DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY	

		*****		-----
		sum		61000
25 rows selected.				

BTITLE

Syntax

BTI[TLE] [*printspec* [*text* | *variable*] ...] | [ON | OFF]

where *printspec* represents one or more of the following clauses used to place and format the text:

BOLD

CE[NTER]

COL *n*

FORMAT *text*

LE[FT]

R[IGHT]

S[KIP] [*n*]

TAB *n*

Places and formats a specified title at the bottom of each report page, or lists the current BTITLE definition.

Enter BTITLE with no clauses to list the current BTITLE definition. For a description of the old form of BTITLE, see [BTI\[TLE\] text \(obsolete old form\)](#) on page C-2.

Terms

See the [TTITLE](#) command on page 12-174 for information on terms and clauses in the BTITLE command syntax.

Usage

If you do not enter a *printspec* clause before the first occurrence of *text*, BTITLE left justifies the text. SQL*Plus interprets BTITLE in the new form if a valid *printspec* clause (LEFT, SKIP, COL, and so on) immediately follows the command name.

SQL*Plus substitution variables (& variables) are expanded before BTITLE is executed. The resulting string is stored as the BTITLE text. During subsequent execution for each page of results, the expanded value of a variable may itself be interpreted as a variable with unexpected results.

You can avoid this double substitution in a BTITLE command by not using the & prefix for variables that are to be substituted on each page of results. If you want to use a substitution variable to insert unchanging text in a BTITLE, enclose it in quotes so that it is only substituted once.

Examples

To set a bottom title with CORPORATE PLANNING DEPARTMENT on the left and a date on the right, enter

```
BTITLE LEFT 'CORPORATE PLANNING DEPARTMENT' -  
RIGHT '1 JAN 2001'
```

To set a bottom title with CONFIDENTIAL in column 50, followed by six spaces and a date, enter

```
BTITLE COL 50 'CONFIDENTIAL'  
TAB 6  
'1 JAN 2001'
```

CHANGE

CHANGE is not available in *iSQL*Plus*.

Syntax

C[CHANGE] *sepchar old* [*sepchar* [*new* [*sepchar*]]]

Changes the first occurrence of the specified text on the current line in the buffer. The buffer has no command history list and does not record *SQL*Plus* commands.

Terms

sepchar

Represents any non-alphanumeric character such as "/" or "!". Use a *sepchar* that does not appear in *old* or *new*.

old

Represents the text you wish to change. CHANGE ignores case in searching for *old*. For example,

CHANGE /aq/aw

finds the first occurrence of "aq", "AQ", "aQ", or "Aq" and changes it to "aw". *SQL*Plus* inserts the *new* text exactly as you specify it.

If *old* is prefixed with "...", it matches everything up to and including the first occurrence of *old*. If it is suffixed with "...", it matches the first occurrence of *old* and everything that follows on that line. If it contains an embedded "...", it matches everything from the preceding part of *old* through the following part of *old*.

new

Represents the text with which you wish to replace *old*. If you omit *new* and, optionally, the second and third *sepchars*, CHANGE deletes *old* from the current line of the buffer.

Usage

CHANGE changes the first occurrence of the existing specified text on the current line of the buffer to the new specified text. The current line is marked with an asterisk (*) in the LIST output.

You can also use CHANGE to modify a line in the buffer that has generated an Oracle Database error. *SQL*Plus* sets the buffer's current line to the line containing the error so that you can make modifications.

To reenter an entire line, you can type the line number followed by the new contents of the line. If you specify a line number larger than the number of lines in the buffer and follow the number with text, *SQL*Plus* adds the text in a new line at the end of the buffer. If you specify zero ("0") for the line number and follow the zero with text, *SQL*Plus* inserts the line at the beginning of the buffer (that line becomes line 1).

Examples

Enter 3 so the current line of the buffer contains the following text:

3

```
3* WHERE JOB_ID IS IN ('CLERK', 'SA_MAN')
```

Enter the following command:

```
CHANGE /CLERK/SH_CLERK/
```

The text in the buffer changes as follows:

```
3* WHERE JOB_ID IS IN ('SH_CLERK', 'SA_MAN')
```

Or enter the following command:

```
CHANGE /'CLERK',... /'SH_CLERK' /
```

The original line changes to

```
3* WHERE JOB_ID IS IN ('SH_CLERK')
```

Or enter the following command:

```
CHANGE /(...)/('SA_MAN') /
```

The original line changes to

```
3* WHERE JOB_ID IS IN ('SA_MAN')
```

You can replace the contents of an entire line using the line number. This entry

```
3 WHERE JOB_ID IS IN ('SH_CLERK')
```

causes the second line of the buffer to be replaced with

```
WHERE JOB_ID IS IN ('SH_CLERK')
```

Note that entering a line number followed by a string will replace the line regardless of what text follows the line number. For example,

```
2 CHANGE/OLD/NEW/
```

will change the second line of the buffer to be

```
2* C/OLD/NEW/
```

CLEAR

Syntax

CL[EAR] *option* ...

where *option* represents one of the following clauses:

BRE[AKS]
BUFF[ER]
COL[UMNS]
COMP[UTES]
SCR[EEN]
SQL
TIMI[NG]

Resets or erases the current value or setting for the specified option.

CLEAR SCREEN is not available in *iSQL*Plus*.

Terms

BRE[AKS]

Removes the break definition set by the BREAK command.

BUFF[ER]

Clears text from the buffer. CLEAR BUFFER has the same effect as CLEAR SQL, unless you are using multiple buffers.

See [SET BUF\[FER\] {buffer | SQL} \(obsolete\)](#) on page C-2 for more information about the obsolete form of this command.

COL[UMNS]

Resets column display attributes set by the COLUMN command to default settings for all columns. To reset display attributes for a single column, use the CLEAR clause of the COLUMN command. CLEAR COLUMNS also clears the ATTRIBUTEs for that column.

COMP[UTES]

Removes all COMPUTE definitions set by the COMPUTE command.

SCR[EEN]

Clears your screen.

CLEAR SCREEN is not available in *iSQL*Plus*.

SQL

Clears the text from SQL buffer. CLEAR SQL has the same effect as CLEAR BUFFER, unless you are using multiple buffers.

See [SET BUF\[FER\] {buffer | SQL} \(obsolete\)](#) on page C-2 for more information about the obsolete form of this command.

TIMI[NG]

Deletes all timers created by the TIMING command.

Examples

To clear breaks, enter

```
CLEAR BREAKS
```

To clear column definitions, enter

```
CLEAR COLUMNS
```

COLUMN

Syntax

COL[UMN] [{*column* | *expr*} [*option* ...]]

where *option* represents one of the following clauses:

ALI[AS] *alias*
 CLE[AR]
 ENTMAP {ON | OFF}
 FOLD_A[FTER]
 FOLD_B[EFORE]
 FOR[MAT] *format*
 HEA[DING] *text*
 JUS[TIFY] {L[EFT] | C[ENTER] | R[IGHT]}
 LIKE {*expr* | *alias*}
 NEWL[INE]
 NEW_V[ALUE] *variable*
 NOPRI[NT] | PRI[NT]
 NUL[L] *text*
 OLD_V[ALUE] *variable*
 ON | OFF
 WRA[PPED] | WOR[D_WRAPPED] | TRU[NCATED]

Specifies display attributes for a given column, such as

- text for the column heading
- alignment of the column heading
- format for NUMBER data
- wrapping of column data

Also lists the current display attributes for a single column or all columns.

Enter COLUMN followed by *column* or *expr* and no other clauses to list the current display attributes for only the specified column or expression. Enter COLUMN with no clauses to list all current column display attributes.

Terms

{*column* | *expr*}

Identifies the data item (typically, the name of a column) in a SQL SELECT command to which the column command refers. If you use an expression in a COLUMN command, you must enter *expr* exactly as it appears in the SELECT command. If the expression in the SELECT command is a+b, for example, you cannot use b+a or (a+b) in a COLUMN command to refer to the expression in the SELECT command.

If you select columns with the same name from different tables, a COLUMN command for that column name will apply to both columns. That is, a COLUMN command for the column LAST_NAME applies to all columns named LAST_NAME that you reference in this session. COLUMN ignores table name prefixes in SELECT commands. Also, spaces are ignored unless the name is placed in double quotes.

To format the columns differently, assign a unique alias to each column within the SELECT command itself (do not use the ALIAS clause of the COLUMN command) and enter a COLUMN command for each column's alias.

AL[AS] *alias*

Assigns a specified alias to a column, which can be used to refer to the column in BREAK, COMPUTE, and other COLUMN commands.

CLE[AR]

Resets the display attributes for the column to default values.

To reset the attributes for all columns, use the CLEAR COLUMNS command. CLEAR COLUMNS also clears the ATTRIBUTES for that column.

ENTMAP {ON | OFF}

Enables entity mapping to be turned on or off for selected columns in HTML output. This feature enables you to include, for example, HTML hyperlinks in a column of data, while still mapping entities in other columns of the same report. By turning entity mapping off for a column containing HTML hyperlinks, the HTML anchor tag delimiters, <, >, " and &, are correctly interpreted in the report. Otherwise they would be replaced with their respective entities, <, >, " and &, preventing web browsers from correctly interpreting the HTML.

Entities in the column heading and any COMPUTE labels or output appearing in the column are mapped or not mapped according to the value of ENTMAP for the column.

The default setting for COLUMN ENTMAP is the current setting of the MARKUP HTML ENTMAP option.

For more information about the MARKUP HTML ENTMAP option, see [SET MARKUP Options](#) on page 3-14.

FOLD_A[FTER]

Inserts a carriage return after the column heading and after each row in the column. SQL*Plus does not insert an extra carriage return after the last column in the SELECT list. FOLD_A[FTER] does not work in SET MARKUP HTML ON mode or in *SQL*Plus* unless PREFORMAT is set ON.

FOLD_B[EFORE]

Inserts a carriage return before the column heading and before each row of the column. SQL*Plus does not insert an extra carriage return before the first column in the SELECT list. FOLD_A[FTER] does not work in SET MARKUP HTML ON mode or in *SQL*Plus* unless PREFORMAT is set ON.

FOR[MAT] *format*

Specifies the display format of the column. The format specification must be a text constant such as A10 or \$9,999.

Character Columns The default width of CHAR, NCHAR, VARCHAR2 (VARCHAR) and NVARCHAR2 (NCHAR VARYING) columns is the width of the column in the database. SQL*Plus formats these datatypes left-justified. If a value does not fit within the column width, SQL*Plus wraps or truncates the character string depending on the setting of SET WRAP.

A LONG, CLOB, NCLOB or XMLType column's width defaults to the value of SET LONGCHUNKSIZE or SET LONG, whichever one is smaller.

SQL*Plus truncates or wraps XMLType columns after 2000 bytes. To avoid this you need to set an explicit COLUMN format for the XMLType column. A COLUMN format can be up to a maximum of 60000 per row.

To change the width of a datatype to *n*, use `FORMAT An`. (A stands for alphabetic.) If you specify a width shorter than the column heading, SQL*Plus truncates the heading.

DATE Columns The default width and format of unformatted DATE columns in SQL*Plus is derived from the `NLS_DATE_FORMAT` parameter. The `NLS_DATE_FORMAT` setting is determined by the NLS territory parameter. For example, the default format for the NLS territory, America, is `DD-Mon-RR`, and the default width is `A9`. The NLS parameters may be set in your database parameter file, in environment variables or an equivalent platform-specific mechanism. They may also be specified for each session with the `ALTER SESSION` command. For more information about DATE formats, and about NLS parameters, see the *Oracle Database SQL Reference*.

You can change the format of any DATE column using the SQL function `TO_CHAR` in your SQL `SELECT` statement. You may also wish to use an explicit `COLUMN FORMAT` command to adjust the column width.

When you use SQL functions like `TO_CHAR`, Oracle Database automatically enables a very wide column. The default column width may also depend on the character sets in use in SQL*Plus and in the database. To maximize script portability if multiple character sets are used, Oracle Database recommends using `COLUMN FORMAT` for each column selected.

To change the width of a DATE column to *n*, use the `COLUMN` command with `FORMAT An`. If you specify a width shorter than the column heading, the heading is truncated.

NUMBER Columns For numeric columns, `COLUMN FORMAT` settings take precedence over `SET NUMFORMAT` settings, which take precedence over `SET NUMWIDTH` settings.

See [SET NUMF\[ORMAT\] format](#) on page 12-126 and [SET NUM\[WIDTH\] {10 | n}](#) on page 12-127.

To change a NUMBER column's width, use `FORMAT` followed by an element as specified in [Table 12–1, "Number Formats"](#).

Table 12–1 Number Formats

Element	Examples	Description
,	(comma) 9,999	Displays a comma in the specified position.
.	(period) 99.99	Displays a period (decimal point) to separate the integral and fractional parts of a number.
\$	\$9999	Displays a leading dollar sign.
0	0999 9990	Displays leading zeros Displays trailing zeros.
9	9999	Displays a value with the number of digits specified by the number of 9s. Value has a leading space if positive, a leading minus sign if negative. Blanks are displayed for leading zeroes. A zero (0) is displayed for a value of zero.
B	B9999	Displays blanks for the integer part of a fixed-point number when the integer part is zero, regardless of zeros in the format model.
C	C999	Displays the ISO currency symbol in the specified position.
D	99D99	Displays the decimal character to separate the integral and fractional parts of a number.
EEEE	9.999EEEE	Displays value in scientific notation (format must contain exactly four "E"s).

Table 12-1 (Cont.) Number Formats

Element	Examples	Description
G	9G999	Displays the group separator in the specified positions in the integral part of a number.
L	L999	Displays the local currency symbol in the specified position.
MI	9999MI	Displays a trailing minus sign after a negative value. Display a trailing space after a positive value.
PR	9999PR	Displays a negative value in <angle brackets>. Displays a positive value with a leading and trailing space.
RN rn	RN rn	Displays uppercase Roman numerals. Displays lowercase Roman numerals. Value can be an integer between 1 and 3999.
S	S9999 9999S	Displays a leading minus or plus sign. Displays a trailing minus or plus sign.
TM	TM	Displays the smallest number of decimal characters possible. The default is TM9. Fixed notation is used for output up to 64 characters, scientific notation for more than 64 characters. Cannot precede TM with any other element. TM can only be followed by a single 9 or E
U	U9999	Displays the dual currency symbol in the specified position.
V	999V99	Displays value multiplied by 10^n , where n is the number of 9's after the V.
X	XXXX xxxx	Displays the hexadecimal value for the rounded value of the specified number of digits.

The MI and PR format elements can only appear in the last position of a number format model. The S format element can only appear in the first or last position.

If a number format model does not contain the MI, S or PR format elements, negative return values automatically contain a leading negative sign and positive values automatically contain a leading space.

A number format model can contain only a single decimal character (D) or period (.), but it can contain multiple group separators (G) or commas (,). A group separator or comma cannot appear to the right of a decimal character or period in a number format model.

SQL*Plus formats NUMBER data right-justified. A NUMBER column's width equals the width of the heading or the width of the FORMAT plus one space for the sign, whichever is greater. If you do not explicitly use COLUMN FORMAT or SET NUMFORMAT, then the column's width will always be at least the value of SET NUMWIDTH.

SQL*Plus may round your NUMBER data to fit your format or field width.

If a value cannot fit in the column, SQL*Plus displays pound signs (#) instead of the number.

If a positive value is extremely large and a numeric overflow occurs when rounding a number, then the infinity sign (~) replaces the value. Likewise, if a negative value is extremely small and a numeric overflow occurs when rounding a number, then the negative infinity sign replaces the value (~-).

HEA[DING] *text*

Defines a column heading. If you do not use a `HEADING` clause, the column's heading defaults to *column* or *expr*. If *text* contains blanks or punctuation characters, you must enclose it with single or double quotes. Each occurrence of the `HEADSEP` character (by default, "|") begins a new line.

For example,

```
COLUMN LAST_NAME HEADING 'Employee |Name'
```

would produce a two-line column heading.

See [SET HEADS\[EP\] { | | c | ON | OFF}](#) on page 12-115 for information on changing the `HEADSEP` character.

```
JUS[TIFY] {L[EFT] | C[ENTER] | R[IGHT]}
```

Aligns the heading. If you do not use a `JUSTIFY` clause, headings for `NUMBER` columns default to `RIGHT` and headings for other column types default to `LEFT`.

```
LIKE {expr | alias}
```

Copies the display attributes of another column or expression (whose attributes you have already defined with another `COLUMN` command). `LIKE` copies only attributes not defined by another clause in the current `COLUMN` command.

```
NEWL[INE]
```

Starts a new line before displaying the column's value. `NEWLINE` has the same effect as `FOLD_BEFORE`. `NEWL[INE]` does not work in `SET MARKUP HTML ON` mode or in `SQL*Plus` unless `PREFORMAT` is `SET ON`.

```
NEW_V[ALUE] variable
```

Specifies a variable to hold a column value. You can reference the variable in `TTITLE` commands. Use `NEW_VALUE` to display column values or the date in the top title. You must include the column in a `BREAK` command with the `SKIP PAGE` action. The variable name cannot contain a pound sign (#).

`NEW_VALUE` is useful for master/detail reports in which there is a new master record for each page. For master/detail reporting, you must also include the column in the `ORDER BY` clause. See the example at the end of this command description.

Variables specified with `NEW_V[ALUE]` are expanded before `TTITLE` is executed. The resulting string is stored as the `TTITLE` text. During subsequent execution for each page of the report, the expanded value of a variable may itself be interpreted as a variable with unexpected results.

You can avoid this double substitution in a `TTITLE` command by not using the `&` prefix for `NEW_V[ALUE]` variables that are to be substituted on each page of the report. If you want to use a substitution variable to insert unchanging text in a `TTITLE`, enclose it in quotes so that it is only substituted once.

For information on displaying a column value in the bottom title, see `OLD_V[ALUE]` variable below. For more information on referencing variables in titles, see the [TTITLE](#) command on page 12-174. For information on formatting and valid format models, see [FOR\[MAT\]](#) format above.

```
NOPRI[NT] | PRI[NT]
```

Controls the printing of the column (the column heading and all the selected values). `NOPRINT` turns off the screen output and printing of the column. `PRINT` turns the printing of the column `ON`.

```
NUL[L] text
```

Controls the text SQL*Plus displays for null values in the given column. The default is a white space. SET NULL controls the text displayed for all null values for all columns, unless overridden for a specific column by the NULL clause of the COLUMN command. When a NULL value is selected, a variable's type always becomes CHAR so the SET NULL text can be stored in it.

`OLD_V[ALUE] variable`

Specifies a variable to hold a column value. You can reference the variable in BTITLE commands. Use OLD_VALUE to display column values in the bottom title. You must include the column in a BREAK command with the SKIP PAGE action.

OLD_VALUE is useful for master/detail reports in which there is a new master record for each page. For master/detail reporting, you must also include the column in the ORDER BY clause.

Variables specified with OLD_V[ALUE] are expanded before BTITLE is executed. The resulting string is stored as the BTITLE text. During subsequent execution for each page of the report, the expanded value of a variable may itself be interpreted as a variable with unexpected results.

You can avoid this double substitution in a BTITLE command by not using the & prefix for OLD_V[ALUE] variables that are to be substituted on each page of the report. If you want to use a substitution variable to insert unchanging text in a BTITLE, enclose it in quotes so that it is only substituted once.

For information on displaying a column value in the top title, see NEW_V[ALUE] variable. For more information on referencing variables in titles, see the TTITLE command on page 12-174.

`ON | OFF`

Controls the status of display attributes for a column. OFF disables the attributes for a column without affecting the attributes' definition. ON reinstates the attributes.

`WRA[PPED] | WOR[D_WRAPPED] | TRU[NCATED]`

Specifies how SQL*Plus will treat a datatype or DATE string that is too wide for a column. WRAPPED wraps the string within the column bounds, beginning new lines when required. When WORD_WRAP is enabled, SQL*Plus left justifies each new line, skipping all leading whitespace (for example, returns, newline characters, tabs and spaces), including embedded newline characters. Embedded whitespace not on a line boundary is not skipped. TRUNCATED truncates the string at the end of the first line of display.

NCLOB or multibyte CLOB columns cannot be formatted with the WORD_WRAPPED option. If you format an NCLOB or multibyte CLOB column with COLUMN WORD_WRAPPED, the column data behaves as though COLUMN WRAPPED was applied instead.

Usage

The COLUMN commands you enter can control a column's display attributes for multiple SQL SELECT commands.

You can enter any number of COLUMN commands for one or more columns. All column attributes set for each column remain in effect for the remainder of the session, until you turn the column OFF, or until you use the CLEAR COLUMN command.

When you enter multiple COLUMN commands for the same column, SQL*Plus applies their clauses collectively. If several COLUMN commands apply the same clause to the same column, the last one entered will control the output.

Examples

To make the LAST_NAME column 20 characters wide and display EMPLOYEE NAME on two lines as the column heading, enter

```
COLUMN LAST_NAME FORMAT A20 HEADING 'EMPLOYEE|NAME'
```

To format the SALARY column so that it shows millions of dollars, rounds to cents, uses commas to separate thousands, and displays \$0.00 when a value is zero, enter

```
COLUMN SALARY FORMAT $9,999,990.99
```

To assign the alias NET to a column containing a long expression, to display the result in a dollar format, and to display <NULL> for null values, you might enter

```
COLUMN SALARY+COMMISSION_PCT+BONUS-EXPENSES-INS-TAX ALIAS NET
COLUMN NET FORMAT $9,999,999.99 NULL '<NULL>'
```

Note that the example divides this column specification into two commands. The first defines the alias NET, and the second uses NET to define the format.

Also note that in the first command you must enter the expression exactly as you enter it in the SELECT command. Otherwise, SQL*Plus cannot match the COLUMN command to the appropriate column.

To wrap long values in a column named REMARKS, you can enter

```
COLUMN REMARKS FORMAT A20 WRAP
```

CUSTOMER	DATE	QUANTITY	REMARKS
-----	-----	-----	-----
123	25-AUG-2001	144	This order must be s hipped by air freigh t to ORD

If you replace WRAP with WORD_WRAP, REMARKS looks like this:

CUSTOMER	DATE	QUANTITY	REMARKS
-----	-----	-----	-----
123	25-AUG-2001	144	This order must be shipped by air freight to ORD

If you specify TRUNCATE, REMARKS looks like this:

CUSTOMER	DATE	QUANTITY	REMARKS
-----	-----	-----	-----
123	25-AUG-2001	144	This order must be s

To print the current date and the name of each job in the top title, enter the following. Use the EMPLOYEES table of the HR schema instead of EMP_DETAILS_VIEW.

For details on creating a date variable, see [Displaying the Current Date in Titles](#) on page 6-24.

Your two page report would look similar to the following report, with "Job Report" centered within your current linesize:

```

COLUMN JOB_ID NOPRINT NEW_VALUE JOBVAR
COLUMN TODAY  NOPRINT NEW_VALUE DATEVAR
BREAK ON JOB_ID SKIP PAGE ON TODAY
TTITLE CENTER 'Job Report' RIGHT DATEVAR  SKIP 2 -
LEFT 'Job:      ' JOBVAR SKIP 2
SELECT TO_CHAR(SYSDATE, 'MM/DD/YYYY') TODAY,
LAST_NAME, JOB_ID, MANAGER_ID, HIRE_DATE, SALARY, DEPARTMENT_ID
FROM EMPLOYEES WHERE JOB_ID IN ('MK_MAN', 'SA_MAN')
ORDER BY JOB_ID, LAST_NAME;

```

To change the default format of DATE columns to 'YYYY-MM-DD', you can enter

```
ALTER SESSION SET NLS_DATE_FORMAT = 'YYYY-MM-DD';
```

```
Session altered.
```

To display the change, enter a SELECT statement, such as:

```

SELECT HIRE_DATE
FROM EMPLOYEES
WHERE EMPLOYEE_ID = 206;

```

```

                                     Job Report                                     04/19/01

Job:      SA_MAN

HIRE_DATE
-----
1994-06-07

```

See the *Oracle Database SQL Reference* for information on the ALTER SESSION command.

COMPUTE

Syntax

```
COMP[UTE] [function [LAB[EL] text] ...
           OF {expr | column | alias} ...
           ON {expr | column | alias | REPORT | ROW} ...]
```

In combination with the BREAK command, calculates and prints summary lines, using various standard computations on subsets of selected rows. It also lists all COMPUTE definitions. For details on how to create summaries, see [Clarifying Your Report with Spacing and Summary Lines](#) on page 6-9.

Terms

function ...

Represents one of the functions listed in [Table 12-2, "COMPUTE Functions"](#). If you specify more than one function, use spaces to separate the functions.

COMPUTE command functions are always executed in the sequence AVG, COUNT, MINIMUM, MAXIMUM, NUMBER, SUM, STD, VARIANCE, regardless of their order in the COMPUTE command.

Table 12-2 COMPUTE Functions

Function	Computes	Applies to Datatypes
AVG	Average of non-null values	NUMBER
COU [NT]	Count of non-null values	all types
MIN [IMUM]	Minimum value	NUMBER, CHAR, NCHAR, VARCHAR2 (VARCHAR), NVARCHAR2 (NCHAR VARYING)
MAX [IMUM]	Maximum value	NUMBER, CHAR, NCHAR, VARCHAR2 (VARCHAR), NVARCHAR2 (NCHAR VARYING)
NUM [BER]	Count of rows	all types
SUM	Sum of non-null values	NUMBER
STD	Standard deviation of non-null values	NUMBER
VAR [IANCE]	Variance of non-null values	NUMBER

LAB[EL] *text*

Defines the label to be printed for the computed value. If no LABEL clause is used, *text* defaults to the unabbreviated function keyword. You must place single quotes around *text* containing spaces or punctuation. The label prints left justified and truncates to the column width or linesize, whichever is smaller. The maximum label length is 500 characters.

The label for the computed value appears in the break column specified. To suppress the label, use the NOPRINT option of the COLUMN command on the break column.

If you repeat a function in a COMPUTE command, SQL*Plus issues a warning and uses the first occurrence of the function.

With ON REPORT and ON ROW computations, the label appears in the first column listed in the SELECT statement. The label can be suppressed by using a NOPRINT column first in the SELECT statement. When you compute a function of the first column in the SELECT statement ON REPORT or ON ROW, then the computed value appears in the first column and the label is not displayed. To see the label, select a dummy column first in the SELECT list.

OF {*expr* | *column* | *alias*} ...

In the OF clause, you can refer to an expression or function reference in the SELECT statement by placing the expression or function reference in double quotes. Column names and aliases do not need quotes.

ON {*expr* | *column* | *alias* | REPORT | ROW} ...

If multiple COMPUTE commands reference the same column in the ON clause, only the last COMPUTE command applies.

To reference a SQL SELECT expression or function reference in an ON clause, place the expression or function reference in quotes. Column names and aliases do not need quotes.

Enter COMPUTE without clauses to list all COMPUTE definitions.

Usage

In order for the computations to occur, the following conditions must all be true:

- One or more of the expressions, columns, or column aliases you reference in the OF clause must also be in the SELECT command.
- The expression, column, or column alias you reference in the ON clause must occur in the SELECT command and in the most recent BREAK command.
- If you reference either ROW or REPORT in the ON clause, also reference ROW or REPORT in the most recent BREAK command.

To remove all COMPUTE definitions, use the CLEAR COMPUTES command.

Note that if you use the NOPRINT option for the column on which the COMPUTE is being performed, the COMPUTE result is also suppressed.

Examples

To subtotal the salary for the "account manager", AC_MGR, and "salesman", SA_MAN, job classifications with a compute label of "TOTAL", enter

```
BREAK ON JOB_ID SKIP 1;
COMPUTE SUM LABEL 'TOTAL' OF SALARY ON JOB_ID;
SELECT JOB_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE JOB_ID IN ('AC_MGR', 'SA_MAN')
ORDER BY JOB_ID, SALARY;
```

JOB_ID	LAST_NAME	SALARY
AC_MGR	Higgins	12000

TOTAL		12000
SA_MAN	Zlotkey	10500
	Cambault	11000
	Errazuriz	12000
	Partners	13500
	Russell	14000

TOTAL		61000

6 rows selected.

To calculate the total of salaries greater than 12,000 on a report, enter

```
COMPUTE SUM OF SALARY ON REPORT
BREAK ON REPORT
COLUMN DUMMY HEADING ''
SELECT ' ' DUMMY, SALARY, EMPLOYEE_ID
FROM EMP_DETAILS_VIEW
WHERE SALARY > 12000
ORDER BY SALARY;
```

SALARY	EMPLOYEE_ID
13000	201
13500	146
14000	145
17000	101
17000	102
24000	100

sum	98500

6 rows selected.

To calculate the average and maximum salary for the executive and accounting departments, enter

```
BREAK ON DEPARTMENT_NAME SKIP 1
COMPUTE AVG LABEL 'Dept Average' -
      MAX LABEL 'Dept Maximum' -
      OF SALARY ON DEPARTMENT_NAME
SELECT DEPARTMENT_NAME, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE DEPARTMENT_NAME IN ('Executive', 'Accounting')
ORDER BY DEPARTMENT_NAME;
```

DEPARTMENT_NAME	LAST_NAME	SALARY
Accounting	Higgins	12000
	Gietz	8300
*****		-----
Dept Average		10150
Dept Maximum		12000
Executive	King	24000
	Kochhar	17000
	De Haan	17000
*****		-----
Dept Average		19333.3333
Dept Maximum		24000

To sum salaries for departments <= 20 without printing the compute label, enter

```

COLUMN DUMMY NOPRINT
COMPUTE SUM OF SALARY ON DUMMY
BREAK ON DUMMY SKIP 1
SELECT DEPARTMENT_ID DUMMY, DEPARTMENT_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE DEPARTMENT_ID <= 20
ORDER BY DEPARTMENT_ID;

```

DEPARTMENT_ID	LAST_NAME	SALARY
10	Whalen	4400

		4400
20	Hartstein	13000
20	Fay	6000

		19000

To total the salary at the end of the report without printing the compute label, enter

```

COLUMN DUMMY NOPRINT
COMPUTE SUM OF SALARY ON DUMMY
BREAK ON DUMMY
SELECT NULL DUMMY, DEPARTMENT_ID, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE DEPARTMENT_ID <= 30
ORDER BY DEPARTMENT_ID;

```

DEPARTMENT_ID	LAST_NAME	SALARY
10	Whalen	4400
20	Hartstein	13000
20	Fay	6000
30	Raphaely	11000
30	Khoo	3100
30	Baida	2900
30	Tobias	2800
30	Himuro	2600
30	Colmenares	2500

		48300

9 rows selected.

CONNECT

Syntax

```
CONN[ECT] [{ logon | / } [AS {SYSOPER | SYSDBA}]]
```

```
CONN[ECT] [{ logon | / | proxy} [AS {SYSOPER | SYSDBA}]]
```

where *logon* has the syntax:

```
username[/password] [@connect_identifier]
```

where *proxy* has the syntax:

```
proxy user[username] [/password] [@connect_identifier]
```

Note: The brackets around *username* in *proxy* are required syntax, not an indication of an optional term. For example, to connect to `scott` through proxy user `hr` with password `welcome1`.

```
CONNECT hr[scott]/welcome1
```

Connects a given username to the Oracle Database. When you run a `CONNECT` command, the site profile, `glogin.sql`, and the user profile, `login.sql`, are executed.

`CONNECT` does not reprompt for username or password if the initial connection does not succeed.

Warning: Including your password in plain text is a security risk. You can avoid this risk by omitting the password, and entering it only when the system prompts for it.

To connect to a database using an enterprise user proxy, you must first configure the proxy. For information about configuring an enterprise user proxy, see the *Oracle Database Enterprise User Administrator's Guide*.

Terms

username[/password]

The username and password you use to connect to Oracle Database. If you omit *username* and *password*, SQL*Plus prompts you for them. If you enter a slash (/) or enter Return or click Execute when prompted for *username*, SQL*Plus logs you in using a default logon. See / (slash) on page 12-9 for more information.

If you omit only *password*, SQL*Plus prompts you for *password*. When prompting, SQL*Plus does not display *password* on your terminal screen.

See the [PASSWORD](#) command on page 12-70 for information about changing your password in SQL*Plus, and see [Changing Your Password in iSQL*Plus](#) on page 3-3 for information about changing passwords in iSQL*Plus.

connect_identifier

An Oracle Net connect identifier. The exact syntax depends on the Oracle Net configuration. For more information, refer to the Oracle Net manual or contact your DBA. SQL*Plus does not prompt for a service name, but uses your default database if you do not include a connect identifier.

/(slash)

Represents a default logon using operating system authentication. You cannot enter a connect_identifier if you use a default logon. In a default logon, SQL*Plus typically attempts to log you in using the username OPS\$name, where name is your operating system username. See the *Oracle Database Administrator's Guide* for information about operating system authentication.

In SQL*Plus command line, where applications use password credentials to connect to databases, it is possible to store the credentials in a client-side Oracle wallet. When you configure a client to use the Oracle wallet, applications can use the following syntax to connect to databases that use password authentication:

```
CONNECT /@database_alias
```

For information about configuring your client to use secure external password store and for information about managing credentials in it, see the *Oracle Database Security Guide*.

AS {SYSOPER | SYSDBA}

The AS clause enables privileged connections by users who have been granted SYSOPER or SYSDBA system privileges. You can use either of these privileged connections with the default logon, /.

For information about system privileges, see the *Oracle Database Administrator's Guide*.

Usage

CONNECT commits the current transaction to the database, disconnects the current username from Oracle Database, and reconnects with the specified username.

If you log on or connect as a user whose account has expired, SQL*Plus prompts you to change your password before you can connect.

If an account is locked, a message is displayed and connection into that account (as that user) is not permitted until the account is unlocked by your DBA.

For more information about user account management, refer to the CREATE USER, ALTER USER and the CREATE PROFILE commands in the *Oracle Database SQL Reference*.

Examples

To connect across Oracle Net with username HR, to the database known by the Oracle Net alias as FLEETDB, enter

```
CONNECT HR@FLEETDB
```

For more information about setting up your password file, refer to the *Oracle Database Administrator's Guide*.

To connect to an instance on the current node as a privileged user named HR, enter

```
CONNECT HR AS SYSDBA
```

To connect to an instance on the current node as a privileged default user, enter

```
CONNECT / AS SYSDBA
```

In the last two examples, your default schema becomes SYS.

COPY

The COPY command is not being enhanced to handle datatypes or features introduced with, or after Oracle8i. The COPY command is likely to be made obsolete in a future release.

For COPY command details and syntax, see [Appendix B, "SQL*Plus COPY Command"](#).

DEFINE

Syntax

```
DEF[INE] [variable] | [variable = text]
```

Specifies a user or predefined variable and assigns a CHAR value to it, or lists the value and variable type of a single variable or all variables.

Terms

variable

Represents the user or predefined variable whose value you wish to assign or list.

text

Represents the CHAR value you wish to assign to *variable*. Enclose *text* in single quotes if it contains punctuation or blanks.

variable = *text*

Defines (names) a substitution variable and assigns it a CHAR value.

Enter DEFINE followed by *variable* to list the value and type of *variable*. Enter DEFINE with no clauses to list the values and types of all substitution variables.

Usage

Defined variables retain their values until you:

- enter a new DEFINE command referencing the variable
- enter an UNDEFINE command referencing the variable
- enter an ACCEPT command referencing the variable
- reference the variable in the NEW_VALUE or OLD_VALUE clause of a COLUMN command and then reference the column in a SELECT command
- EXIT SQL*Plus

Whenever you run a stored query or script, SQL*Plus substitutes the value of *variable* for each substitution variable referencing *variable* (in the form `&variable` or `&&variable`). SQL*Plus will not prompt you for the value of *variable* in this session until you UNDEFINE *variable*.

If the value of a defined variable extends over multiple lines (using the SQL*Plus command continuation character), SQL*Plus replaces each continuation character and carriage return with a space. For example, SQL*Plus interprets

```
DEFINE TEXT = 'ONE-  
TWO-  
THREE'
```

as

```
DEFINE TEXT = 'ONE TWO THREE'
```

You should avoid defining variables with names that may be identical to values that you will pass to them, as unexpected results can occur. If a value supplied for a defined variable matches a variable name, then the contents of the matching variable are used instead of the supplied value.

Some variables are predefined when SQL*Plus starts. Enter DEFINE to see their definitions.

Examples

To assign the value MANAGER to the variable POS, type:

```
DEFINE POS = MANAGER
```

If you execute a command containing a reference to &POS, SQL*Plus substitutes the value MANAGER for &POS and will not prompt you for a POS value.

To assign the CHAR value 20 to the variable DEPARTMENT_ID, type:

```
DEFINE DEPARTMENT_ID = 20
```

Even though you enter the number 20, SQL*Plus assigns a CHAR value to DEPARTMENT_ID consisting of two characters, 2 and 0.

To list the definition of DEPARTMENT_ID, enter

```
DEFINE DEPARTMENT_ID
```

```
DEFINE DEPARTMENT_ID = "20" (CHAR)
```

This result shows that the value of DEPARTMENT_ID is 20.

Predefined Variables

There are eight variables defined during SQL*Plus installation. These variables only differ from user defined variables by having predefined values.

Table 12-3 Variables Predefined at SQL*Plus Installation

Variable Name	Contains
<code>_CONNECT_IDENTIFIER</code>	Connection identifier used to make connection, where available.
<code>_DATE</code>	Current date, or a user defined fixed string.
<code>_EDITOR</code>	Specifies the editor used by the EDIT command.
<code>_O_VERSION</code>	Current version of the installed Oracle Database.
<code>_O_RELEASE</code>	Full release number of the installed Oracle Database.
<code>_PRIVILEGE</code>	Privilege level of the current connection.
<code>_SQLPLUS_RELEASE</code>	Full release number of installed SQL*Plus component.
<code>_USER</code>	User name used to make connection.

`_CONNECT_IDENTIFIER`

Contains the connection identifier as supplied by the user to make a connection where it is available.

`_DATE`

Contains either the current date as a dynamic variable, or a fixed string. The current date is the default and is formatted using the value of `NLS_DATE_FORMAT`.

Because `_DATE` can be used as a normal substitution variable, users may put it in `TTITLE`. If `_DATE` is dynamic and is used in `TTITLE` it will have all the normal variable semantics. If it is used with an ampersand then the value will be set to the time when the `TTITLE` command is executed. If it is used without an ampersand prefix, it will be re-evaluated for each page. For long reports with `_DATE` in the `TTITLE` or with multiple references to `&_DATE`, different times may be displayed for each occurrence of the variable.

Users using `_DATE` in `TTITLEs` will almost certainly want to use an ampersand: `&_DATE`, so that each page of the report has exactly the same timestamp. This is especially true when the current date format contains a "seconds" component.

A `DEFINE` (with no arguments) or dereference using `&_DATE` will give the current date.

The `_DATE` value can be `UNDEFINED`, or set to a fixed string with an explicit `DEFINE _DATE`.

You can re-enable the default dynamic date behavior with:

```
DEFINE _DATE = "" (an empty string)
```

`_DATE` enables time values to be included in your SQL*Plus prompt.

`_EDITOR`

Specifies the default editor used by the `EDIT` command.

During SQL*Plus installation on Windows operating systems, it is set to Notepad. On UNIX operating systems, it is set to the value of the UNIX environment variable, EDITOR, if it exists, otherwise it is set to Ed.

You can use the DEFINE command to redefine _EDITOR, to hold the name of your preferred text editor. For example, to define the editor used by EDIT to be vi, enter the following command:

```
DEFINE _EDITOR = vi
```

_O_VERSION

Contains the current version of the installed Oracle Database in the form:

Oracle Database 10g Release 10.2.0.1.0 - Production

_O_RELEASE

Contains the full release number of the installed Oracle Database in the form:

102010000

_PRIVILEGE

Contains a value indicating the privilege level of the current connection. It contains one of the following values:

- AS SYSDBA
- AS SYSOPER
- An empty string for normal-user connections or when there is no connection.

AS SYSDBA and AS SYSOPER are database administrator level privileges.

See Also: *Oracle Database SQL Reference* for information on AS SYSDBA and AS SYSOPER privileges.

_SQLPLUS_RELEASE

Contains the full release number of the installed SQL*Plus component in the form:

101020000

_USER

Contains the user name connected to the current connection.

You can view the value of each of these variables with the DEFINE command.

These variables can be accessed and redefined like any other substitution variable. They can be used in TTITLE, in '&' substitution variables, or in your SQL*Plus command-line prompt.

You can use the DEFINE command to view the definitions of these eight predefined variables in the same way as you view other DEFINE definitions. You can also use the DEFINE command to redefine their values, or you can use the UNDEFINE command to remove their definitions and make them unavailable.

To view a specific variable definition, enter

```
DEFINE variable
```

where *variable* is the name of the substitution variable whose definition you want to view.

To view all predefined and user defined variable definitions, enter

```
DEFINE
```

All predefined and all user defined variable definitions are displayed.

You can use UNDEFINE to remove a substitution variable definition and make it unavailable.

Examples of Use of Predefined Variables

To change your SQL*Plus prompt to display your connection identifier, enter:

```
SET SQLPROMPT '_CONNECT_IDENTIFIER > '
```

To view the predefined value of the `_SQLPLUS_RELEASE` substitution variable, enter

```
DEFINE _SQLPLUS_RELEASE
```

```
DEFINE _SQLPLUS_RELEASE = "101000100" (CHAR)
```

DEL

DEL is not available in *iSQL*Plus*.

Syntax

```
DEL [n | n m | n* | n LAST | * | * n | * LAST | LAST]
```

Deletes one or more lines of the buffer.

SQL*Plus commands are not stored in the buffer. There is no history of commands previously entered in the buffer.

Terms

Term	Description
<i>n</i>	Deletes line <i>n</i> .
<i>n m</i>	Deletes lines <i>n</i> through <i>m</i> .
<i>n*</i>	Deletes line <i>n</i> through the current line.
<i>n LAST</i>	Deletes line <i>n</i> through the last line.
*	Deletes the current line.
* <i>n</i>	Deletes the current line through line <i>n</i> .
* LAST	Deletes the current line through the last line.
LAST	Deletes the last line.

Enter DEL with no clauses to delete the current line of the buffer.

Usage

DEL makes the following line of the buffer (if any) the current line. You can enter DEL several times to delete several consecutive lines.

Note: DEL is a SQL*Plus command and DELETE is a SQL command. For more information about the SQL DELETE command, see the *Oracle Database SQL Reference*.

Examples

Assume the SQL buffer contains the following query:

```
SELECT LAST_NAME, DEPARTMENT_ID
FROM EMP_DETAILS_VIEW
WHERE JOB_ID = 'SA_MAN'
ORDER BY DEPARTMENT_ID;
```

To make the line containing the WHERE clause the current line, you could enter

```
LIST 3
```

```
3* WHERE JOB_ID = 'SA_MAN'
```

followed by

DEL

The SQL buffer now contains the following lines:

```
SELECT LAST_NAME, DEPARTMENT_ID
FROM EMP_DETAILS_VIEW
ORDER BY DEPARTMENT_ID
```

To delete the third line of the buffer, enter

DEL 3

The SQL buffer now contains the following lines:

```
SELECT LAST_NAME, DEPARTMENT_ID
FROM EMP_DETAILS_VIEW
```

DESCRIBE

Syntax

DESC[RIBE] {[*schema*.]*object*[@ *db_link*]}

Lists the column definitions for the specified table, view or synonym, or the specifications for the specified function or procedure.

Terms

schema

Represents the schema where the object resides. If you omit *schema*, SQL*Plus assumes you own object.

object

Represents the table, view, type, procedure, function, package or synonym you wish to describe.

@ *db_link*

Consists of the database link name corresponding to the database where *object* exists. For more information on which privileges allow access to another table in a different schema, refer to the *Oracle Database SQL Reference*.

Usage

The description for tables, views, types and synonyms contains the following information:

- each column's name
- whether or not null values are allowed (NULL or NOT NULL) for each column
- datatype of columns, for example, CHAR, DATE, LONG, LONGRAW, NUMBER, RAW, ROWID, VARCHAR2 (VARCHAR), or XMLType
- precision of columns (and scale, if any, for a numeric column)

When you do a DESCRIBE, VARCHAR columns are returned with a type of VARCHAR2.

The DESCRIBE command enables you to describe objects recursively to the depth level set in the SET DESCRIBE command. You can also display the line number and indentation of the attribute or column name when an object contains multiple object types. For more information, see the SET command.

To control the width of the data displayed, use the SET LINESIZE command.

Columns output for the DESCRIBE command are typically allocated a proportion of the linesize currently specified. Decreasing or increasing the linesize with the SET LINESIZE command usually makes each column proportionally smaller or larger. This may give unexpected text wrapping in your display. For more information, see the SET command.

The description for functions and procedures contains the following information:

- the type of PL/SQL object (function or procedure)
- the name of the function or procedure
- the type of value returned (for functions)

- the argument names, types, whether input or output, and default values, if any
- the ENCRYPT keyword to indicate whether or not data in a column is encrypted

Examples

To describe the view EMP_DETAILS_VIEW, enter

```
DESCRIBE EMP_DETAILS_VIEW
```

Name	Null?	Type
EMPLOYEE_ID	NOT NULL	NUMBER(6)
JOB_ID	NOT NULL	VARCHAR2(10)
MANAGER_ID		NUMBER(6)
DEPARTMENT_ID		NUMBER(4)
LOCATION_ID		NUMBER(4)
COUNTRY_ID		CHAR(2)
FIRST_NAME		VARCHAR2(20)
LAST_NAME	NOT NULL	VARCHAR2(25)
SALARY		NUMBER(8,2)
COMMISSION_PCT		NUMBER(2,2)
DEPARTMENT_NAME	NOT NULL	VARCHAR2(30)
JOB_TITLE	NOT NULL	VARCHAR2(35)
CITY	NOT NULL	VARCHAR2(30)
STATE_PROVINCE		VARCHAR2(25)
COUNTRY_NAME		VARCHAR2(40)
REGION_NAME		VARCHAR2(25)

To describe a procedure called CUSTOMER_LOOKUP, enter

```
DESCRIBE customer_lookup
```

Argument Name	Type	In/Out	Default?
CUST_ID	NUMBER	IN	
CUST_NAME	VARCHAR2	OUT	

To create and describe the package APACK that contains the procedures aproc and bproc, enter

```
CREATE PACKAGE apack AS
PROCEDURE aproc(P1 CHAR, P2 NUMBER);
PROCEDURE bproc(P1 CHAR, P2 NUMBER);
END apack;
/
```

```
Package created.
```

```
DESCRIBE apack
```

PROCEDURE APROC		
Argument Name	Type	In/Out Default?

P1	CHAR	IN
P2	NUMBER	IN
PROCEDURE BPROC		
Argument Name	Type	In/Out Default?

P1	CHAR	IN
P2	NUMBER	IN

To create and describe the object type ADDRESS that contains the attributes STREET and CITY, enter

```
CREATE TYPE ADDRESS AS OBJECT
  ( STREET VARCHAR2(20),
    CITY VARCHAR2(20)
  );
/
```

Type created.

DESCRIBE address

Name	Null?	Type

STREET		VARCHAR2(20)
CITY		VARCHAR2(20)

To create and describe the object type EMPLOYEE that contains the attributes LAST_NAME, EMPADDR, JOB_ID and SALARY, enter

```
CREATE TYPE EMPLOYEE AS OBJECT
(LAST_NAME VARCHAR2(30),
EMPADDR ADDRESS,
JOB_ID VARCHAR2(20),
SALARY NUMBER(7,2)
);
/
```

Type created.

DESCRIBE employee

Name	Null?	Type

LAST_NAME		VARCHAR2(30)
EMPADDR		ADDRESS
JOB_ID		VARCHAR2(20)
SALARY		NUMBER(7,2)

To create and describe the object type addr_type as a table of the object type ADDRESS, enter

```
CREATE TYPE addr_type IS TABLE OF ADDRESS;
```

/

Type created.

DESCRIBE addr_type

addr_type TABLE OF ADDRESS	Null?	Type
Name		
-----	-----	-----
STREET		VARCHAR2 (20)
CITY		VARCHAR2 (20)

To create and describe the object type addr_varray as a varray of the object type ADDRESS, enter

```
CREATE TYPE addr_varray AS VARRAY(10) OF ADDRESS;
/
```

Type created.

DESCRIBE addr_varray

addr_varray VARRAY(10) OF ADDRESS	Null?	Type
Name		
-----	-----	-----
STREET		VARCHAR2 (20)
CITY		VARCHAR2 (20)

To create and describe the table department that contains the columns DEPARTMENT_ID, PERSON and LOC, enter

```
CREATE TABLE department
(DEPARTMENT_ID NUMBER,
PERSON EMPLOYEE,
LOC NUMBER
);
/
```

Table created.

DESCRIBE department

Name	Null?	Type
-----	-----	-----
DEPARTMENT_ID		NUMBER
PERSON		EMPLOYEE
LOC		NUMBER

To create and describe the object type rational that contains the attributes NUMERATOR and DENOMINATOR, and the METHOD rational_order, enter

```
CREATE OR REPLACE TYPE rational AS OBJECT
(NUMERATOR NUMBER,
DENOMINATOR NUMBER,
```

```

MAP MEMBER FUNCTION rational_order -
RETURN DOUBLE PRECISION,
PRAGMA RESTRICT_REFERENCES
(rational_order, RNDS, WNDS, RNPS, WNPS) );
/
CREATE OR REPLACE TYPE BODY rational AS OBJECT
MAP MEMBER FUNCTION rational_order -
RETURN DOUBLE PRECISION IS
BEGIN
    RETURN NUMERATOR/DENOMINATOR;
END;
END;
/
DESCRIBE rational

```

Name	Null?	Type
-----	-----	-----
NUMERATOR		NUMBER
DENOMINATOR		NUMBER
METHOD		

MAP MEMBER FUNCTION RATIONAL_ORDER RETURNS NUMBER		

To create a table which contains a column of XMLType, and describe it, enter

```
CREATE TABLE PROPERTY (Price NUMBER, Description SYS.XMLTYPE);
```

```
Table created
```

```
DESCRIBE PROPERTY;
```

Name	Null?	Type
-----	-----	-----
PRICE		NUMBER
DESCRIPTION		SYS.XMLTYPE

To format the DESCRIBE output use the SET command as follows:

```

SET LINESIZE 80
SET DESCRIBE DEPTH 2
SET DESCRIBE INDENT ON
SET DESCRIBE LINE OFF

```

To display the settings for the object, use the SHOW command as follows:

```
SHOW DESCRIBE
```

```
DESCRIBE DEPTH 2 LINENUM OFF INDENT ON
```

```
DESCRIBE employee
```

Name	Null?	Type
FIRST_NAME		VARCHAR2 (30)
EMPADDR		ADDRESS
STREET		VARCHAR2 (20)
CITY		VARCHAR2 (20)
JOB_ID		VARCHAR2 (20)
SALARY		NUMBER (7, 2)

To create and describe the table `des2_table` which contains an encrypted column `col2`, enter

```
CREATE TABLE des2_table (
col1 VARCHAR2(10),
col2 VARCHAR2(15) ENCRYPT,
col3 CHAR(5),
col4 CHAR(20));
```

Table created

```
DESCRIBE des2_table;
```

Name	Null?	Type
COL1		VARCHAR2 (10)
COL2		VARCHAR2 (15) ENCRYPT
COL3		CHAR (5)
COL4		CHAR (20)

For more information on using the `CREATE TYPE` command, see your *Oracle Database SQL Reference*.

For information about using the `SET DESCRIBE` and `SHOW DESCRIBE` commands, see the [SET](#) command on page 12-89 and the [SHOW](#) command on page 12-159.

DISCONNECT

Syntax

```
DISC[ONNECT]
```

Commits pending changes to the database and logs the current username out of Oracle Database, but does not exit SQL*Plus.

Usage

Use DISCONNECT within a script to prevent user access to the database when you want to log the user out of Oracle Database but have the user remain in SQL*Plus. In SQL*Plus command-line, use EXIT or QUIT to log out of Oracle Database and return control to your computer's operating system. In *iSQL*Plus*, click the Logout button to log out of Oracle Database.

Examples

Your script might begin with a CONNECT command and end with a DISCONNECT, as shown later.

```
CONNECT HR
SELECT LAST_NAME, DEPARTMENT_NAME FROM EMP_DETAILS_VIEW;
DISCONNECT
SET INSTANCE FIN2
CONNECT HR2
```

EDIT

EDIT is not available in *iSQL*Plus*.

Syntax

```
ED[IT] [file_name [.ext]]
```

where *file_name* [.ext] represents the file you wish to edit (typically a script).

Invokes an operating system text editor on the contents of the specified file or on the contents of the buffer. The buffer has no command history list and does not record SQL*Plus commands.

Enter EDIT with no *filename* to edit the contents of the SQL buffer with the operating system text editor.

Usage

If you omit the file extension, SQL*Plus assumes the default command-file extension (normally SQL). For information on changing the default extension, see the SUFFIX variable of the SET command.

If you specify a *filename*, SQL*Plus searches for the file in the directory set by ORACLE_PATH. If SQL*Plus cannot find the file in ORACLE_PATH, or if ORACLE_PATH is not set, it searches for the file in the current working directory. If SQL*Plus cannot find the file in either directory, it creates a file with the specified name.

The substitution variable, _EDITOR, contains the name of the text editor invoked by EDIT. You can change the text editor by changing the value of _EDITOR. For information about changing the value of a substitution variable, see [DEFINE](#) on page 12-44. EDIT attempts to run the default operating system editor if _EDITOR is undefined.

EDIT places the contents of the SQL buffer in a file named AFIEDT.BUF by default (in your current working directory) and runs the text editor on the contents of the file. If the file AFIEDT.BUF already exists, it is overwritten with the contents of the buffer. You can change the default filename by using the SET EDITFILE command. For more information about setting a default filename for the EDIT command, see the EDITFILE variable of the SET command.

Note: The default file, AFIEDT.BUF, may have a different name on some operating systems.

If you do not specify a filename and the buffer is empty, EDIT returns an error message.

To leave the editing session and return to SQL*Plus, terminate the editing session in the way customary for the text editor. When you leave the editor, SQL*Plus loads the contents of the file into the buffer.

Note: In Windows, if you use WordPad as your editor (_EDITOR=write.exe), the buffer is not reloaded when you exit WordPad. In this case, use GET to reload the buffer.

Examples

To edit the file REPORT with the extension SQL using your operating system text editor, enter

```
EDIT REPORT
```

EXECUTE

Syntax

EXEC[UTE] *statement*

where *statement* represents a PL/SQL statement.

Executes a single PL/SQL statement. The EXECUTE command is often useful when you want to execute a PL/SQL statement that references a stored procedure. For more information on PL/SQL, see your *Oracle Database PL/SQL User's Guide and Reference*.

Usage

If your EXECUTE command cannot fit on one line because of the PL/SQL statement, use the SQL*Plus continuation character (a hyphen).

The length of the command and the PL/SQL statement cannot exceed the length defined by SET LINESIZE.

You can suppress printing of the message "PL/SQL procedure successfully completed" with SET FEEDBACK OFF.

Examples

If the variable *n* has been defined with:

```
VARIABLE n NUMBER
```

The following EXECUTE command assigns a value to the bind variable *n*:

```
EXECUTE :n := 1
```

```
PL/SQL procedure successfully completed.
```

For information on how to create a bind variable, see the [VARIABLE](#) command on page 12-178.

EXIT

Syntax

{EXIT | QUIT} [SUCCESS | FAILURE | WARNING | *n* | *variable* | *:BindVariable*] [COMMIT | ROLLBACK]

Commits or rolls back all pending changes, logs out of Oracle Database, terminates SQL*Plus and returns control to the operating system.

In *iSQL*Plus*, commits or rolls back all pending changes, stops processing the current *iSQL*Plus* script and returns focus to the Input area. There is no way to access the return code in *iSQL*Plus*. In *iSQL*Plus* click the Logout button to exit the Oracle Database.

Commit on exit, or commit on termination of processing in *iSQL*Plus*, is performed regardless of the status of SET AUTOCOMMIT.

Terms

{EXIT | QUIT}

Can be used interchangeably (QUIT is a synonym for EXIT).

SUCCESS

Exits normally.

FAILURE

Exits with a return code indicating failure.

WARNING

Exits with a return code indicating warning.

COMMIT

Saves pending changes to the database before exiting.

n

Represents an integer you specify as the return code.

variable

Represents a user-defined or system variable (but not a bind variable), such as SQL.SQLCODE. EXIT *variable* exits with the value of *variable* as the return code.

:BindVariable

Represents a variable created in SQL*Plus with the VARIABLE command, and then referenced in PL/SQL, or other subprograms. *:BindVariable* exits the subprogram and returns you to SQL*Plus.

ROLLBACK

Executes a ROLLBACK statement and abandons pending changes to the database before exiting.

EXIT with no clauses commits and exits with a value of SUCCESS.

Usage

EXIT enables you to specify an operating system return code. This enables you to run SQL*Plus scripts in batch mode and to detect programmatically the occurrence of an unexpected event. The manner of detection is operating-system specific.

The key words SUCCESS, WARNING, and FAILURE represent operating-system dependent values. On some systems, WARNING and FAILURE may be indistinguishable.

The range of operating system return codes is also restricted on some operating systems. This limits the portability of EXIT *n* and EXIT *variable* between platforms. For example, on UNIX there is only one byte of storage for return codes; therefore, the range for return codes is limited to zero to 255.

If you make a syntax error in the EXIT options or use a non-numeric variable, SQL*Plus performs an EXIT FAILURE COMMIT.

For information on exiting conditionally, see the [WHENEVER SQLERROR](#) command on page 12-187 and the [WHENEVER OSERROR](#) command on page 12-185.

Examples

The following example commits all uncommitted transactions and returns the error code of the last executed SQL command or PL/SQL block:

```
EXIT SQL.SQLCODE
```

GET

GET is not available in *iSQL*Plus*. In *iSQL*Plus* use Load Script.

Syntax

```
GET [FILE] file_name.[ext] [LIST | NOLIST]
```

Loads an operating system file into the SQL buffer.

In *iSQL*Plus* click the Load Script button to load a script into the Input area.

The buffer has no command history list and does not record *SQL*Plus* commands.

Terms

FILE

Keyword to specify that the following argument is the name of the script you want to load. This optional keyword is usually omitted.

If you want to load a script with the name file, because it is a command keyword, you need to put the name file in single quotes.

```
file_name.[ext]
```

Represents the file you wish to load (typically a script).

LIST

Lists the contents of the file after it is loaded. This is the default.

NOLIST

Suppresses the listing.

Usage

If you do not specify a file extension, *SQL*Plus* assumes the default command-file extension (normally SQL). For information on changing the default extension, see [SET SUF\[FIX\] \(SQL | text\)](#) on page 12-145.

If the filename you specify contains the word list or the word file, the name must be in double quotes. *SQL*Plus* searches for the file in the current working directory.

The operating system file should contain a single SQL statement or PL/SQL block. The statement should not be terminated with a semicolon. If a *SQL*Plus* command or more than one SQL statement or PL/SQL block is loaded into the SQL buffer from an operating system file, an error occurs when the RUN or slash (/) command is used to execute the buffer.

The GET command can be used to load files created with the SAVE command. See [SAVE](#) on page 12-88 for more information.

Examples

To load a file called YEARENDRPT with the extension SQL into the buffer, enter

```
GET YEARENDRPT
```

HELP

Syntax

```
HELP | ? [topic]
```

where *topic* represents a SQL*Plus help topic, for example, COLUMN.

Accesses the SQL*Plus command-line help system. Enter HELP INDEX or ? INDEX for a list of topics. You can view SQL*Plus resources at

http://www.oracle.com/technology/tech/sql_plus/ and the Oracle Database Library at <http://www.oracle.com/technology/documentation/>.

In iSQL*Plus, click the Help icon to access the iSQL*Plus Online Help.

Enter HELP or ? without *topic* to get help on the help system.

Usage

You can only enter one topic after HELP. You can abbreviate the topic (for example, COL for COLUMN). However, if you enter only an abbreviated topic and the abbreviation is ambiguous, SQL*Plus displays help for all topics that match the abbreviation. For example, if you enter

```
HELP EX
```

SQL*Plus displays the syntax for the EXECUTE command followed by the syntax for the EXIT command.

If you get a response indicating that help is not available, consult your database administrator.

Examples

To see a list of SQL*Plus commands for which help is available, enter

```
HELP INDEX
```

or

```
? INDEX
```

To see a single column list of SQL*Plus commands for which help is available, enter

```
HELP TOPICS
```

HOST

HOST is not available in *iSQL*Plus*.

Syntax

HO[ST] [*command*]

where *command* represents an operating system command.

Executes an operating system command without leaving SQL*Plus.

Enter HOST without *command* to display an operating system prompt. You can then enter multiple operating system commands. For information on returning to SQL*Plus, refer to the platform-specific Oracle documentation provided for your operating system.

Note: Operating system commands entered from a SQL*Plus session using the HOST command do not affect the current SQL*Plus session. For example, setting an operating system environment variable only affects SQL*Plus sessions started subsequently.

You can disable HOST. For more information about disabling HOST, see [SQL*Plus Security](#) on page 9-1.

Usage

In some operating systems, you can use a character in place of HOST such as "\$" in Windows or "!" in UNIX, or you may not have access to the HOST command. See the platform-specific Oracle documentation provided for your operating system or ask your DBA for more information.

On some platforms, an `_RC` substitution variable may be created with a HOST return value that is operation system dependent. It is recommended that you do not use the `_RC` substitution variable in scripts as it is not portable.

SQL*Plus removes the SQLTERMINATOR (a semicolon by default) before the HOST command is issued. A workaround for this is to add another SQLTERMINATOR. See [SET SQLT\[ERMINATOR\] {; | c | ON | OFF}](#) on page 12-144 for more information.

Examples

To execute a UNIX operating system command, `ls *.sql`, enter

```
HOST ls *.sql
```

To execute a Windows operating system command, `dir *.sql`, enter

```
HOST dir *.sql
```

INPUT

INPUT is not available in *iSQL*Plus*.

Syntax

```
INPUT [text]
```

where *text* represents the text you wish to add.

Adds one or more new lines of text after the current line in the buffer. The buffer has no command history list and does not record *SQL*Plus* commands.

To add a single line, enter the text of the line after the command INPUT, separating the text from the command with a space. To begin the line with one or more spaces, enter two or more spaces between INPUT and the first non-blank character of text.

To add several lines, enter INPUT with no text. INPUT prompts you for each line. To leave INPUT, enter a null (empty) line or a period.

Usage

If you enter a line number at the command prompt larger than the number of lines in the buffer, and follow the number with text, *SQL*Plus* adds the text in a new line at the end of the buffer. If you specify zero (0) for the line number and follow the zero with text, then *SQL*Plus* inserts the line at the beginning of the buffer (that line becomes line 1).

Examples

Assume the *SQL* buffer contains the following command:

```
SELECT LAST_NAME, DEPARTMENT_ID, SALARY, COMMISSION_PCT
FROM EMP_DETAILS_VIEW
```

To add an *ORDER BY* clause to the query, enter

```
LIST 2
```

```
2* FROM EMP_DETAILS_VIEW
```

```
INPUT ORDER BY LAST_NAME
```

LIST 2 ensures that line 2 is the current line. INPUT adds a new line containing the *ORDER BY* clause after the current line. The *SQL* buffer now contains the following lines:

```
1 SELECT LAST_NAME, DEPARTMENT_ID, SALARY, COMMISSION_PCT
2 FROM EMP_DETAILS_VIEW
3* ORDER BY LAST_NAME
```

To add a two-line *WHERE* clause, enter

```
LIST 2
```

```
2* FROM EMP_DETAILS_VIEW
```

```
INPUT
3  WHERE JOB_ID = 'SA_MAN'
4  AND COMMISSION_PCT=.25
5
```

INPUT prompts you for new lines until you enter an empty line or a period. The SQL buffer now contains the following lines:

```
SELECT LAST_NAME, DEPARTMENT_ID, SALARY, COMMISSION_PCT
FROM EMP_DETAILS_VIEW
WHERE JOB_ID = 'SA_MAN'
AND COMMISSION_PCT = .25
ORDER BY LAST_NAME
```

LIST

Syntax

```
L[IST] [n | n m | n* | n LAST | * | * n | * LAST | LAST]
```

Lists one or more lines of the SQL buffer.

The buffer has no command history list and does not record SQL*Plus commands. In SQL*Plus command-line you can also use ";" to list all the lines in the SQL buffer.

Terms

Term	Description
<i>n</i>	Lists line <i>n</i> .
<i>n m</i>	Lists lines <i>n</i> through <i>m</i> .
<i>n*</i>	Lists line <i>n</i> through the current line.
<i>n LAST</i>	Lists line <i>n</i> through the last line.
*	Lists the current line.
* <i>n</i>	Lists the current line through line <i>n</i> .
* LAST	Lists the current line through the last line.
LAST	Lists the last line.

Enter LIST with no clauses, or ";" to list all lines. The last line listed becomes the new current line (marked by an asterisk).

Examples

To list the contents of the buffer, enter

```
LIST
```

or enter

```
;
```

```
1 SELECT LAST_NAME, DEPARTMENT_ID, JOB_ID
2 FROM EMP_DETAILS_VIEW
3 WHERE JOB_ID = 'SH_CLERK'
4* ORDER BY DEPARTMENT_ID
```

The asterisk indicates that line 4 is the current line.

To list the second line only, enter

```
LIST 2
```

The second line is displayed:

```
2* FROM EMP_DETAILS_VIEW
```

To list from the current line (now line 2) to the last line, enter

```
LIST * LAST
```

You will then see this:

```
2 FROM EMP_DETAILS_VIEW
3 WHERE JOB_ID = 'SH_CLERK'
4* ORDER BY DEPARTMENT_ID
```

PASSWORD

Syntax

```
PASSW[ORD] [username]
```

where *username* specifies the user. If omitted, *username* defaults to the current user.

Enables you to change a password without echoing it on an input device. In *iSQL*Plus*, use the Password screen to change your password.

Usage

To change the password of another user, you must have been granted the appropriate privilege. See [CONNECT](#) on page 12-41 for more information about changing your password.

Examples

If you want to change your current password, enter

```
PASSWORD
Changing password for your_password
Old password: your_password
New password: new_password
Retype new password: new_password
Password changed
```

If you are logged on as a DBA, and want to change the password for user johnw (currently identified by johnwpass) to johnwnewpass

```
PASSWORD johnw
Changing password for johnw
New password: johnwnewpass
Retype new password: johnwnewpass
Password changed
```

Passwords are not echoed to the screen, they are shown here for your convenience.

PAUSE

Syntax

```
PAU[SE] [text]
```

where *text* represents the text you wish to display.

Displays the specified text then waits for the user to press RETURN.

In *iSQL*Plus*, displays the Next Page button which the user must click to continue.

Enter PAUSE followed by no text to display two empty lines.

Usage

Because PAUSE always waits for the user's response, it is best to use a message that tells the user explicitly to press [Return].

PAUSE reads input from the terminal (if a terminal is available) even when you have designated the source of the command input as a file.

See [SET PAU\[SE\] {ON | OFF | text}](#) on page 12-129 for information on pausing between pages of a report.

Examples

To print "Adjust paper and press RETURN to continue." and to have *SQL*Plus* wait for the user to press [Return], you might include the following PAUSE command in a script:

```
SET PAUSE OFF
PAUSE Adjust paper and press RETURN to continue.
SELECT ...
```

PRINT

Syntax

```
PR[INT] [variable ...]
```

where *variable ...* represents names of bind variables whose values you want to display.

Displays the current values of bind variables. For more information on bind variables, see your *Oracle Database PL/SQL User's Guide and Reference*.

Enter PRINT with no variables to print all bind variables.

Usage

Bind variables are created using the VARIABLE command. See [VARIABLE](#) on page 12-178 for more information and examples.

You can control the formatting of the PRINT output just as you would query output. For more information, see the formatting techniques described in [Formatting SQL*Plus Reports](#) on page 6-1.

To automatically display bind variables referenced in a successful PL/SQL block or used in an EXECUTE command, use the AUTOPRINT clause of the SET command. See [SET](#) on page 12-89 for more information.

Examples

The following example illustrates a PRINT command:

```
VARIABLE n NUMBER
BEGIN
:n := 1;
END;
/
```

```
PL/SQL procedure successfully completed.
```

```
PRINT n
```

```
N
-----
1
```

PROMPT

Syntax

```
PRO[MPT] [text]
```

where *text* represents the text of the message you want to display.

Sends the specified message or a blank line to the user's screen. If you omit *text*, PROMPT displays a blank line on the user's screen.

Usage

You can use this command in scripts to give information to the user.

Examples

The following example shows the use of PROMPT in conjunction with ACCEPT in a script called ASKFORDEPT.SQL. ASKFORDEPT.SQL contains the following SQL*Plus and SQL commands:

```
PROMPT
PROMPT Please enter a valid department
PROMPT For example: 10
SELECT DEPARTMENT_NAME FROM EMP_DETAILS_VIEW
WHERE DEPARTMENT_ID = &NEWDEPT
```

Assume you run the file using START or @:

```
@ASKFORDEPT.SQL VAL1
@HTTP://machine_name.domain:port/ASKFORDEPT.SQL VAL1
```

```
Please enter a valid department
For example: 10
Department ID?>
```

You can enter a department number at the prompt Department ID?>. By default, SQL*Plus lists the line containing &NEWDEPT before and after substitution, and then displays the department name corresponding to the number entered at the Department ID?> prompt. You can use SET VERIFY OFF to prevent this behavior.

RECOVER

Syntax

RECOVER {*general* | *managed* | BEGIN BACKUP | END BACKUP}

where the *general* clause has the following syntax:

```
[AUTOMATIC] [FROM location]
{ {full_database_recovery | partial_database_recovery | LOGFILE filename}
[ {TEST | ALLOW integer CORRUPTION | parallel_clause} [TEST | ALLOW integer CORRUPTION |
parallel_clause ]...}
| CONTINUE [DEFAULT] | CANCEL}
```

where the *full_database_recovery* clause has the following syntax:

```
[STANDBY] DATABASE
[ {UNTIL {CANCEL | TIME date | CHANGE integer} | USING BACKUP CONTROLFILE}
[UNTIL {CANCEL | TIME date | CHANGE integer} | USING BACKUP CONTROLFILE]...]
```

where the *partial_database_recovery* clause has the following syntax:

```
{TABLESPACE tablespace [, tablespace]...
| DATAFILE {filename | filename | filename | filename} [, filename | filename]...
| STANDBY {TABLESPACE tablespace [, tablespace]...
| DATAFILE {filename | filename} [, filename | filename]...}
UNTIL [CONSISTENT WITH] CONTROLFILE }
```

where the *parallel* clause has the following syntax:

```
{ NOPARALLEL | PARALLEL [ integer ] }
```

where the *managed* clause has the following syntax:

```
MANAGED STANDBY DATABASE recover_clause | cancel_clause | finish_clause
```

where the *recover_clause* has the following syntax:

```
{ { DISCONNECT [ FROM SESSION ] | { TIMEOUT integer | NOTIMEOUT } }
| { NODELAY | DEFAULT DELAY | DELAY integer } | NEXT integer
| { EXPIRE integer | NO EXPIRE } | parallel_clause
| USING CURRENT LOGFILE | UNTIL CHANGE integer
| THROUGH { [ THREAD integer ] SEQUENCE integer
| ALL ARCHIVELOG | { ALL | LAST | NEXT } SWITCHOVER } }
[ DISCONNECT [ FROM SESSION ] | { TIMEOUT integer | NOTIMEOUT }
| { NODELAY | DEFAULT DELAY | DELAY integer } | NEXT integer
| { EXPIRE integer | NO EXPIRE } | parallel_clause
| USING CURRENT LOGFILE | UNTIL CHANGE integer
| THROUGH { [ THREAD integer ] SEQUENCE integer
| ALL ARCHIVELOG | { ALL | LAST | NEXT } SWITCHOVER } ] ...
```

where the *cancel_clause* has the following syntax:

```
CANCEL [IMMEDIATE] [WAIT | NOWAIT]
```

where the *finish_clause* has the following syntax:

```
[ DISCONNECT [ FROM SESSION ] ] [ parallel_clause ]
FINISH [ SKIP [ STANDBY LOGFILE ] ] [ WAIT | NOWAIT ]
```

where the *parallel_clause* has the following syntax:

```
{ NOPARALLEL | PARALLEL [ integer ] }
```

Performs media recovery on one or more tablespaces, one or more datafiles, or the entire database. For more information on the RECOVER command, see the *Oracle Database Administrator's Guide*, the ALTER DATABASE RECOVER command in the *Oracle Database SQL Reference*, and the *Oracle Database Backup and Recovery Basics* guide.

You must set AUTORECOVERY to ON to use the RECOVER command in *iSQL*Plus*.

Because of possible network timeouts, it is recommended that you use SQL*Plus command-line, not *iSQL*Plus*, for long running DBA operations such as RECOVER.

Terms

AUTOMATIC

Automatically generates the name of the next archived redo log file needed to continue the recovery operation. Oracle Database uses the LOG_ARCHIVE_DEST (or LOG_ARCHIVE_DEST_1) and LOG_ARCHIVE_FORMAT parameters (or their defaults) to generate the target redo log filename. If the file is found, the redo contained in that file is applied. If the file is not found, SQL*Plus prompts you for a filename, displaying a generated filename as a suggestion.

If you do not specify either AUTOMATIC or LOGFILE, SQL*Plus prompts you for a filename, suggesting the generated filename. You can either accept the generated filename or replace it with a fully qualified filename. You can save time by using the LOGFILE clause to specify the filename if you know the archived filename differs from the filename Oracle Database would generate.

FROM *location*

Specifies the location from which the archived redo log file group is read. The value of *location* must be a fully specified file location. If you omit this parameter, SQL*Plus assumes the archived redo log file group is in the location specified by the initialization parameter LOG_ARCHIVE_DEST or LOG_ARCHIVE_DEST_1. Do not specify FROM if you have set a file with SET LOGSOURCE.

full_database_recovery

Enables you to specify the recovery of a full database.

partial_database_recovery

Enables you to specify the recovery of individual tablespaces and datafiles.

LOGFILE

Continues media recovery by applying the specified redo log file. In interactive recovery mode (AUTORECOVERY OFF), if a bad log name is entered, errors for the bad log name are displayed and you are prompted to enter a new log name.

TEST

Specifies a trial recovery to detect possible problems. Redo is applied normally, but no changes are written to disk, and changes are rolled back at the end of the trial recovery. You can only use the TEST clause for a trial recovery if you have restored a backup. In the event of logfile corruption, specifies the number of corrupt blocks that can be tolerated while allowing recovery to proceed. During normal recovery, *integer* cannot exceed 1.

ALLOW *integer* CORRUPTION

In the event of logfile corruption, specifies the number of corrupt blocks that can be tolerated while allowing recovery to proceed. During normal recovery, *integer* cannot exceed 1.

parallel_clause

Enables you to specify the degree of parallel processing to use during the recovery operation.

CONTINUE

Continues multi-instance recovery after it has been interrupted to disable a thread.

CONTINUE DEFAULT

Continues recovery using the redo log file generated automatically by Oracle Database if no other logfile is specified. This is equivalent to specifying **AUTOMATIC**, except that Oracle Database does not prompt for a filename.

CANCEL

Terminates cancel-based recovery.

STANDBY DATABASE

Recovers the standby database using the control file and archived redo log files copied from the primary database. The standby database must be mounted but not open.

DATABASE

Recovers the entire database.

UNTIL CANCEL

Specifies an incomplete, cancel-based recovery. Recovery proceeds by prompting you with suggested filenames of archived redo log files, and recovery completes when you specify **CANCEL** instead of a filename.

UNTIL TIME

Specifies an incomplete, time-based recovery. Use single quotes, and the following format:

```
'YYYY-MM-DD:HH24:MI:SS'
```

UNTIL CHANGE

Specifies an incomplete, change-based recovery. *integer* is the number of the System Change Number (SCN) following the last change you wish to recover. For example, if you want to restore your database up to the transaction with an SCN of 9, you would specify **UNTIL CHANGE 10**.

USING BACKUP CONTROLFILE

Specifies that a backup of the control file be used instead of the current control file.

TABLESPACE

Recovers a particular tablespace. *tablespace* is the name of a tablespace in the current database. You may recover up to 16 tablespaces in one statement.

DATAFILE

Recovers a particular datafile. You can specify any number of datafiles.

STANDBY TABLESPACE

Reconstructs a lost or damaged tablespace in the standby database using archived redo log files copied from the primary database and a control file.

STANDBY DATAFILE

Reconstructs a lost or damaged datafile in the standby database using archived redo log files copied from the primary database and a control file.

UNTIL CONSISTENT WITH CONTROLFILE

Specifies that the recovery of an old standby datafile or tablespace uses the current standby database control file.

PARALLEL [*integer*]

SQL*Plus selects a degree of parallelism equal to the number of CPUs available on all participating instances times the value of the PARALLEL_THREADS_PER_CPU initialization parameter.

The PARALLEL keyword overrides the RECOVERY_PARALLELISM initialization parameter. For more information about the PARALLEL keyword see the *Oracle Real Application Clusters Quick Start* guide.

Use *integer* to specify the degree of parallelism, which is the number of parallel threads used in the parallel operation. Each parallel thread may use one or two parallel execution processes.

NOPARALLEL

Specifies serial recovery processing. This is the default.

MANAGED STANDBY DATABASE

Specifies sustained standby recovery mode. This mode assumes that the standby database is an active component of an overall standby database architecture. A primary database actively archives its redo log files to the standby site. As these archived redo logs arrive at the standby site, they become available for use by a managed standby recovery operation. Sustained standby recovery is restricted to media recovery.

For more information on the parameters of this clause, see the *Oracle Database Backup and Recovery Advanced User's Guide*.

DISCONNECT

Indicates that the managed redo process (MRP) should apply archived redo files as a detached background process. Doing so leaves the current session available.

TIMEOUT

Specifies in minutes the wait period of the sustained recovery operation. The recovery process waits for *integer* minutes for a requested archived log redo to be available for writing to the standby database. If the redo log file does not become available within that time, the recovery process terminates with an error message. You can then issue the statement again to return to sustained standby recovery mode.

If you do not specify this clause, or if you specify NOTIMEOUT, the database remains in sustained standby recovery mode until you reissue the statement with the RECOVER CANCEL clause or until instance shutdown or failure.

NODELAY

Applies a delayed archive log immediately to the standby database overriding any DELAY setting in the LOG_ARCHIVE_DEST_n parameter on the primary database. If you omit this clause, application of the archive log is delayed according to the parameter setting. If DELAY was not specified in the parameter, the archive log is applied immediately.

DEFAULT DELAY

Waits the default number of minutes specified in the LOG_ARCHIVE_DEST_n initialization parameter before applying the archived redo logs.

DELAY *integer*

Waits *integer* minutes before applying the archived redo logs.

NEXT *integer*

Applies the specified number of archived redo logs as soon as possible after they have been archived. It temporarily overrides any DELAY setting in the LOG_ARCHIVE_DEST_n parameter on the primary database, and any delay values set in an earlier SQL*Plus RECOVER command or an ALTER DATABASE RECOVER command.

EXPIRE *integer*

Specifies the number of minutes from the current time after which managed recovery terminates automatically.

NO EXPIRE

Disables a previously specified EXPIRE *integer* option.

USING CURRENT LOGFILE

Recovers redo from standby online logs as they are being filled, without requiring them to be archived in the standby database first.

UNTIL CHANGE *integer*

Processes managed recovery up to but not including the specified system change number (SCN).

THROUGH THREAD *integer* SEQUENCE *integer*

Terminates managed recovery based on archive log thread number and sequence number. Managed recovery terminates when the corresponding archive log has been applied. If omitted, THREAD defaults to 1.

THROUGH ALL ARCHIVELOG

Continues managed standby until all archive logs have been recovered. You can use this statement to override a THROUGH THREAD *integer* SEQUENCE *integer* clause issued in an earlier statement. If the THROUGH clause is omitted, this is the default.

THROUGH ALL SWITCHOVER

Keeps managed standby recovery running through all switchover operations.

THROUGH LAST SWITCHOVER

Terminates managed standby recovery after the final end-of-redo archival indicator.

THROUGH NEXT SWITCHOVER

Terminates managed standby recovery after recovering the next end-of-redo archival indicator.

CANCEL (*managed clause*)

Terminates managed standby recovery after applying the current archived redo file. Session control returns when the recovery process terminates.

CANCEL IMMEDIATE

Terminates managed standby recovery after applying the current archived redo file, or after the next redo log file read, whichever comes first. Session control returns when the recovery process terminates.

CANCEL IMMEDIATE WAIT

Terminates managed standby recovery after applying the current archived redo file or after the next redo log file read, whichever comes first. Session control returns when the managed standby recovery terminates.

CANCEL IMMEDIATE cannot be issued from the same session that issued the RECOVER MANAGED STANDBY DATABASE statement.

CANCEL IMMEDIATE NOWAIT

Terminates managed standby recovery after applying the current archived redo file, or after the next redo log file read, whichever comes first. Session control returns immediately.

CANCEL NOWAIT

Terminates managed standby recovery after the next redo log file read and returns session control immediately.

FINISH

Recovers the current standby online logfiles of the standby database. This clause may be useful if the primary database fails. It overrides any delays specified for archivelogs, so that logs are applied immediately.

FINISH cannot be issued if you have also specified TIMEOUT, DELAY, EXPIRE or NEXT clauses.

Usage

You must have the OSDBA role enabled. You cannot use the RECOVER command when connected through the multi-threaded server.

To perform media recovery on an entire database (all tablespaces), the database must be mounted and closed, and all tablespaces requiring recovery must be online.

To perform media recovery on a tablespace, the database must be mounted or open, and the tablespace must be offline.

To perform media recovery on a datafile, the database can remain open and mounted with the damaged datafiles offline (unless the file is part of the SYSTEM tablespace).

Before using the RECOVER command you must have restored copies of the damaged datafiles from a previous backup. Be sure you can access all archived and online redo log files dating back to when that backup was made.

When another log file is required during recovery, a prompt suggests the names of files that are needed. The name is derived from the values specified in the initialization parameters LOG_ARCHIVE_DEST and LOG_ARCHIVE_FORMAT. You should restore copies of the archived redo log files needed for recovery to the destination specified in LOG_ARCHIVE_DEST, if necessary. You can override the initialization parameters by setting the LOGSOURCE variable with the SET LOGSOURCE command.

During recovery you can accept the suggested log name by pressing return, cancel recovery by entering CANCEL instead of a log name, or enter AUTO at the prompt for automatic file selection without further prompting.

If you have enabled autorecovery (that is, SET AUTORECOVERY ON), recovery proceeds without prompting you with filenames. Status messages are displayed when each log file is applied. When normal media recovery is done, a completion status is returned.

Examples

To recover the entire database, enter

```
RECOVER DATABASE
```

To recover the database until a specified time, enter

```
RECOVER DATABASE UNTIL TIME 01-JAN-2001:04:32:00
```

To recover the two tablespaces ts_one and ts_two from the database, enter

```
RECOVER TABLESPACE ts_one, ts_two
```

To recover the datafile data1.db from the database, enter

```
RECOVER DATAFILE 'data1.db'
```

REMARK

Syntax

```
REM[ARK]
```

Begins a comment in a script. SQL*Plus does not interpret the comment as a command.

Usage

The REMARK command must appear at the beginning of a line, and the comment ends at the end of the line. A line cannot contain both a comment and a command.

A "-" at the end of a REMARK line is treated as a line continuation character.

For details on entering comments in scripts using the SQL comment delimiters, /* ... */ , or the ANSI/ISO comment delimiter, --, see [Placing Comments in Scripts](#) on page 5-7.

Examples

The following script contains some typical comments:

```
REM COMPUTE uses BREAK ON REPORT to break on end of table
BREAK ON REPORT
COMPUTE SUM OF "DEPARTMENT 10" "DEPARTMENT 20" -
"DEPARTMENT 30" "TOTAL BY JOB_ID" ON REPORT
REM Each column displays the sums of salaries by job for
REM one of the departments 10, 20, 30.
SELECT JOB_ID,
SUM(DECODE( DEPARTMENT_ID, 10, SALARY, 0)) "DEPARTMENT 10",
SUM(DECODE( DEPARTMENT_ID, 20, SALARY, 0)) "DEPARTMENT 20",
SUM(DECODE( DEPARTMENT_ID, 30, SALARY, 0)) "DEPARTMENT 30",
SUM(SALARY) "TOTAL BY JOB_ID"
FROM EMP_DETAILS_VIEW
GROUP BY JOB_ID;
```

REPFOOTER

Syntax

```
REPFOOTER [PAGE] [printspec [text | variable] ...] | [ON | OFF]
```

where *printspec* represents one or more of the following clauses used to place and format the text:

```
COL n  
S[KIP] [n]  
TAB n  
LE[FT]  
CE[NTER]  
R[IGHT]  
BOLD  
FORMAT text
```

Places and formats a specified report footer at the bottom of each report, or lists the current REPFOOTER definition.

Enter REPFOOTER with no clauses to list the current REPFOOTER definition.

Terms

See the [REPHEADER](#) command on page 12-84 for additional information on terms and clauses in the REPFOOTER command syntax.

Usage

If you do not enter a *printspec* clause before the text or variables, REPFOOTER left justifies the text or variables.

You can use any number of constants and variables in a *printspec*. SQL*Plus displays the constants and variables in the order you specify them, positioning and formatting each constant or variable as specified by the *printspec* clauses that precede it.

Note: If SET EMBEDDED is ON, the report footer is suppressed.

Examples

To define "END EMPLOYEE LISTING REPORT" as a report footer on a separate page and to center it, enter:

```
REPFOOTER PAGE CENTER 'END EMPLOYEE LISTING REPORT'  
TTITLE RIGHT 'Page: ' FORMAT 999 SQL.PNO  
SELECT LAST_NAME, SALARY  
FROM EMP_DETAILS_VIEW  
WHERE SALARY > 12000;
```

LAST_NAME	SALARY
King	24000
Kochhar	17000
De Haan	17000
Russell	14000
Partners	13500
Hartstein	13000
sum	98500

Page: 2

END EMPLOYEE LISTING REPORT

6 rows selected.

To suppress the report footer without changing its definition, enter

REPFooter OFF

REPHEADER

Syntax

REP[HEADER] [PAGE] [*printspec* [*text* | *variable*] ...] | [ON | OFF]

where *printspec* represents one or more of the following clauses used to place and format the text:

COL *n*
S[KIP] [*n*]
TAB *n*
LE[FT]
CE[NTER]
R[IGHT]
BOLD
FORMAT *text*

Places and formats a specified report header at the top of each report, or lists the current REPHEADER definition.

Enter REPHEADER with no clauses to list the current REPHEADER definition.

Terms

These terms and clauses also apply to the REPFOOTER command.

PAGE

Begins a new page after printing the specified report header or before printing the specified report footer.

text

The report header or footer text. Enter *text* in single quotes if you want to place more than one word on a single line. The default is NULL.

variable

A substitution variable or any of the following system-maintained values. SQL.LNO is the current line number, SQL.PNO is the current page number, SQL.CODE is the current error code, SQL.RELEASE is the current Oracle Database release number, and SQL.USER is the current username.

To print one of these values, reference the appropriate variable in the report header or footer. You can use the FORMAT clause to format *variable*.

OFF

Turns the report header or footer off (suppresses its display) without affecting its definition.

COL *n*

Indents to column *n* of the current line (backward if column *n* has been passed). Column in this context means print position, not table column.

S[KIP] [*n*]

Skips to the start of a new line *n* times; if you omit *n*, one time; if you enter zero for *n*, backward to the start of the current line.

TAB *n*

Skips forward *n* columns (backward if you enter a negative value for *n*). Column in this context means print position, not table column.

LE[FT] CE[NTER] R[IGHT]

Left-align, center, and right-align data on the current line respectively. SQL*Plus aligns following data items as a group, up to the end of the *printspec* or the next LEFT, CENTER, RIGHT, or COL command. CENTER and RIGHT use the SET LINESIZE value to calculate the position of the data item that follows.

BOLD

Prints data in bold print. SQL*Plus represents bold print on your terminal by repeating the data on three consecutive lines. On some operating systems, SQL*Plus may instruct your printer to print bold text on three consecutive lines, instead of bold.

FORMAT *text*

Specifies a format model that determines the format of data items up to the next FORMAT clause or the end of the command. The format model must be a text constant such as A10 or \$999. See [COLUMN](#) on page 12-28 for more information on formatting and valid format models.

If the datatype of the format model does not match the datatype of a given data item, the FORMAT clause has no effect on that item.

If no appropriate FORMAT model precedes a given data item, SQL*Plus prints NUMBER values according to the format specified by SET NUMFORMAT or, if you have not used SET NUMFORMAT, the default format. SQL*Plus prints DATE values using the default format.

Usage

If you do not enter a *printspec* clause before the text or variables, REPHEADER left justifies the text or variables.

You can use any number of constants and variables in a *printspec*. SQL*Plus displays the constants and variables in the order you specify, positioning and formatting each constant or variable as specified by the *printspec* clauses that precede it.

Examples

To define "EMPLOYEE LISTING REPORT" as a report header on a separate page, and to center it, enter:

```
REPHEADER PAGE CENTER 'EMPLOYEE LISTING REPORT'
TTITLE RIGHT 'Page: ' FORMAT 999 SQL.PNO
SELECT LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE SALARY > 12000;
```

EMPLOYEE LISTING REPORT		Page: 1
LAST_NAME	SALARY	Page: 2
-----	-----	
King	24000	
Kochhar	17000	
De Haan	17000	
Russell	14000	
Partners	13500	
Hartstein	13000	

sum	98500	
6 rows selected.		

To suppress the report header without changing its definition, enter:

```
REPHEADER OFF
```

RUN

Syntax

R[UN]

Lists and executes the SQL command or PL/SQL block currently stored in the SQL buffer.

The buffer has no command history list and does not record SQL*Plus commands.

Usage

RUN causes the last line of the SQL buffer to become the current line.

The slash command (/) functions similarly to RUN, but does not list the command in the SQL buffer on your screen. The SQL buffer always contains the last SQL statement or PL/SQL block entered.

Examples

Assume the SQL buffer contains the following script:

```
SELECT DEPARTMENT_ID
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000
To RUN the script, enter
```

```
RUN
```

```
1  SELECT DEPARTMENT_ID
2  FROM EMP_DETAILS_VIEW
3  WHERE SALARY>12000

DEPARTMENT_ID
-----
              90
              90
              90
              80
              80
              20

6 rows selected.
```

SAVE

SAVE is not available in *iSQL*Plus*. In *iSQL*Plus* use Save Script.

Syntax

```
SAV[E] [FILE] file_name[.ext] [CRE[ATE] | REP[LACE] | APP[END]]
```

Saves the contents of the SQL buffer in an operating system script. In *iSQL*Plus*, click the Save Script button to save the Input area contents to a script.

The buffer has no command history list and does not record *SQL*Plus* commands.

Terms

FILE

Keyword to specify that the following argument is the name you want to give to the saved script. This optional keyword is usually omitted.

If you want to save the script with the name `file`, because it is a command keyword, you need to put the name `file` in single quotes.

```
file_name[.ext]
```

Specifies the script in which you wish to save the buffer's contents.

CREATE

Creates a new file with the name specified. This is the default behavior.

REP[LACE]

Replaces the contents of an existing file. If the file does not exist, `REPLACE` creates the file.

APP[END]

Adds the contents of the buffer to the end of the file you specify.

Usage

If you do not specify an extension, *SQL*Plus* assumes the default command-file extension (normally `SQL`). See [SET SUF\[`FIX`\] \(`SQL` | `text`\)](#) on page 12-145 for information on changing this default extension.

If you wish to `SAVE` a file under a name identical to a `SAVE` command clause (`CREATE`, `REPLACE`, or `APPEND`), you must specify a file extension.

When you `SAVE` the contents of the SQL buffer, `SAVE` adds a line containing a slash (`/`) to the end of the file.

Examples

To save the contents of the buffer in a file named `DEPTSALRPT` with the extension `SQL`, enter

```
SAVE DEPTSALRPT
```

To save the contents of the buffer in a file named `DEPTSALRPT` with the extension `OLD`, enter

```
SAVE DEPTSALRPT.OLD
```

SET

Sets a system variable to alter the SQL*Plus environment settings for your current session, for example, to:

- customize HTML formatting
- enable or disable the printing of column headings
- set the number of lines per page
- set the display width for data

You also use the Preferences screens in *iSQL*Plus* to set system variables.

Syntax

SET *system_variable value*

where *system_variable* and *value* represent one of the clauses shown in the [SET System Variable Summary](#) on page 12-90 table following.

Usage

SQL*Plus maintains system variables (also called SET command variables) to enable you to set up a particular environment for a SQL*Plus session. You can change these system variables with the SET command and list them with the SHOW command.

SET ROLE and SET TRANSACTION are SQL commands (see the *Oracle Database SQL Reference* for more information). When not followed by the keywords TRANSACTION or ROLE, SET is assumed to be a SQL*Plus command.

SET System Variable Summary

System Variable	Page	Description
SET APPINFO{ON <u>OFF</u> <i>text</i> }	on page 12-93	Sets automatic registering of scripts through the DBMS_APPLICATION_INFO package.
SET ARRAYSIZE { <u>15</u> <i>n</i> }	on page 12-94	Sets the number of rows, called a <i>batch</i> , that SQL*Plus will fetch from the database at one time.
SET AUTOCOMMIT{ON <u>OFF</u> IMMEDIATE <i>n</i> }	on page 12-95	Controls when Oracle Database commits pending changes to the database.
SET AUTOPRINT {ON <u>OFF</u> }	on page 12-96	Sets the automatic printing of bind variables.
SET AUTORECOVERY [ON <u>OFF</u>]	on page 12-97	ON sets the RECOVER command to automatically apply the default filenames of archived redo log files needed during recovery.
SET AUTOTRACE {ON <u>OFF</u> TRACE[ONLY]} [EXPLAIN] [STATISTICS]	on page 12-98	Displays a report on the execution of successful SQL DML statements (SELECT, INSERT, UPDATE or DELETE).
SET BLOCKTERMINATOR { <i>.</i> <i>c</i> <u>ON</u> OFF}	on page 12-99	Sets the non-alphanumeric character used to end PL/SQL blocks to <i>c</i> .
SET CMDSEP { <i>;</i> <i>c</i> ON <u>OFF</u> }	on page 12-100	Sets the non-alphanumeric character used to separate multiple SQL*Plus commands entered on one line to <i>c</i> .
SET COLSEP { <i>_</i> <i>text</i> }	on page 12-101	In <i>iSQL*Plus</i> , SET COLSEP determines the column separator character to be printed between column output that is rendered inside <PRE> tags. Sets the text to be printed between selected columns.
SET CONCAT [<i>.</i> <i>c</i> <u>ON</u> OFF]	on page 12-102	Sets the character you can use to terminate a substitution variable reference if you wish to immediately follow the variable with a character that SQL*Plus would otherwise interpret as a part of the substitution variable name.
SET COPYCOMMIT { <u>0</u> <i>n</i> }	on page 12-103	Controls the number of batches after which the COPY command commits changes to the database.
SET COPYTYPECHECK { <u>ON</u> OFF}	on page 12-104	Sets the suppression of the comparison of datatypes while inserting or appending to tables with the COPY command.
SET DEFINE {& <i>c</i> <u>ON</u> OFF}	on page 12-105	Sets the character used to prefix variables to <i>c</i> .
SET DESCRIBE [DEPTH { <u>1</u> <i>n</i> ALL}] [LINENUM {ON <u>OFF</u> }] [INDENT {ON <u>OFF</u> }]	on page 12-106	Sets the depth of the level to which you can recursively describe an object.
SET ECHO {ON <u>OFF</u> }	on page 12-107	Controls whether the START command lists each command in a script as the command is executed.
*SET EDITFILE <i>file_name</i> [<i>.ext</i>]	on page 12-108	Sets the default filename for the EDIT command.
SET EMBEDDED {ON <u>OFF</u> }	on page 12-109	Controls where on a page each report begins.
SET ESCAPE { <i>\</i> <i>c</i> ON <u>OFF</u> }	on page 12-110	Defines the character you enter as the escape character.
SET FEEDBACK { <u>6</u> <i>n</i> <u>ON</u> OFF}	on page 12-111	Displays the number of records returned by a query when a query selects at least <i>n</i> records.
SET FLAGGER { <u>OFF</u> ENTRY INTERMEDIATE FULL}	on page 12-112	Checks to make sure that SQL statements conform to the ANSI/ISO SQL92 standard.
*SET FLUSH { <u>ON</u> OFF}	on page 12-113	Controls when output is sent to the user's display device.
SET HEADING { <u>ON</u> OFF}	on page 12-114	Controls printing of column headings in reports.

System Variable	Page	Description
SET HEADSEP { <u>_</u> <i>c</i> <u>ON</u> OFF}	on page 12-115	Defines the character you enter as the heading separator character.
SET INSTANCE [<i>instance_path</i> LOCAL]	on page 12-116	Changes the default instance for your session to the specified instance path.
SET LINESIZE { <u>80</u> <i>n</i> }	on page 12-117	Sets the total number of characters that SQL*Plus displays on one line before beginning a new line.
SET LINESIZE { <u>150</u> <i>n</i> } in iSQL*Plus		
SET LOBOFFSET { <i>n</i> <u>1</u> }	on page 12-118	Sets the starting position from which CLOB and NCLOB data is retrieved and displayed.
SET LOGSOURCE [<i>pathname</i>]	on page 12-119	Specifies the location from which archive logs are retrieved during recovery.
SET LONG { <u>80</u> <i>n</i> }	on page 12-120	Sets maximum width (in bytes) for displaying LONG, CLOB, NCLOB and XMLType values; and for copying LONG values.
SET LONGCHUNKSIZE { <u>80</u> <i>n</i> }	on page 12-121	Sets the size (in bytes) of the increments in which SQL*Plus retrieves a LONG, CLOB, NCLOB or XMLType value.
SET MARKUP HTML [ON OFF] [HEAD <i>text</i>] [BODY <i>text</i>] [TABLE <i>text</i>] [ENTMAP {ON OFF}] [SPOOL {ON OFF}] [PREFORMAT {ON OFF}]	on page 12-122	Outputs HTML marked up text, which is the output used by iSQL*Plus.
SET NEWPAGE { <u>1</u> <i>n</i> NONE}	on page 12-124	Sets the number of blank lines to be printed from the top of each page to the top title.
SET NULL <i>text</i>	on page 12-125	Sets the text that represents a null value in the result of a SQL SELECT command.
SET NUMFORMAT <i>format</i>	on page 12-126	Sets the default format for displaying numbers.
SET NUMWIDTH { <u>10</u> <i>n</i> }	on page 12-127	Sets the default width for displaying numbers.
SET PAGESIZE { <u>14</u> <i>n</i> }	on page 12-128	Sets the number of lines in each page.
SET PAUSE {ON OFF <i>text</i> }	on page 12-129	Enables you to control scrolling of your terminal when running reports.
SET RECSEP {WRAPPED EACH OFF}	on page 12-130	RECSEP tells SQL*Plus where to make the record separation.
SET RECSEPCHAR { <u>_</u> <i>c</i> }	on page 12-131	Display or print record separators.
SET SERVEROUTPUT {ON OFF} [SIZE { <i>n</i> UNLIMITED}] [FORMAT {WRAPPED WORD_ WRAPPED TRUNCATED}]	on page 12-132	Controls whether to display the output (that is, DBMS_OUTPUT PUT_LINE) of stored procedures or PL/SQL blocks in SQL*Plus.
*SET SHIFTINOUT {VISIBLE INVISIBLE}	on page 12-134	Enables correct alignment for terminals that display shift characters.
*SET SHOWMODE {ON OFF}	on page 12-135	Controls whether SQL*Plus lists the old and new settings of a SQL*Plus system variable when you change the setting with SET.
*SET SQLBLANKLINES {ON OFF}	on page 12-136	Controls whether SQL*Plus puts blank lines within a SQL command or script.
SET SQLCASE {MIXED LOWER UPPER}	on page 12-137	Converts the case of SQL commands and PL/SQL blocks just prior to execution.
*SET SQLCONTINUE { <u>>=</u> <i>text</i> }	on page 12-138	Sets the character sequence SQL*Plus displays as a prompt after you continue a SQL*Plus command on an additional line using a hyphen (-).
*SET SQLNUMBER {ON OFF}	on page 12-139	Sets the prompt for the second and subsequent lines of a SQL command or PL/SQL block.
SET SQLPLUSCOMPATIBILITY { <i>x.y.z</i> }	on page 12-140	Sets the behavior or output format of VARIABLE to that of the release or version specified by <i>x y [z]</i> .

System Variable	Page	Description
*SET SQLPREFIX {# <i>c</i> }	on page 12-142	Sets the SQL*Plus prefix character.
*SET SQLPROMPT {SQL> <i>text</i> }	on page 12-143	Sets the SQL*Plus command prompt.
SET SQLTERMINATOR {; <i>c</i> <u>ON</u> OFF}	on page 12-144	Sets the character used to end and execute SQL commands to <i>c</i> .
*SET SUFFIX {SQL <i>text</i> }	on page 12-145	Sets the default file that SQL*Plus uses in commands that refer to scripts.
*SET TAB { <u>ON</u> OFF}	on page 12-146	Determines how SQL*Plus formats white space in terminal output.
*SET TERMOUT { <u>ON</u> OFF}	on page 12-147	Controls the display of output generated by commands executed from a script.
*SET TIME {ON <u>OFF</u> }	on page 12-148	Controls the display of the current time.
SET TIMING {ON <u>OFF</u> }	on page 12-149	Controls the display of timing statistics.
*SET TRIMOUT { <u>ON</u> OFF}	on page 12-150	Determines whether SQL*Plus puts trailing blanks at the end of each displayed line.
*SET TRIMSPOOL {ON <u>OFF</u> }	on page 12-151	Determines whether SQL*Plus puts trailing blanks at the end of each spooled line.
SET UNDERLINE {- <i>c</i> <u>ON</u> OFF}	on page 12-152	Sets the character used to underline column headings in SQL*Plus reports to <i>c</i> .
SET VERIFY { <u>ON</u> OFF}	on page 12-153	Controls whether SQL*Plus lists the text of a SQL statement or PL/SQL command before and after SQL*Plus replaces substitution variables with values.
SET WRAP { <u>ON</u> OFF}	on page 12-154	Controls whether SQL*Plus truncates the display of a SELECTed row if it is too long for the current line width.
SET XQUERY BASEURI { <i>text</i> }	on page 12-155	Defines the base URI to use. This is useful to change the prefix of the file to access when writing generic XQuery expressions.
SET XQUERY ORDERING {ORDERED UNORDERED <u>DEFAULT</u> }	on page 12-156	Controls the ordering of results from an XQuery.
SET XQUERY NODE {BYVALUE BYREFERENCE <u>DEFAULT</u> }	on page 12-157	Sets the preservation mode for notes created or returned.
SET XQUERY CONTEXT { <i>text</i> }	on page 12-158	Specifies an XQuery context item which can be either a node or a value.

An asterisk (*) indicates the SET option is not available in *iSQL*Plus*.

SET APPI[NFO]{ON | OFF | *text*}

Sets automatic registering of scripts through the DBMS_APPLICATION_INFO package.

This enables the performance and resource usage of each script to be monitored by your DBA. The registered name appears in the MODULE column of the V\$SESSION and V\$SQLAREA virtual tables. You can also read the registered name using the DBMS_APPLICATION_INFO.READ_MODULE procedure.

ON registers scripts invoked by the @, @@ or START commands. OFF disables registering of scripts. Instead, the current value of text is registered. *text* specifies the text to register when no script is being run or when APPINFO is OFF, which is the default. The default for *text* is "SQL*Plus". If you enter multiple words for *text*, you must enclose them in quotes. The maximum length for *text* is limited by the DBMS_APPLICATION_INFO package.

The registered name has the format *nn@xfilename* where: *nn* is the depth level of script; *x* is '<' when the script name is truncated, otherwise, it is blank; and *filename* is the script name, possibly truncated to the length allowed by the DBMS_APPLICATION_INFO package interface.

For more information on the DBMS_APPLICATION_INFO package, see the *Oracle Database Performance Tuning Guide*.

Example

To display the value of APPINFO, as it is SET OFF by default, enter

```
SET APPINFO ON
SHOW APPINFO
```

```
APPINFO is ON and set to "SQL*Plus"
```

To change the default text, enter

```
SET APPINFO 'This is SQL*Plus'
```

To make sure that registration has taken place, enter

```
VARIABLE MOD VARCHAR2(50)
VARIABLE ACT VARCHAR2(40)
EXECUTE DBMS_APPLICATION_INFO.READ_MODULE(:MOD, :ACT);
```

```
PL/SQL procedure successfully completed.
```

```
PRINT MOD
```

```
MOD
-----
This is SQL*Plus
```

To change APPINFO back to its default setting, enter

```
SET APPINFO OFF
```

SET ARRAY[SIZE] {15 | n}

Sets the number of rows that SQL*Plus will fetch from the database at one time.

Valid values are 1 to 5000. A large value increases the efficiency of queries and subqueries that fetch many rows, but requires more memory. Values over approximately 100 provide little added performance. ARRAYSIZE has no effect on the results of SQL*Plus operations other than increasing efficiency.

SET AUTO[COMMIT]{ON | OFF | IMM[EDIATE] | *n*}

Controls when Oracle Database commits pending changes to the database after SQL or PL/SQL commands.

ON commits pending changes to the database after Oracle Database executes each successful INSERT, UPDATE, or DELETE, or PL/SQL block. OFF suppresses automatic committing so that you must commit changes manually (for example, with the SQL command COMMIT). IMMEDIATE functions in the same manner as ON. *n* commits pending changes to the database after Oracle Database executes *n* successful SQL INSERT, UPDATE, or DELETE commands, or PL/SQL blocks. *n* cannot be less than zero or greater than 2,000,000,000. The statement counter is reset to zero after successful completion of *n* INSERT, UPDATE or DELETE commands or PL/SQL blocks, a commit, a rollback, or a SET AUTOCOMMIT command.

SET AUTOCOMMIT does not alter the commit behavior when SQL*Plus exits. Any uncommitted data is committed by default.

Note: For this feature, a PL/SQL block is considered one transaction, regardless of the actual number of SQL commands contained within it.

SET AUTOP[RINT] {ON | OFF}

Sets the automatic printing of bind variables.

ON or OFF controls whether SQL*Plus automatically displays bind variables (referenced in a successful PL/SQL block or used in an EXECUTE command).

See [PRINT](#) on page 12-72 for more information about displaying bind variables.

SET AUTORECOVERY [ON | OFF]

ON sets the RECOVER command to automatically apply the default filenames of archived redo log files needed during recovery.

No interaction is needed, provided the necessary files are in the expected locations with the expected names. The filenames used are derived from the values of the initialization parameters LOG_ARCHIVE_DEST and LOG_ARCHIVE_FORMAT.

OFF, the default option, requires that you enter the filenames manually or accept the suggested default filename given. See [RECOVER](#) on page 12-74 for more information about database recovery.

You must set AUTORECOVERY to ON to use the RECOVER command in *iSQL*Plus*.

Example

To set the recovery mode to AUTOMATIC, enter

```
SET AUTORECOVERY ON  
RECOVER DATABASE
```

SET AUTOT[RACE] {ON | OFF | TRACE[ONLY]} [EXP[LAIN]] [STAT[ISTICS]]

Displays a report on the execution of successful SQL DML statements (SELECT, INSERT, UPDATE or DELETE).

The report can include execution statistics and the query execution path.

OFF does not display a trace report. ON displays a trace report. TRACEONLY displays a trace report, but does not print query data, if any. EXPLAIN shows the query execution path by performing an EXPLAIN PLAN. STATISTICS displays SQL statement statistics. Information about EXPLAIN PLAN is documented in the *Oracle Database SQL Reference*.

Using ON or TRACEONLY with no explicit options defaults to EXPLAIN STATISTICS.

The TRACEONLY option may be useful to suppress the query data of large queries. If STATISTICS is specified, SQL*Plus still fetches the query data from the server, however, the data is not displayed.

The AUTOTRACE report is printed after the statement has successfully completed.

Information about Execution Plans and the statistics is documented in the *Oracle Database Performance Tuning Guide*.

When SQL*Plus produces a STATISTICS report, a second connection to the database is automatically created. This connection is closed when the STATISTICS option is set to OFF, or you log out of SQL*Plus.

The formatting of your AUTOTRACE report may vary depending on the version of the server to which you are connected and the configuration of the server. The additional information and tabular output of AUTOTRACE PLAN is supported when connecting to Oracle Database 10g (Release 10.1) or later. When you connect to an earlier database, the older form or AUTOTRACE reporting is used.

AUTOTRACE is not available when FIPS flagging is enabled.

AUTOTRACE PLAN does not use glogin.sql column definitions to display output.

See [Tracing Statements](#) on page 8-1 for more information on AUTOTRACE.

SET BLO[CKTERMINATOR] { . | *c* | ON | OFF }

Sets the character used to end PL/SQL blocks to *c*.

It cannot be an alphanumeric character or a whitespace. To execute the block, you must issue a RUN or / (slash) command.

OFF means that SQL*Plus recognizes no PL/SQL block terminator. ON changes the value of *c* back to the default period (.), not the most recently used character.

SET CMDS[EP] {; | c | ON | OFF}

Sets the non-alphanumeric character used to separate multiple SQL*Plus commands entered on one line to *c*.

ON or OFF controls whether you can enter multiple commands on a line. ON automatically sets the command separator character to a semicolon (;).

Example

To specify a title with TTITLE and format a column with COLUMN, both on the same line, enter

```
SET CMDSEP +
TTITLE LEFT 'SALARIES' + COLUMN SALARY FORMAT $99,999
SELECT LAST_NAME, SALARY FROM EMP_DETAILS_VIEW
WHERE JOB_ID = 'SH_CLERK';
```

SALARIES	
LAST_NAME	SALARY

Taylor	\$3,200
Fleaur	\$3,100
Sullivan	\$2,500
Geoni	\$2,800
Sarchand	\$4,200
Bull	\$4,100
Dellinger	\$3,400
Cabrio	\$3,000
Chung	\$3,800
Dilly	\$3,600
Gates	\$2,900
Perkins	\$2,500
Bell	\$4,000
Everett	\$3,900
McCain	\$3,200
Jones	\$2,800
SALARIES	
LAST_NAME	SALARY

Walsh	\$3,100
Feeney	\$3,000
OConnell	\$2,600
Grant	\$2,600

20 rows selected.

SET COLSEP { *| text* }

Sets the column separator character printed between columns in output.

If the COLSEP variable contains blanks or punctuation characters, you must enclose it with single quotes. The default value for *text* is a single space.

In multi-line rows, the column separator does not print between columns that begin on different lines. The column separator does not appear on blank lines produced by BREAK ... SKIP *n* and does not overwrite the record separator. See [SET RECSEP \[WR\[APPED\] | EA\[CH\] | OFF\]](#) on page 12-130 for more information.

The Column Separator (SET COLSEP) is only used in iSQL*Plus when Preformatted Output is ON (SET MARKUP HTML PREFORMAT).

Example

To set the column separator to "|" enter

```
SET MARKUP HTML PREFORMAT ON
SET COLSEP '|'
SELECT LAST_NAME, JOB_ID, DEPARTMENT_ID
FROM EMP_DETAILS_VIEW
WHERE DEPARTMENT_ID = 20;
```

LAST_NAME	JOB_ID	DEPARTMENT_ID
Hartstein	MK_MAN	20
Fay	MK_REP	20

SET CON[CAT] { . | c | ON | OFF }

Sets the character used to terminate a substitution variable reference when SQL*Plus would otherwise interpret the next character as a part of the variable name.

SQL*Plus resets the value of CONCAT to a period when you switch CONCAT on.

SET COPYC[OMMIT] {0 | *n*}

Controls the number of rows after which the COPY command commits changes to the database.

COPY commits rows to the destination database each time it copies *n* row batches. Valid values are zero to 5000. You can set the size of a batch with the ARRAYSIZE variable. If you set COPYCOMMIT to zero, COPY performs a commit only at the end of a copy operation.

SET COPYTYPECHECK {ON | OFF}

Sets the suppression of the comparison of datatypes while inserting or appending to tables with the COPY command.

This is to facilitate copying to DB2, which requires that a CHAR be copied to a DB2 DATE.

SET DEF[INE] {& | c | ON | OFF}

Sets the character used to prefix substitution variables to *c*.

ON or OFF controls whether SQL*Plus will scan commands for substitution variables and replace them with their values. ON changes the value of *c* back to the default '&', not the most recently used character. The setting of DEFINE to OFF overrides the setting of the SCAN variable.

See [SET SCAN {ON | OFF} \(obsolete\)](#) on page C-4 for more information on the SCAN variable.

SET DESCRIBE [DEPTH {1 | n | ALL}] [LINENUM {ON | OFF}] [INDENT {ON | OFF}]

Sets the depth of the level to which you can recursively describe an object.

The valid range of the DEPTH clause is from 1 to 50. If you SET DESCRIBE DEPTH ALL, then the depth will be set to 50, which is the maximum level allowed. You can also display the line number and indentation of the attribute or column name when an object contains multiple object types. Use the SET LINESIZE command to control the width of the data displayed.

See [DESCRIBE](#) on page 12-51 for more information about describing objects.

Example

To create an object type ADDRESS, enter

```
CREATE TYPE ADDRESS AS OBJECT
  ( STREET VARCHAR2(20),
    CITY VARCHAR2(20)
  );
/
```

Type created

To create the table EMPLOYEE that contains a nested object, EMPADDR, of type ADDRESS, enter

```
CREATE TABLE EMPLOYEE
  (LAST_NAME VARCHAR2(30),
    EMPADDR ADDRESS,
    JOB_ID VARCHAR2(20),
    SALARY NUMBER(7,2)
  );
/
```

Table created

To describe the table EMPLOYEE to a depth of two levels, and to indent the output and display line numbers, enter:

```
SET DESCRIBE DEPTH 2 LINENUM ON INDENT ON
DESCRIBE employee
```

	Name	Null?	Type
1	LAST_NAME		VARCHAR2(30)
2	EMPADDR		ADDRESS
3	2 STREET		VARCHAR2(20)
4	2 CITY		VARCHAR2(20)
5	JOB_ID		VARCHAR2(20)
6	SALARY		NUMBER(7,2)

SET ECHO {ON | OFF}

Controls whether or not to echo commands in a script that is executed with @, @@ or START. ON displays the commands on screen. OFF suppresses the display. ECHO does not affect the display of commands you enter interactively or redirect to SQL*Plus from the operating system.

SET EDITF[ILE] *file_name*.[*ext*]

SET EDITFILE is not supported in *iSQL*Plus*

Sets the default filename for the EDIT command. See [EDIT](#) on page 12-58 for more information about the EDIT command. The default filename for the EDIT command is `afiedt.buf` which is the SQL buffer. The buffer has no command history list and does not record *SQL*Plus* commands.

You can include a path and/or file extension. See [SET SUF\[IX\] {SQL | text}](#) on page 12-145 for information on changing the default extension. The default filename and maximum filename length are operating system specific.

SET EMB[EDDED] {ON | OFF}

Controls where on a page each report begins.

OFF forces each report to start at the top of a new page. ON enables a report to begin anywhere on a page. Set EMBEDDED to ON when you want a report to begin printing immediately following the end of the previously run report.

SET ESC[APE] {\ | c | ON | OFF}

Defines the character used as the escape character.

OFF undefines the escape character. ON enables the escape character. ON changes the value of *c* back to the default "\".

You can use the escape character before the substitution character (set through SET DEFINE) to indicate that SQL*Plus should treat the substitution character as an ordinary character rather than as a request for variable substitution.

Example

If you define the escape character as an exclamation point (!), then

```
SET ESCAPE !
ACCEPT v1 PROMPT 'Enter !&1:'
displays this prompt:
```

```
Enter &1:
```

To set the escape character back to the default value of \ (backslash), enter

```
SET ESCAPE ON
```

SET FEED[BACK] {6 | *n* | ON | OFF}

Displays the number of records returned by a script when a script selects at least *n* records.

ON or OFF turns this display on or off. Turning feedback ON sets *n* to 1. Setting feedback to zero is equivalent to turning it OFF.

SET FEEDBACK OFF also turns off the statement confirmation messages such as 'Table created' and 'PL/SQL procedure successfully completed' that are displayed after successful SQL or PL/SQL statements.

SET FLAGGER {OFF | ENTRY | INTERMED[IATE] | FULL}

Checks to make sure that SQL statements conform to the ANSI/ISO SQL92 standard.

If any non-standard constructs are found, the Oracle Database Server flags them as errors and displays the violating syntax. This is the equivalent of the SQL language ALTER SESSION SET FLAGGER command.

You may execute SET FLAGGER even if you are not connected to a database. FIPS flagging will remain in effect across SQL*Plus sessions until a SET FLAGGER OFF (or ALTER SESSION SET FLAGGER = OFF) command is successful or you exit SQL*Plus.

When FIPS flagging is enabled, SQL*Plus displays a warning for the CONNECT, DISCONNECT, and ALTER SESSION SET FLAGGER commands, even if they are successful.

SET FLU[SH] {ON | OFF}

SET FLUSH is not supported in *iSQL*Plus*

Controls when output is sent to the user's display device. OFF enables the operating system to buffer output. ON disables buffering. FLUSH only affects display output, it does not affect spooled output.

Use OFF only when you run a script non-interactively (that is, when you do not need to see output and/or prompts until the script finishes running). The use of FLUSH OFF may improve performance by reducing the amount of program I/O.

SET HEA[DING] {ON | OFF}

Controls printing of column headings in reports.

ON prints column headings in reports; OFF suppresses column headings.

The SET HEADING OFF command does not affect the column width displayed, it only suppresses the printing of the column header itself.

Example

To suppress the display of column headings in a report, enter

```
SET HEADING OFF
```

If you then run a SQL SELECT command

```
SELECT LAST_NAME, SALARY  
FROM EMP_DETAILS_VIEW  
WHERE JOB_ID = 'AC_MGR';
```

the following output results:

Higgins 12000

To turn the display of column headings back on, enter

```
SET HEADING ON
```

SET HEADS[EP] {l | *c* | **ON | **OFF**}**

Defines the character used as a line break in column headings.

The heading separator character cannot be alphanumeric or white space. You can use the heading separator character in the COLUMN command and in the old forms of BTITLE and TTITLE to divide a column heading or title onto more than one line. ON or OFF turns heading separation on or off. When heading separation is OFF, SQL*Plus prints a heading separator character like any other character. ON changes the value of *c* back to the default "|".

The Heading Separator character (SET HEADSEP) is only supported in *i*SQL*Plus when the Preformatted Output preference is ON (SET MARKUP HTML PREFORMAT).

SET INSTANCE [*instance_path* | **LOCAL**]

Changes the default instance for your session to the specified instance path.

Using the SET INSTANCE command does not connect to a database. The default instance is used for commands when no instance is specified. Any commands preceding the first use of SET INSTANCE communicate with the default instance.

To reset the instance to the default value for your operating system, you can either enter SET INSTANCE with no *instance_path* or SET INSTANCE LOCAL.

Note, you can only change the instance when you are not currently connected to any instance. That is, you must first make sure that you have disconnected from the current instance, then set or change the instance, and reconnect to an instance in order for the new setting to be enabled.

This command may only be issued when Oracle Net is running. You can use any valid Oracle Net connect identifier as the specified instance path. See your operating system-specific Oracle Database documentation for a complete description of how your operating system specifies Oracle Net connect identifiers. The maximum length of the instance path is 64 characters.

Example

To set the default instance to "PROD1" enter

```
DISCONNECT  
SET INSTANCE PROD1
```

To set the instance back to the default of local, enter

```
SET INSTANCE local
```

You must disconnect from any connected instances to change the instance.

SET LIN[ESIZE] {80 | *n*}
SET LIN[ESIZE] {150 | *n*} in *iSQLPlus**

Sets the total number of characters that SQL*Plus displays on one line before beginning a new line.

It also controls the position of centered and right-aligned text in TTITLE, BTITLE, REPHEADER and REPFOOTER. Changing the linesize setting can affect text wrapping in output from the DESCRIBE command. DESCRIBE output columns are typically allocated a proportion of the linesize. Decreasing or increasing the linesize may give unexpected text wrapping in your display. You can define LINESIZE as a value from 1 to a maximum that is system dependent.

SET LOBOF[FSET] {1 | n}

Sets the starting position from which CLOB and NCLOB data is retrieved and displayed.

Example

To set the starting position from which a CLOB column's data is retrieved to the 22nd position, enter

```
SET LOBOFFSET 22
```

The CLOB data will wrap on your screen; SQL*Plus will not truncate until the 23rd character.

SET LOGSOURCE [*pathname*]

Specifies the location from which archive logs are retrieved during recovery.

The default value is set by the LOG_ARCHIVE_DEST initialization parameter in the Oracle Database initialization file, init.ora. Using the SET LOGSOURCE command without a *pathname* restores the default location.

Example

To set the default location of log files for recovery to the directory "/usr/oracle10/dbs/arch" enter

```
SET LOGSOURCE "/usr/oracle10/dbs/arch"  
RECOVER DATABASE
```

SET LONG {80 | n}

Sets maximum width (in bytes) for displaying CLOB, LONG, NCLOB and XMLType values; and for copying LONG values.

Querying LONG columns requires enough local memory to store the amount of data specified by SET LONG, irrespective of the value of the SET LONGCHUNKSIZE command. This requirement does not apply when querying LOBs.

It is recommended that you do not create tables with LONG columns. LONG columns are supported only for backward compatibility. Use LOB columns (CLOB, NCLOB) instead. LOB columns have fewer restrictions than LONG columns and are still being enhanced.

The maximum value of *n* is 2,000,000,000 bytes.

Example

To set the maximum number of bytes to fetch for displaying and copying LONG values, to 500, enter

```
SET LONG 500
```

The LONG data will wrap on your screen; SQL*Plus will not truncate until the 501st byte. The default for LONG is 80 bytes.

SET LONGC[HUNKSIZE] {80 | *n*}

Sets the size (in bytes) of the increments SQL*Plus uses to retrieve a CLOB, LONG, NCLOB or XMLType value.

LONGCHUNKSIZE is not used for object relational queries such as CLOB, or NCLOB.

Example

To set the size of the increments in which SQL*Plus retrieves LONG values to 100 bytes, enter

```
SET LONGCHUNKSIZE 100
```

The LONG data will be retrieved in increments of 100 bytes until the entire value is retrieved or the value of SET LONG is reached, whichever is the smaller.

SET MARK[UP] HTML [ON | OFF] [HEAD text] [BODY text] [TABLE text] [ENTMAP {ON | OFF}] [SPOOL {ON | OFF}] [PRE[FORMAT] {ON | OFF}]

Outputs HTML marked up text, which is the output used by *iSQL*Plus*.

Beware of using options which generate invalid HTML output in *iSQL*Plus* as it may corrupt the browser screen. The HEAD and BODY options may be useful for dynamic reports and for reports saved to local files.

To be effective, SET MARKUP commands that change values in dynamic report output must occur before statements that produce query output. The first statement that produces query output triggers the output of information affected by SET MARKUP such as HEAD and TABLE settings. Subsequent SET MARKUP commands have no effect on the information already sent to the report.

SET MARKUP only specifies that SQL*Plus output will be HTML encoded. You must use SET MARKUP HTML ON SPOOL ON and the SQL*Plus SPOOL command to create and name a spool file, and to begin writing HTML output to it. SET MARKUP has the same options and behavior as SQLPLUS -MARKUP.

See [MARKUP Options](#) on page 3-14 for detailed information. For examples of usage, see [SET MARK\[UP\] HTML \[ON | OFF\] \[HEAD text\] \[BODY text\] \[TABLE text\] \[ENTMAP {ON | OFF}\] \[SPOOL {ON | OFF}\] \[PRE\[FORMAT\] {ON | OFF}\]](#) on page 12-122, and [Generating HTML Reports from SQL*Plus](#) on page 7-1.

Use the SHOW MARKUP command to view the status of MARKUP options.

Example

The following is a script which uses the SET MARKUP HTML command to enable HTML marked up text to be spooled to a specified file:

Note: The SET MARKUP example command is laid out for readability using line continuation characters "-" and spacing. Command options are concatenated in normal entry.

Use your favorite text editor to enter the commands necessary to set up the HTML options and the query you want for your report.

```
SET MARKUP HTML ON SPOOL ON HEAD "<TITLE>SQL*Plus Report</title> -
<STYLE TYPE='TEXT/CSS'><!--BODY {background: ffff66} --></STYLE>"
SET ECHO OFF
SPOOL employee.htm
SELECT FIRST_NAME, LAST_NAME, SALARY
FROM EMP_DETAILS_VIEW
WHERE SALARY>12000;
SPOOL OFF
SET MARKUP HTML OFF
SET ECHO ON
```

As this script contains SQL*Plus commands, do not attempt to run it with / (slash) from the buffer because it will fail. Save the script in your text editor and use START to execute it:

```
START employee.sql
```

As well as writing the HTML spool file, employee.htm, the output is also displayed on screen because SET TERMOUT defaults to ON. You can view the spool file, employee.htm, in your web browser. It should appear something like the following:

FIRST_NAME	LAST_NAME	SALARY
Steven	King	24000
Neena	Kochhar	17000
Lex	De Haan	17000
Michael	Hartstein	13000
John	Russell	14000
Karen	Partners	13500

6 rows selected.

SET NEWP[AGE] {1 | n | NONE}

Sets the number of blank lines to be printed from the top of each page to the top title. A value of zero places a formfeed at the beginning of each page (including the first page) and clears the screen on most terminals. If you set NEWPAGE to NONE, SQL*Plus does not print a blank line or formfeed between the report pages.

SET NULL *text*

Sets the text displayed whenever a null value occurs in the result of a SQL SELECT command.

Use the NULL clause of the COLUMN command to override the setting of the NULL variable for a given column. The default output for a null is blank ("").

SET NUMF[ORMAT] *format*

Sets the default format for displaying numbers. See the FORMAT clause of the [COLUMN](#) command on page 12-28 for number format descriptions. Enter a number format for *format*. To use the default field width and formatting model specified by SET NUMWIDTH, enter

```
SET NUMFORMAT ""
```

SET NUM[WIDTH] {10 | *n*}

Sets the default width for displaying numbers. See the `FORMAT` clause of the [COLUMN](#) on page 12-28 command for number format descriptions.

`COLUMN FORMAT` settings take precedence over `SET NUMFORMAT` settings, which take precedence over `SET NUMWIDTH` settings.

SET PAGESIZE {14 | n}

Sets the number of rows on each page of output in *iSQL*Plus*, and the number of lines on each page of output in command-line and Windows GUI. You can set PAGESIZE to zero to suppress all headings, page breaks, titles, the initial blank line, and other formatting information.

In *iSQL*Plus*, sets the number of rows displayed on each page. Error and informational messages are not counted in the page size, so pages may not always be exactly the same length. The default pagesize for *iSQL*Plus* is 24.

SET PAU[SE] {ON | OFF | *text*}

Enables you to control scrolling of your terminal when running reports. You need to first, SET PAUSE *text*, and then SET PAUSE ON if you want text to appear each time SQL*Plus pauses.

In command-line and Windows GUI, SET PAUSE ON pauses output at the beginning of each PAGESIZE number of lines of report output. Press Return to view more output. SET PAUSE *text* specifies the text to be displayed each time SQL*Plus pauses. Multiple words in *text* must be enclosed in single quotes.

You can embed terminal-dependent escape sequences in the PAUSE command. These sequences allow you to create inverse video messages or other effects on terminals that support such characteristics.

In *iSQL*Plus*, SET PAUSE ON displays the value of *text*, then pauses output and displays a Next Page button after PAGESIZE number of rows of report output. Click the Next Page button to view more report output. The Next Page button is not displayed on the final page of output.

SET RECSEP {WRAPPED | EACH | OFF}

RECSEP tells SQL*Plus where to make the record separation.

For example, if you set RECSEP to WRAPPED, SQL*Plus prints a record separator only after wrapped lines. If you set RECSEP to EACH, SQL*Plus prints a record separator following every row. If you set RECSEP to OFF, SQL*Plus does not print a record separator.

The Display Record Separator preference (SET RECSEP) is only supported in iSQL*Plus when Preformatted Output is On (SET MARKUP HTML PREFORMAT).

SET RECSEPCHAR { | c}

Defines the character to display or print to separate records.

A record separator consists of a single line of the RECSEPCHAR (record separating character) repeated LINESIZE times. The default is a single space.

SET SERVEROUT[PUT] {ON | OFF} [SIZE {n | UNL[IMITED]]] [FOR[MAT] {WRA[PPED] | WOR[D_WRAPPED] | TRU[NCATED]]}

Controls whether to display output (that is, DBMS_OUTPUT.PUT_LINE) of stored procedures or PL/SQL blocks in SQL*Plus. The DBMS_OUTPUT line length limit is 32767 bytes.

OFF suppresses the output of DBMS_OUTPUT.PUT_LINE. ON displays the output.

ON uses the SIZE and FORMAT of the previous SET SERVEROUTPUT ON SIZE *n* FORMAT *f*, or uses default values if no SET SERVEROUTPUT command was previously issued in the current connection.

SIZE sets the number of bytes of the output that can be buffered within the Oracle Database server. The default is UNLIMITED. *n* cannot be less than 2000 or greater than 1,000,000. In *i*SQL*Plus you can enter the word UNLIMITED in the Size field of the Script Formatting Preferences screen.

Resources are not pre-allocated when SERVEROUTPUT is set. As there is no performance penalty, use UNLIMITED unless you want to conserve physical memory.

Every server output line begins on a new output line.

When WRAPPED is enabled SQL*Plus wraps the server output within the line size specified by SET LINESIZE, beginning new lines when required.

When WORD_WRAPPED is enabled, each line of server output is wrapped within the line size specified by SET LINESIZE. Lines are broken on word boundaries. SQL*Plus left justifies each line, skipping all leading whitespace.

When TRUNCATED is enabled, each line of server output is truncated to the line size specified by SET LINESIZE.

For detailed information about using UTL_FILE and associated utilities, see the *Oracle Database PL/SQL Packages and Types Reference*.

For more information on DBMS_OUTPUT.PUT_LINE, see your *Oracle Database Application Developer's Guide - Fundamentals*.

Example

To enable text display in a PL/SQL block using DBMS_OUTPUT.PUT_LINE, enter

```
SET SERVEROUTPUT ON
```

The following example shows what happens when you execute an anonymous procedure with SET SERVEROUTPUT ON:

```
BEGIN
  DBMS_OUTPUT.PUT_LINE('Task is complete');
END;
/
```

```
Task is complete.
PL/SQL procedure successfully completed.
```

The following example shows what happens when you create a trigger with SET SERVEROUTPUT ON:

```
CREATE TABLE SERVER_TAB (Letter CHAR);
CREATE TRIGGER SERVER_TRIG BEFORE INSERT OR UPDATE -
```

```

OR DELETE
ON SERVER_TAB
BEGIN
DBMS_OUTPUT.PUT_LINE('Task is complete.');
```

```

Trigger Created.
```

```

INSERT INTO SERVER_TAB VALUES ('M');
DROP TABLE SERVER_TAB;
/* Remove SERVER_TAB from database */
```

```

Task is complete.
1 row created.
```

To set the output to `WORD_WRAPPED`, enter

```

SET SERVEROUTPUT ON FORMAT WORD_WRAPPED
SET LINESIZE 20
BEGIN
  DBMS_OUTPUT.PUT_LINE('If there is nothing left to do');
  DBMS_OUTPUT.PUT_LINE('shall we continue with plan B?');
END;
/
```

```

If there is nothing
left to do
shall we continue
with plan B?
```

To set the output to `TRUNCATED`, enter

```

SET SERVEROUTPUT ON FORMAT TRUNCATED
SET LINESIZE 20
BEGIN
  DBMS_OUTPUT.PUT_LINE('If there is nothing left to do');
  DBMS_OUTPUT.PUT_LINE('shall we continue with plan B?');
END;
/
```

```

If there is nothing
shall we continue wi
```

SET SHIFT[INOUT] {VIS[IBLE] | INV[ISIBLE]}

SET SHIF^TINOUT is not supported in *i*SQL*Plus

Enables correct alignment for terminals that display shift characters. The SET SHIF^TINOUT command is useful for terminals which display shift characters together with data (for example, IBM 3270 terminals). You can only use this command with shift sensitive character sets (for example, JA16DBCS).

Use VISIBLE for terminals that display shift characters as a visible character (for example, a space or a colon). INVISIBLE is the opposite and does not display any shift characters.

Example

To enable the display of shift characters on a terminal that supports them, enter

```
SET SHIFTINOUT VISIBLE
SELECT LAST_NAME, JOB_ID FROM EMP_DETAILS_VIEW
WHERE SALARY > 12000;
```

LAST_NAME	JOB_ID
-----	-----
:JJOO:	:AABBCC:
:AA:abc	:DDEE:e

where ":" = visible shift character

uppercase represents multibyte characters

lowercase represents singlebyte characters

SET SHOW[MODE] {ON | OFF}

SET SHOWMODE is not supported in *i*SQL*Plus

Controls whether SQL*Plus lists the old and new settings of a SQL*Plus system variable when you change the setting with SET. ON lists the settings; OFF suppresses the listing. SHOWMODE ON has the same behavior as the obsolete SHOWMODE BOTH.

SET SQLBL[ANKLINES] {ON | OFF}

SET SQLBLANKLINES is not supported in *iSQL*Plus*

Controls whether SQL*Plus puts blank lines within a SQL command or script. ON interprets blank lines and new lines as part of a SQL command or script. OFF, the default value, does not allow blank lines or new lines in a SQL command or script or script.

Enter the BLOCKTERMINATOR to stop SQL command entry without running the SQL command. Enter the SQLTERMINATOR character to stop SQL command entry and run the SQL statement.

Example

To allow blank lines in a SQL statement, enter

```
SET SQLBLANKLINES ON
REM Using the SQLTERMINATOR (default is ";")
REM Could have used the BLOCKTERMINATOR (default is ".")
SELECT *

FROM

DUAL

;
```

The following output results:

D
-
X

SET SQLC[ASE] {MIX[ED] | LO[WER] | UP[PER]}

Converts the case of SQL commands and PL/SQL blocks just prior to execution.

SQL*Plus converts all text within the command, including quoted literals and identifiers, to uppercase if SQLCASE equals UPPER, to lowercase if SQLCASE equals LOWER, and makes no changes if SQLCASE equals MIXED.

SQLCASE does not change the SQL buffer itself.

SET SQLCO[NTINUE] {≥ | *text*}

SET SQLCONTINUE is not supported in *iSQL*Plus*

Sets the character sequence *SQL*Plus* displays as a prompt after you continue a *SQL*Plus* command on an additional line using a hyphen (-).

Example

To set the *SQL*Plus* command continuation prompt to an exclamation point followed by a space, enter

```
SET SQLCONTINUE '! '
```

*SQL*Plus* will prompt for continuation as follows:

```
TTITLE 'MONTHLY INCOME' -  
! RIGHT SQL.PNO SKIP 2 -  
! CENTER 'PC DIVISION'
```

The default continuation prompt is ">".

SET SQLN[UMBER] {ON | OFF}

SET SQLNUMBER is not supported in *iSQL*Plus*

Sets the prompt for the second and subsequent lines of a SQL command or PL/SQL block. ON sets the prompt to be the line number. OFF sets the prompt to the value of SQLPROMPT.

SET SQLPLUSCOMPAT[IBILITY] {x.y[.z]}

Sets the behavior to that of the release or version specified by *x.y[.z]*.

Where *x* is the version number, *y* is the release number, and *z* is the update number. For example, 8.1.7, 9.0.1 or 10.2. The features affected by SQLPLUSCOMPATIBILITY are tabulated in the SQL*Plus Compatibility Matrix shown. You can also set the value of SQLPLUSCOMPATIBILITY using the -C[OMPATIBILITY] argument of the SQLPLUS command when starting SQL*Plus from the command line.

The default setting for SQLPLUSCOMPATIBILITY is the value of the SQL*Plus client.

It is recommended that you add SET SQLPLUSCOMPATIBILITY 10.2.0 to your scripts to maximize their compatibility with future versions of SQL*Plus.

SQL*Plus Compatibility Matrix

The SQL*Plus Compatibility Matrix tabulates behavior affected by each SQL*Plus compatibility setting. SQL*Plus compatibility modes can be set in three ways:

- You can include a SET SQLPLUSCOMPATIBILITY command in your site or user profile. On installation, there is no SET SQLPLUSCOMPATIBILITY setting in glogin.sql. Therefore the default compatibility is 10.2.
- You can use the SQLPLUS -C[OMPATIBILITY] {x.y[.z]} command argument at startup to set the compatibility mode of that session.
- You can use the SET SQLPLUSCOMPATIBILITY {x.y[.z]} command during a session to set the SQL*Plus behavior you want for that session.

The following table shows the release of SQL*Plus which introduced the behavior change, and hence the minimum value of SQLPLUSCOMPATIBILITY to obtain that behavior. For example, to obtain the earlier behavior of the VARIABLE command, you must either use a version of SQL*Plus earlier than 9.0.1, or you must use a SQLPLUSCOMPATIBILITY value of less than 9.0.1. The lowest value that can be set for SQLPLUSCOMPATIBILITY is 7.3.4

Table 12–4 Compatibility Matrix

Value	Consequence	When available
>=10.1	SHOW ERRORS sorts PL/SQL error messages using new columns only available in Oracle Database 10g.	10.1
>=10.1	SPOOL Options CREATE, REPLACE, SAVE were added which may affect filename parsing on some platforms.	10.1
>=10.1	SET SQLPROMPT	10.1
>=10.1	Whitespace characters are allowed in Windows file names that are enclosed in quotes. Some other special punctuation characters are now disallowed in Windows.	10.1
>=10.1	Glogin/login files are called for each reconnect.	10.1
<10.1	Uses the obsolete DOC> prompt when echoing /* comments.	10.1
>= 9.2	A wide column defined FOLD_AFTER may be displayed at the start of a new line. Otherwise it is incorrectly put at the end of the preceding line with a smaller width than expected.	9.2.
>= 9.0	Whitespace before a slash ("/") in a SQL statement is ignored and the slash is taken to mean execute the statement. Otherwise the slash is treated as part of the statement, for example, as a division sign.	9.0.1.4.

Table 12–4 (Cont.) Compatibility Matrix

Value	Consequence	When available
>= 9.0	The length specified for NCHAR and NVARCHAR2 types is characters. Otherwise the length may represent bytes or characters depending on the character set.	9.0.1

SET SQLPRE[FIX] {# | c}

SET SQLPREFIX is not supported in *iSQL*Plus*

Sets the SQL*Plus prefix character. While you are entering a SQL command or PL/SQL block, you can enter a SQL*Plus command on a separate line, prefixed by the SQL*Plus prefix character. SQL*Plus will execute the command immediately without affecting the SQL command or PL/SQL block that you are entering. The prefix character must be a non-alphanumeric character.

SET SQLP[ROMPT] {SQL> | *text*}

SET SQLPROMPT is not supported in *iSQL*Plus*

Sets the SQL*Plus command prompt. SET SQLPROMPT substitute variables dynamically. This enables the inclusion of runtime variables such as the current connection identifier. Substitution variables used in SQLPROMPT do not have to be prefixed with '&', and they can be used and accessed like any other substitution variable. Variable substitution is not attempted for the default prompt, "SQL>".

Variable substitution occurs each time SQLPROMPT is SET. If SQLPROMPT is included in glogin.sql, then substitution variables in SQLPROMPT are refreshed with each login or connect.

Example

To change your SQL*Plus prompt to display your connection identifier, enter:

```
SET SQLPROMPT "_CONNECT_IDENTIFIER > "
```

To set the SQL*Plus command prompt to show the current user, enter

```
SET SQLPROMPT "_USER > "
```

To change your SQL*Plus prompt to display your the current date, the current user and the users privilege level, enter:

```
SET SQLPROMPT "_DATE _USER _PRIVILEGE> "
```

To change your SQL*Plus prompt to display a variable you have defined, enter:

```
DEFINE mycon = Prod1
SET SQLPROMPT "mycon> "
```

```
Prod1>
```

Text in nested quotes is not parsed for substitution. To have a SQL*Plus prompt of your username, followed by "@", and then your connection identifier, enter:

```
SET SQLPROMPT "_USER'@'_CONNECT_IDENTIFIER > "
```

SET SQLT[ERMINATOR] {; | c | ON | OFF}

Sets the character used to end script or data entry for PL/SQL blocks or SQL statements, to execute the script, and to load it into the buffer.

It cannot be an alphanumeric character or a whitespace. OFF means that SQL*Plus recognizes no command terminator; you terminate a SQL command by entering an empty line or a slash (/). If SQLBLANKLINES is set ON, you must use the BLOCKTERMINATOR to terminate a SQL command. ON resets the terminator to the default semicolon (;).

SET SUF[FIX] {SQL | *text*}

SET SUFFIX is not supported in *iSQL*Plus*

Sets the default file extension that SQL*Plus uses in commands that refer to scripts. SUFFIX does not control extensions for spool files.

Example

To change the default command-file extension from the default, .SQL to .TXT, enter

```
SET SUFFIX TXT
```

If you then enter

```
GET EXAMPLE
```

SQL*Plus will look for a file named EXAMPLE.TXT instead of EXAMPLE.SQL.

SET TAB {ON | OFF}

SET TAB is not supported in *iSQL*Plus*

Determines how SQL*Plus formats white space in terminal output. OFF uses spaces to format white space in the output. ON uses the TAB character. TAB settings are every eight characters. The default value for TAB is system dependent.

SET TERM[OUT] {ON | OFF}

SET TERMOUT is not supported in *iSQL*Plus*

Controls the display of output generated by commands in a script that is executed with @, @@ or START. OFF suppresses the display so that you can spool output to a file without displaying the output on screen. ON displays the output on screen. TERMOUT OFF does not affect output from commands you enter interactively or redirect to SQL*Plus from the operating system.

SET TI[ME] {ON | OFF}

SET TIME is not supported in *iSQL*Plus*

Controls the display of the current time. ON displays the current time before each command prompt. OFF suppresses the time display.

SET TIMI[NG] {ON | OFF}

Controls the display of timing statistics.

ON displays timing statistics on each SQL command or PL/SQL block run. OFF suppresses timing of each command.

See [TIMING](#) on page 12-173 for information on timing multiple commands.

SET TRIM[OUT] {ON | OFF}

SET TRIMOUT is not supported in *iSQL*Plus*

Determines whether SQL*Plus puts trailing blanks at the end of each displayed line. ON removes blanks at the end of each line, improving performance especially when you access SQL*Plus from a slow communications device. OFF enables SQL*Plus to display trailing blanks. TRIMOUT ON does not affect spooled output.

SET TRIMS[POOL] {ON | OFF}

SET TRIMSPOOL is not supported in *iSQL*Plus*

Determines whether *SQL*Plus* puts trailing blanks at the end of each spooled line. ON removes blanks at the end of each line. OFF enables *SQL*Plus* to include trailing blanks. TRIMSPOOL ON does not affect terminal output.

SET UND[ERLINE] {- | c | ON | OFF}

Sets the character used to underline column headings in reports. The underline character cannot be an alphanumeric character or a white space. ON or OFF turns underlining on or off. ON changes the value of *c* back to the default "-".

SET UNDERLINE is only supported in *iSQL*Plus* when preformatted output is On (SET MARKUP HTML PREFORMAT).

SET VER[IFY] {ON | OFF}

Controls whether to list the text of a SQL statement or PL/SQL command before and after replacing substitution variables with values. ON lists the text; OFF suppresses the listing.

SET WRA[P] {ON | OFF}

Controls whether to truncate the display of a selected row if it is too long for the current line width. OFF truncates the selected row; ON enables the selected row to wrap to the next line.

Use the WRAPPED and TRUNCATED clauses of the COLUMN command to override the setting of WRAP for specific columns.

The Wrap Lines preference (SET WRAP) is only supported in *iSQL*Plus* when Preformatted Output is On (SET MARKUP HTML PREFORMAT).

SET XQUERY BASEURI {*text*}

Specifies the base URI used to resolve relative URIs in functions. It enables the prefix of the file accessed by an XQuery to be changed.

To unset the BASEURI, set an empty string, for example:

```
SET XQUERY BASEURI ''
```

Take care to enter valid values as values are checked only when an XQUERY command is issued.

Example

```
SET XQUERY BASEURI '/public/hr'  
XQUERY for $i in doc("foo.xml") return $i  
/
```

This is equivalent to:

```
XQuery declare base-uri "/public/hr";  
for $i in doc("foo.xml") return $i
```

SET XQUERY ORDERING {UNORDERED | ORDERED | DEFAULT}

Sets the ordering of output from an XQuery. There are three values:

UNORDERED specifies that results are sorted in the order they are retrieved from the database.

ORDERED specifies that results are sorted as defined by the XQuery.

DEFAULT specifies the database default. In Oracle Database 10g the default is UNORDERED.

When SET XQUERY ORDERING is not set, the default is DEFAULT (UNORDERED).

Example

```
SET XQUERY ORDERING ORDERED
XQUERY for $i in doc("foo.xml") return $i
/
```

This is equivalent to:

```
XQuery declare ordering ordered;
for $i in doc("foo.xml") return $i
/
```

SET XQUERY NODE {BYVALUE | BYREFERENCE | DEFAULT}

Sets the node identity preservation mode. The preservation mode applies to all expressions that either create a new node (such as element constructors) or return an item or sequence containing nodes (such as path expressions). There are three values:

BYVALUE specifies that the node identity need not be preserved. This means that any node operation such as creation, or that is returned as a result of an expression is deep copied and loses its context from the original tree. Subsequent operations on this node that test for node identity, parent or sibling axes or ordering will be undefined.

BYREFERENCE specifies that node identities are to be preserved. Subsequent operations on this node preserve the node's context and definition.

DEFAULT specifies the database default. In Oracle Database 10g the default is BYVALUE.

When SET XQUERY NODE is not set, the default is DEFAULT (BYVALUE).

Example

```
SET XQUERY NODE BYREFERENCE
XQUERY for $i in doc("foo.xml") return $i
/
```

This is equivalent to:

```
XQuery declare node byreference;
for $i in doc("foo.xml") return $i
/
```

SET XQUERY CONTEXT {text}

Specifies an XQuery context item expression. A context item expression evaluates to the context item, which may be either a node (as in the expression `fn:doc("bib.xml")//book[fn:count(/author)>1]`), or an atomic value (as in the expression `(1 to 100)[. mod 5 eq 0]`).

To unset the XQUERY CONTEXT, set an empty string, for example:

```
SET XQUERY CONTEXT ''
```

Take care to enter valid values as values are checked only when an XQUERY command is issued.

Example

```
SET XQUERY CONTEXT 'doc("foo.xml")'  
XQUERY for $i in /a return $i  
/
```

This is equivalent to:

```
XQuery for $i in /a return $i  
passing XMLQuery("doc('foo.xml')")  
/
```

SHOW

Syntax

SHO[W] *option*

where *option* represents one of the following terms or clauses:

system_variable

ALL

BTI[TLE]

ERR[ORS] [{ FUNCTION | PROCEDURE | PACKAGE | PACKAGE BODY | TRIGGER
| VIEW | TYPE | TYPE BODY | DIMENSION | JAVA CLASS } [*schema.name*]

LNO

PARAMETERS [*parameter_name*]

PNO

RECYC[LEBIN] [*original_name*]

REL[EASE]

REPF[OOTER]

REPH[EADER]

SGA

SPOO[L] (Not available in iSQL*Plus)

SQLCODE

TTI[TLE]

USER

XQUERY

Shows the value of a SQL*Plus system variable or the current SQL*Plus environment. SHOW SGA requires a DBA privileged login.

Terms

system_variable

Represents any system variable set by the SET command.

ALL

Lists the settings of all SHOW options, except ERRORS and SGA, in alphabetical order.

BTI[TLE]

Shows the current BTITLE definition.

ERR[ORS] [{FUNCTION | PROCEDURE | PACKAGE | PACKAGE BODY | TRIGGER
| VIEW | TYPE | TYPE BODY | DIMENSION | JAVA CLASS} [*schema.name*]

Shows the compilation errors of a stored procedure (includes stored functions, procedures, and packages). After you use the CREATE command to create a stored procedure, a message is displayed if the stored procedure has any compilation errors. To see the errors, you use SHOW ERRORS.

When you specify SHOW ERRORS with no arguments, SQL*Plus shows compilation errors for the most recently created or altered stored procedure. When you specify the type (function, procedure, package, package body, trigger, view, type, type body, dimension, or java class) and the name of the PL/SQL stored procedure, SQL*Plus shows errors for that stored procedure. For more information on compilation errors, see your PL/SQL User's Guide and Reference.

schema contains the named object. If you omit *schema*, SHOW ERRORS assumes the object is located in your current schema.

SHOW ERRORS output displays the line and column number of the error (LINE/COL) as well as the error itself (ERROR). LINE/COL and ERROR have default widths of 8 and 65, respectively. You can use the COLUMN command to alter the default widths.

LNO

Shows the current line number (the position in the current page of the display and/or spooled output).

PARAMETERS [*parameter_name*]

Displays the current values for one or more initialization parameters. You can use a string after the command to see a subset of parameters whose names include that string. For example, if you enter:

```
SHOW PARAMETERS COUNT
```

NAME	TYPE	VALUE
-----	----	-----
db_file_multiblock_read_count	integer	12
spin_count	integer	0

The SHOW PARAMETERS command, without any string following the command, displays all initialization parameters.

The column names and formats used in the SHOW PARAMETERS output is set in the site profile file, glogin.sql. The value column display may be truncated.

Your output may vary depending on the version and configuration of the Oracle Database server to which you are connected. You need SELECT ON V_\$PARAMETER object privileges to use the PARAMETERS clause, otherwise you will receive a message

```
ORA-00942: table or view does not exist
```

PNO

Shows the current page number.

RECYC[LEBIN] [*original_name*]

Shows objects in the recycle bin that can be reverted with the FLASHBACK BEFORE DROP command. You do not need to remember column names, or interpret the less readable output from the query:

```
SELECT * FROM USER_RECYCLEBIN
```

The query returns four columns displayed in the following order:

Column Name	Description
ORIGINAL NAME	Shows the original name used when creating the object.
RECYCLEBIN NAME	Shows the name used to identify the object in the recyclebin.
OBJECT TYPE	Shows the type of the object.
DROP TIME	Shows the time when the object was dropped.

The output columns can be formatted with the COLUMN command. The default COLUMN formatting is in the site profile, glogin.sql.

For DBAs, the command lists their own objects as they have their own user_recyclebin view.

REL[EASE]

Shows the release number of Oracle Database that SQL*Plus is accessing.

REPF[OOTER]

Shows the current REPFOOTER definition.

REPH[EADER]

Shows the current REPHEADER definition.

SPOO[L]

Shows whether output is being spooled.

SGA

Displays information about the current instance's System Global Area. You need SELECT ON V_\$SGA object privileges otherwise you will receive a message

```
ORA-00942: table or view does not exist
```

SQLCODE

Shows the value of SQL.SQLCODE (the SQL return code of the most recent operation).

TTI[TLE]

Shows the current TTITLE definition.

USER

Shows the username you are currently using to access SQL*Plus. If you connect as "/ AS SYSDBA", then the SHOW USER command displays

```
USER is "SYS"
```

XQUERY

Shows the current values of the XQUERY settings, BASEURI, CONTEXT, NODE and ORDERING.

```
xquery BASEURI "public/scott" CONTEXT "doc("test.xml")" NODE byreference ORDERING
ordered
```

The following output is displayed when no values are set:

```
xquery BASEURI "" CONTEXT "" NODE default ORDERING default
```

Examples

To display information about the SGA, enter

```
SHOW SGA
```

Total System Global Area	7629732 bytes
Fixed Size	60324 bytes
Variable Size	6627328 bytes
Database Buffers	409600 bytes
Redo Buffers	532480 bytes

The following example illustrates how to create a stored procedure and then show its compilation errors:

```
CONNECT SYSTEM/MANAGER
CREATE PROCEDURE HR.PROC1 AS
BEGIN
:P1 := 1;
END;
/
```

```
Warning: Procedure created with compilation errors.
```

```
SHOW ERRORS PROCEDURE PROC1
```

```
NO ERRORS.
```

```
SHOW ERRORS PROCEDURE HR.PROC1
```

```
Errors for PROCEDURE HR PROC1:
LINE/COL ERROR
-----
3/3      PLS-00049: bad bind variable 'P1'
```

To show whether AUTORECOVERY is enabled, enter

```
SHOW AUTORECOVERY
```

```
AUTORECOVERY ON
```

To display the connect identifier for the default instance, enter

```
SHOW INSTANCE
```

```
INSTANCE "LOCAL"
```

To display the location for archive logs, enter

```
SHOW LOGSOURCE
```

```
LOGSOURCE "/usr/oracle90/dbs/arch"
```

To display objects that can be reverted with the FLASHBACK commands where CJ1 and ABC were objects dropped, enter:

```
SHOW RECYCLEBIN
```

ORIGINAL NAME	RECYCLEBIN NAME	OBJECT TYPE	DROP TIME
-----	-----	-----	-----
CJ1	RB\$\$29458\$TABLE\$0	TABLE	2003-01-22:14:54:07
ABC	RB\$\$29453\$TABLE\$0	TABLE	2003-01-20:18:50:29

To restore CJ1, enter

```
FLASHBACK TABLE CJ1 TO BEFORE DROP;
```

SHUTDOWN

Syntax

SHUTDOWN [ABORT | IMMEDIATE | NORMAL | TRANSACTIONAL [LOCAL]]

Shuts down a currently running Oracle Database instance, optionally closing and dismounting a database.

Terms

ABORT

Proceeds with the fastest possible shutdown of the database without waiting for calls to complete or users to disconnect.

Uncommitted transactions are not rolled back. Client SQL statements currently being processed are terminated. All users currently connected to the database are implicitly disconnected and the next database startup will require instance recovery.

You must use this option if a background process terminates abnormally.

IMMEDIATE

Does not wait for current calls to complete or users to disconnect from the database.

Further connects are prohibited. The database is closed and dismounted. The instance is shutdown and no instance recovery is required on the next database startup.

NORMAL

NORMAL is the default option which waits for users to disconnect from the database.

Further connects are prohibited. The database is closed and dismounted. The instance is shutdown and no instance recovery is required on the next database startup.

TRANSACTIONAL [LOCAL]

Performs a planned shutdown of an instance while allowing active transactions to complete first. It prevents clients from losing work without requiring all users to log off.

No client can start a new transaction on this instance. Attempting to start a new transaction results in disconnection. After completion of all transactions, any client still connected to the instance is disconnected. Now the instance shuts down just as it would if a SHUTDOWN IMMEDIATE statement was submitted. The next startup of the database will not require any instance recovery procedures.

The LOCAL mode specifies a transactional shutdown on the local instance only, so that it only waits on local transactions to complete, not all transactions. This is useful, for example, for scheduled outage maintenance.

Usage

SHUTDOWN with no arguments is equivalent to SHUTDOWN NORMAL.

You must be connected to a database as SYSOPER, or SYSDBA. You cannot connect through a multi-threaded server. See [CONNECT](#) on page 12-41 for more information about connecting to a database.

Examples

To shutdown the database in normal mode, enter

SHUTDOWN

```
Database closed.  
Database dismounted.  
Oracle instance shut down.
```

SPOOL

SPOOL is not available in *iSQL*Plus*.

Syntax

SPO[OL] [*file_name*].*ext*] [CRE[ATE] | REP[LACE] | APP[END]] | OFF | OUT]

Stores query results in a file, or optionally sends the file to a printer. In *iSQL*Plus*, use the preference settings to direct output to a file.

Terms

file_name].*ext*]

Represents the name of the file to which you wish to spool. SPOOL followed by *file_name* begins spooling displayed output to the named file. If you do not specify an extension, SPOOL uses a default extension (LST or LIS on most systems). The extension is not appended to system files such as /dev/null and /dev/stderr.

CRE[ATE]

Creates a new file with the name specified.

REP[LACE]

Replaces the contents of an existing file. If the file does not exist, REPLACE creates the file. This is the default behavior.

APP[END]

Adds the contents of the buffer to the end of the file you specify.

OFF

Stops spooling.

OUT

Stops spooling and sends the file to your computer's standard (default) printer. This option is not available on some operating systems.

Enter SPOOL with no clauses to list the current spooling status.

Usage

To spool output generated by commands in a script without displaying the output on the screen, use SET TERMOUT OFF. SET TERMOUT OFF does not affect output from commands that run interactively.

You must use quotes around file names containing white space.

To create a valid HTML file using SPOOL APPEND commands, you must use PROMPT or a similar command to create the HTML page header and footer. The SPOOL APPEND command does not parse HTML tags.

SET SQLPLUSCOMPAT[IBILITY] to 9.2 or earlier to disable the CREATE, APPEND and SAVE parameters. See [SQL*Plus Compatibility Matrix](#) on page 12-140 to determine what functionality is controlled by the SET SQLPLUSCOMPAT[IBILITY] command.

Examples of SPOOL Command

To record your output in the new file DIARY using the default file extension, enter

```
SPOOL DIARY CREATE
```

To append your output to the existing file DIARY, enter

```
SPOOL DIARY APPEND
```

To record your output to the file DIARY, overwriting the existing content, enter

```
SPOOL DIARY REPLACE
```

To stop spooling and print the file on your default printer, enter

```
SPOOL OUT
```

START

Syntax

```
START {url | file_name[.ext]} [arg...]
```

Runs the SQL*Plus statements in the specified script. The script can be called from the local file system or from a web server. Only the *url* form is supported in *iSQL*Plus*. You can pass values to script variables in the usual way.

Terms

url

Specifies the Uniform Resource Locator of a script to run on the specified web server. SQL*Plus supports HTTP and FTP protocols, but not HTTPS. HTTP authentication in the form `http://username:password@machine_name.domain...` is not supported in this release.

file_name[.ext]

The script you wish to execute. The file can contain any command that you can run interactively.

If you do not specify an extension, SQL*Plus assumes the default command-file extension (normally SQL). See [SET SUF\[**FIX**\] {SQL | text}](#) on page 12-145 for information on changing the default extension.

When you enter `START file_name.ext`, SQL*Plus searches for a file with the filename and extension you specify in the current default directory. If SQL*Plus does not find such a file, SQL*Plus will search a system-dependent path to find the file. Some operating systems may not support the path search. See the platform-specific Oracle documentation provided for your operating system for specific information related to your operating system environment.

arg ...

Data items you wish to pass to parameters in the script. If you enter one or more arguments, SQL*Plus substitutes the values into the parameters (&1, &2, and so forth) in the script. The first argument replaces each occurrence of &1, the second replaces each occurrence of &2, and so on.

The START command defines the parameters with the values of the arguments; if you START the script again in this session, you can enter new arguments or omit the arguments to use the old values.

See [Defining Substitution Variables](#) on page 5-11 and [Substitution Variables in iSQL*Plus](#) on page 5-17 for more information on using parameters.

Usage

All previous settings like COLUMN command settings stay in effect when the script starts. If the script changes any setting, then this new value stays in effect after the script has finished

The @ ("at" sign) and @@ (double "at" sign) commands function similarly to START. Disabling the START command in the Product User Profile also disables the @ and @@ commands. See [@ \("at" sign\)](#) on page 12-5 and [@@ \(double "at" sign\)](#) on page 12-7 for further information on these commands. See [Disabling SQL*Plus, SQL, and PL/SQL Commands](#) on page 9-3 for more information.

The EXIT or QUIT command in a script terminates SQL*Plus.

Examples

A file named PROMOTE with the extension SQL, used to promote employees, might contain the following command:

```
SELECT FIRST_NAME, LAST_NAME, JOB_ID, SALARY
FROM EMP_DETAILS_VIEW
WHERE JOB_ID='&1' AND SALARY>&2;
```

To run this script, enter

```
START PROMOTE ST_MAN 7000
```

or if it is located on a web server, enter a command in the form:

```
START HTTP://machine_name.domain:port/PROMOTE.SQL ST_MAN 7000
```

Where *machine_name.domain* must be replaced by the host.domain name, and *port* by the port number used by the web server where the script is located.

The following command is executed:

```
SELECT LAST_NAME, LAST_NAME
FROM EMP_DETAILS_VIEW
WHERE JOB_ID='ST_MAN' AND SALARY>7000;
```

and the results displayed.

STARTUP

Syntax

STARTUP *options* | *upgrade_options*

where *options* has the following syntax:

```
[FORCE] [RESTRICT] [PFILE=filename] [QUIET] [ MOUNT [dbname] |
[ OPEN [open_options] [dbname] ] | NOMOUNT ]
```

where *open_options* has the following syntax:

```
READ {ONLY | WRITE [RECOVER]} | RECOVER
```

and where *upgrade_options* has the following syntax:

```
[PFILE=filename] {UPGRADE | DOWNGRADE} [QUIET]
```

Starts an Oracle Database instance with several options, including mounting and opening a database.

Terms

FORCE

Shuts down the current Oracle Database instance (if it is running) with SHUTDOWN mode ABORT, before restarting it. If the current instance is running and FORCE is not specified, an error results. FORCE is useful while debugging and under abnormal circumstances. It should not normally be used.

RESTRICT

Only enables Oracle Database users with the RESTRICTED SESSION system privilege to connect to the database. Later, you can use the ALTER SYSTEM command to disable the restricted session feature.

PFILE=*filename*

Causes the specified parameter file to be used while starting up the instance. If PFILE is not specified, then the default STARTUP parameter file is used. The default file used is platform specific. For example, the default file is \$ORACLE_HOME/dbs/init\$ORACLE_SID.ora on UNIX, and %ORACLE_HOME%\database\initORCL.ora on Windows.

QUIET

Suppresses the display of System Global Area information for the starting instance.

MOUNT *dbname*

Mounts a database but does not open it.

dbname is the name of the database to mount or open. If no database name is specified, the database name is taken from the initialization parameter DB_NAME.

OPEN

Mounts and opens the specified database.

NOMOUNT

Causes the database not to be mounted upon instance startup.

Cannot be used with MOUNT, or OPEN.

RECOVER

Specifies that media recovery should be performed, if necessary, before starting the instance. `STARTUP RECOVER` has the same effect as issuing the `RECOVER DATABASE` command and starting an instance. Only complete recovery is possible with the `RECOVER` option.

Recovery proceeds, if necessary, as if `AUTORECOVERY` is set to `ON`, regardless of whether or not `AUTORECOVERY` is enabled. If a redo log file is not found in the expected location, recovery continues as if `AUTORECOVERY` is disabled, by prompting you with the suggested location and name of the subsequent log files that need to be applied.

UPGRADE

Starts the database in `OPEN UPGRADE` mode and sets system initialization parameters to specific values required to enable database upgrade scripts to be run. `UPGRADE` should only be used when a database is first started with a new version of the Oracle Database Server.

See the *Oracle Database Upgrade Guide* for details about preparing for, testing and implementing a database version upgrade.

When run, upgrade scripts transform an installed version or release of an Oracle database into a later version, for example, to upgrade an Oracle9i database to Oracle Database 10g. Once the upgrade completes, the database should be shut down and restarted normally.

DOWNGRADE

Starts the database in `OPEN DOWNGRADE` mode and sets system initialization parameters to specific values required to enable database downgrade scripts to be run.

See the *Oracle Database Upgrade Guide* for details about preparing for, testing and implementing a database version downgrade.

When run, downgrade scripts transform an installed version or release of Oracle Database into a previous version, for example, to downgrade an Oracle10g database to an Oracle9i database. Once the downgrade completes, the database should be shut down and restarted normally.

Usage

You must be connected to a database as `SYSOPER`, or `SYSDBA`. You cannot be connected to a shared server via a dispatcher.

`STARTUP` with no arguments is equivalent to `STARTUP OPEN`.

`STARTUP OPEN RECOVER` mounts and opens the database even when recovery fails.

Examples

To start an instance using the standard parameter file, mount the default database, and open the database, enter

```
STARTUP
```

or enter

```
STARTUP OPEN database
```

To start an instance using the standard parameter file, mount the default database, and open the database, enter

```
STARTUP FORCE RESTRICT MOUNT
```

To start an instance using the parameter file TESTPARM without mounting the database, enter

```
STARTUP PFILE=testparm NOMOUNT
```

To shutdown a particular database, immediately restart and open it, allow access only to users with the RESTRICTED SESSION privilege, and use the parameter file MYINIT.ORA. enter

```
STARTUP FORCE RESTRICT PFILE=myinit.ora OPEN database
```

To startup an instance and mount but not open a database, enter

```
CONNECT / as SYSDBA
```

```
Connected to an idle instance.
```

```
STARTUP MOUNT
```

```
ORACLE instance started.
```

Total System Global Area	7629732 bytes
Fixed Size	60324 bytes
Variable Size	6627328 bytes
Database Buffers	409600 bytes
Redo Buffers	532480 bytes

STORE

STORE is not available in *iSQL*Plus*.

Syntax

```
STORE SET file_name[.ext] [ CRE[ATE] | REP[LACE] | APP[END]]
```

Saves attributes of the current SQL*Plus environment in a script.

Terms

See [SAVE](#) on page 12-88 for information on the other terms and clauses in the STORE command syntax.

SET

Saves the values of the system variables.

Usage

This command creates a script which can be executed with the [START](#) command on page 12-167, the [@ \("at" sign\)](#) command on page 12-5 or the [@@ \(double "at" sign\)](#) command on page 12-7.

If you want to store a file under a name identical to a STORE command clause (that is, CREATE, REPLACE or APPEND), you must put the name in single quotes or specify a file extension.

Examples

To store the current SQL*Plus system variables in a file named DEFAULTENV with the default command-file extension, enter

```
STORE SET DEFAULTENV
```

To append the current SQL*Plus system variables to an existing file called DEFAULTENV with the extension OLD, enter

```
STORE SET DEFAULTENV.OLD APPEND
```

TIMING

Syntax

```
TIMI[NG] [START text | SHOW | STOP]
```

Records timing data for an elapsed period of time, lists the current timer's name and timing data, or lists the number of active timers.

Terms

START *text*

Sets up a timer and makes *text* the name of the timer. You can have more than one active timer by STARTing additional timers before STOPping the first; SQL*Plus nests each new timer within the preceding one. The timer most recently STARTed becomes the current timer.

SHOW

Lists the current timer's name and timing data.

STOP

Lists the current timer's name and timing data, then deletes the timer. If any other timers are active, the next most recently STARTed timer becomes the current timer.

Enter TIMING with no clauses to list the number of active timers. For other information about TIMING, see SET AUTOTRACE

Usage

You can use this data to do a performance analysis on any commands or blocks run during the period.

See the SET TIMING command for information on automatically displaying timing data after each SQL command or PL/SQL block you run.

To delete all timers, use the CLEAR TIMING command.

Examples

To create a timer named SQL_TIMER, enter

```
TIMING START SQL_TIMER
```

To list the current timer's title and accumulated time, enter

```
TIMING SHOW
```

To list the current timer's title and accumulated time and to remove the timer, enter

```
TIMING STOP
```

TTITLE

Syntax

TTI[TLE] [*printspec* [*text* | *variable*] ...] [ON | OFF]

where *printspec* represents one or more of the following clauses used to place and format the text:

BOLD

CE[NTER]

COL *n*

FORMAT *text*

LE[FT]

R[IGHT]

S[KIP] [*n*]

TAB *n*

Places and formats a specified title at the top of each report page. Enter TTITLE with no clauses to list its current definition. The old form of TTITLE is used if only a single word or string in quotes follows the TTITLE command.

See [TTI\[TLE\] text \(obsolete old form\)](#) on page C-4 for a description of the old form of TTITLE.

Terms

These terms and clauses also apply to the BTITLE command.

text

The title text. Enter text in single quotes if you want to place more than one word on a single line.

variable

A substitution variable or any of the following system-maintained values, SQL.LNO (the current line number), SQL.PNO (the current page number), SQL.RELEASE (the current Oracle Database release number), SQL.SQLCODE (the current error code), or SQL.USER (the current username).

To print one of these values, reference the appropriate variable in the title. You can format *variable* with the FORMAT clause.

SQL*Plus substitution variables (& variables) are expanded before TTITLE is executed. The resulting string is stored as the TTITLE text. During subsequent execution for each page of results, the expanded value of a variable may itself be interpreted as a substitution variable with unexpected results.

You can avoid this double substitution in a TTITLE command by not using the & prefix for variables that are to be substituted on each page of results. If you want to use a substitution variable to insert unchanging text in a TTITLE, enclose it in quotes so that it is only substituted once.

OFF

Turns the title off (suppresses its display) without affecting its definition.

ON

Turns the title on (restores its display). When you define a top title, SQL*Plus automatically sets TTITLE to ON.

COL *n*

Indents to column *n* of the current line (backward if column *n* has been passed). Here "column" means print position, not table column.

S[KIP] [*n*]

Skips to the start of a new line *n* times; if you omit *n*, one time; if you enter zero for *n*, backward to the start of the current line.

TAB *n*

Skips forward *n* columns (backward if you enter a negative value for *n*). "Column" in this context means print position, not table column.

LE[FT] | CE[NTER] | R[IGHT]

Left-align, center, and right-align data on the current line respectively. SQL*Plus aligns following data items as a group, up to the end of the *printspec* or the next LEFT, CENTER, RIGHT, or COL command. CENTER and RIGHT use the SET LINESIZE value to calculate the position of the data item that follows.

BOLD

Prints data in bold print. SQL*Plus represents bold print on your terminal by repeating the data on three consecutive lines. On some operating systems, SQL*Plus may instruct your printer to print bold text on three consecutive lines, instead of bold.

FORMAT *text*

Specifies a format model that determines the format of following data items, up to the next FORMAT clause or the end of the command. The format model must be a text constant such as A10 or \$999. See the [COLUMN](#) command on page 12-28 for more information on formatting and valid format models.

If the datatype of the format model does not match the datatype of a given data item, the FORMAT clause has no effect on that item.

If no appropriate FORMAT model precedes a given data item, SQL*Plus prints NUMBER values using the format specified by SET NUMFORMAT or, if you have not used SET NUMFORMAT, the default format. SQL*Plus prints DATE values according to the default format.

Enter TTITLE with no clauses to list the current TTITLE definition.

Usage

If you do not enter a *printspec* clause before the first occurrence of text, TTITLE left justifies the text. SQL*Plus interprets TTITLE in the new form if a valid *printspec* clause (LEFT, SKIP, COL, and so on) immediately follows the command name.

See [COLUMN](#) on page 12-28 for information on printing column and DATE values in the top title.

You can use any number of constants and variables in a *printspec*. SQL*Plus displays them in the order you specify them, positioning and formatting each constant or variable as specified by the *printspec* clauses that precede it.

The length of the title you specify with TTITLE cannot exceed 2400 characters.

The continuation character (a hyphen) will not be recognized inside a single-quoted title text string. To be recognized, the continuation character must appear outside the quotes, as follows:

```
TTITLE CENTER 'Summary Report for' -  
> 'the Month of May'
```

Examples

To define "Monthly Analysis" as the top title and to left-align it, to center the date, to right-align the page number with a three-digit format, and to display "Data in Thousands" in the center of the next line, enter

```
TTITLE LEFT 'Monthly Analysis' CENTER '01 Jan 2003' -  
RIGHT 'Page:' FORMAT 999 SQL.PNO SKIP CENTER -  
'Data in Thousands'
```

Monthly Analysis	01 Jan 2003	Page: 1
	Data in Thousands	

To suppress the top title display without changing its definition, enter

```
TTITLE OFF
```

UNDEFINE

Syntax

UNDEF[INE] *variable* ...

where *variable* represents the name of the substitution variable you want to delete.

Deletes one or more substitution variables that you defined either explicitly (with the DEFINE command) or implicitly (with an argument to the START command).

Examples

To undefine a substitution variable named POS, enter

```
UNDEFINE POS
```

To undefine two substitution variables named MYVAR1 and MYVAR2, enter

```
UNDEFINE MYVAR1 MYVAR2
```

VARIABLE

Syntax

VAR[iable] [*variable* [*type*]]

where *type* represents one of the following:

NUMBER

CHAR

CHAR (*n* [CHAR | BYTE])

NCHAR

NCHAR (*n*)

VARCHAR2 (*n* [CHAR | BYTE])

NVARCHAR2 (*n*)

CLOB

NCLOB

REFCURSOR

BINARY_FLOAT

BINARY_DOUBLE

Declares a bind variable that can be referenced in PL/SQL.

VARIABLE without arguments displays a list of all the variables declared in the session. VARIABLE followed only by a variable name lists that variable.

To free resources used by CLOB and NCLOB bind variables, you may need to manually free temporary LOBs with:

```
EXECUTE DBMS_LOB.FREETEMPORARY (:cv)
```

See [Using Bind Variables](#) on page 5-23 for more information on bind variables. See your *Oracle Database PL/SQL User's Guide and Reference* for more information about PL/SQL.

Terms

variable

Represents the name of the bind variable you wish to create.

NUMBER

Creates a variable of type NUMBER with fixed length.

CHAR

Creates a variable of type CHAR (character) with length one.

CHAR (*n*[CHAR | BYTE])

Creates a variable of type CHAR with length *n* bytes or *n* characters. The maximum that *n* can be is 2000 bytes, and the minimum is 1 byte or 1 character. The maximum *n* for a CHAR variable with character semantics is determined by the number of bytes required to store each character for the chosen character set, with an upper limit of 2000 bytes. The length semantics are determined by the length qualifiers CHAR or

BYTE, and if not explicitly stated, the value of the NLS_LENGTH_SEMANTICS environment variable is applied to the bind variable. Explicitly stating the length semantics at variable definition stage will always take precedence over the NLS_LENGTH_SEMANTICS setting.

NCHAR

Creates a variable of type NCHAR (national character) with length one.

NCHAR (*n*)

Creates a variable of type NCHAR with length *n* characters. The maximum that *n* can be is determined by the number of bytes required to store each character for the chosen national character set, with an upper limit of 2000 bytes. The only exception to this is when a SQL*Plus session is connected to a pre Oracle9i server, or the SQLPLUSCOMPATIBILITY system variable is set to a version less than 9.0.0. In this case the length *n* can be in bytes or characters depending on the chosen national character set, with the upper limit of 2000 bytes still retained.

VARCHAR2 (*n*[CHAR | BYTE])

Creates a variable of type VARCHAR2 with length of up to *n* bytes or *n* characters. The maximum that *n* can be is 4000 bytes, and the minimum is 1 byte or 1 character. The maximum *n* for a VARCHAR2 variable with character semantics is determined by the number of bytes required to store each character for the chosen character set, with an upper limit of 4000 bytes. The length semantics are determined by the length qualifiers CHAR or BYTE, and if not explicitly stated, the value of the NLS_LENGTH_SEMANTICS environment variable is applied to the bind variable. Explicitly stating the length semantics at variable definition stage will always take precedence over the NLS_LENGTH_SEMANTICS setting.

NVARCHAR2 (*n*)

Creates a variable of type NVARCHAR2 with length of up to *n* characters. The maximum that *n* can be is determined by the number of bytes required to store each character for the chosen national character set, with an upper limit of 4000 bytes. The only exception to this is when a SQL*Plus session is connected to a pre Oracle9i server, or the SQLPLUSCOMPATIBILITY system variable is set to a version less than 9.0.0. In this case the length *n* can be in bytes or characters depending on the chosen national character set, with the upper limit of 4000 bytes still retained.

CLOB

Creates a variable of type CLOB.

NCLOB

Creates a variable of type NCLOB.

REFCURSOR

Creates a variable of type REF CURSOR.

BINARY_FLOAT

Creates a variable of type BINARY_FLOAT. BINARY_FLOAT is a floating-point number that conforms substantially with the Institute for Electrical and Electronics Engineers (IEEE) Standard for Binary Floating-Point Arithmetic, IEEE Standard 754-1985.

BINARY_DOUBLE

Creates a variable of type BINARY_DOUBLE. BINARY_DOUBLE is a floating-point number that conforms substantially with the Institute for Electrical and Electronics

Engineers (IEEE) Standard for Binary Floating-Point Arithmetic, IEEE Standard 754-1985.

Usage

Bind variables may be used as parameters to stored procedures, or may be directly referenced in anonymous PL/SQL blocks.

To display the value of a bind variable created with VARIABLE, use the PRINT command. See [PRINT](#) on page 12-72 for more information.

To automatically display the value of a bind variable created with VARIABLE, use the SET AUTOPRINT command. See [SET AUTOP\[RINT\] {ON | OFF}](#) on page 12-96 for more information.

Bind variables cannot be used in the COPY command or SQL statements, except in PL/SQL blocks. Instead, use substitution variables.

When you execute a VARIABLE ... CLOB or NCLOB command, SQL*Plus associates a LOB locator with the bind variable. The LOB locator is automatically populated when you execute a SELECT clob_column INTO :cv statement in a PL/SQL block. SQL*Plus closes the LOB locator when you exit SQL*Plus.

To free resources used by CLOB and NCLOB bind variables, you may need to manually free temporary LOBs with:

```
EXECUTE DBMS_LOB.FREETEMPORARY (:cv)
```

All temporary LOBs are freed when you exit SQL*Plus.

SQL*Plus SET commands such as SET LONG and SET LONGCHUNKSIZE and SET LOBOFFSET may be used to control the size of the buffer while PRINTing CLOB or NCLOB bind variables.

SQL*Plus REFCURSOR bind variables may be used to reference PL/SQL 2.3 or higher Cursor Variables, allowing PL/SQL output to be formatted by SQL*Plus. For more information on PL/SQL Cursor Variables, see your *Oracle Database PL/SQL User's Guide and Reference*.

When you execute a VARIABLE ... REFCURSOR command, SQL*Plus creates a cursor bind variable. The cursor is automatically opened by an OPEN ... FOR SELECT statement referencing the bind variable in a PL/SQL block. SQL*Plus closes the cursor after completing a PRINT statement for that bind variable, or on exit.

SQL*Plus formatting commands such as BREAK, COLUMN, COMPUTE and SET may be used to format the output from PRINTing a REFCURSOR.

A REFCURSOR bind variable may not be PRINTed more than once without re-executing the PL/SQL OPEN...FOR statement.

Examples

The following example illustrates creating a bind variable, changing its value, and displaying its current value.

To create a bind variable, enter:

```
VARIABLE ret_val NUMBER
```

To change this bind variable in SQL*Plus, you must use a PL/SQL block:

```
BEGIN
  :ret_val:=4;
END;
```

/

```
PL/SQL procedure successfully completed.
```

To display the value of the bind variable in SQL*Plus, enter:

```
PRINT ret_val
```

```
RET_VAL
-----
         4
```

The following example illustrates creating a bind variable and then setting it to the value returned by a function:

```
VARIABLE id NUMBER
BEGIN
  :id := EMP_MANAGEMENT.HIRE
    ('BLAKE', 'MANAGER', 'KING', 2990, 'SALES');
END;
/
```

The value returned by the stored procedure is being placed in the bind variable, :id. It can be displayed with the PRINT command or used in subsequent PL/SQL subprograms.

The following example illustrates automatically displaying a bind variable:

```
SET AUTOPRINT ON
VARIABLE a REFCURSOR
BEGIN
  OPEN :a FOR SELECT LAST_NAME, CITY, DEPARTMENT_ID
    FROM EMP_DETAILS_VIEW
    WHERE SALARY > 12000
    ORDER BY DEPARTMENT_ID;
END;
/
```

```
PL/SQL procedure successfully completed.
LAST_NAME          CITY                DEPARTMENT_ID
-----
Hartstein          Toronto              20
Russell            Oxford              80
Partners           Oxford              80
King               Seattle             90
Kochhar            Seattle             90
De Haan            Seattle             90

6 rows selected.
```

In the above example, there is no need to issue a PRINT command to display the variable.

The following example creates some variables:

```
VARIABLE id NUMBER
VARIABLE txt CHAR (20)
VARIABLE myvar REFCURSOR
```

Enter VARIABLE with no arguments to list the defined variables:

```
VARIABLE
```

```
variable id
datatype NUMBER

variable txt
datatype CHAR(20)

variable myvar
datatype REFCURSOR
```

The following example lists a single variable:

```
VARIABLE txt
```

```
variable txt
datatype CHAR(20)
```

The following example illustrates producing a report listing individual salaries and computing the departmental salary cost for employees who earn more than \$12,000 per month:

```
VARIABLE rc REFCURSOR
BEGIN
  OPEN :rc FOR SELECT DEPARTMENT_NAME, LAST_NAME, SALARY
    FROM EMP_DETAILS_VIEW
    WHERE SALARY > 12000
    ORDER BY DEPARTMENT_NAME, LAST_NAME;
END;
/
```

```
PL/SQL procedure successfully completed.
```

```
SET PAGESIZE 100 FEEDBACK OFF
TTITLE LEFT '*** Departmental Salary Bill ***' SKIP 2
COLUMN SALARY FORMAT $999,990.99 HEADING 'Salary'
COLUMN DEPARTMENT_NAME HEADING 'Department'
COLUMN LAST_NAME HEADING 'Employee'
COMPUTE SUM LABEL 'Subtotal:' OF SALARY ON DEPARTMENT_NAME
COMPUTE SUM LABEL 'Total:' OF SALARY ON REPORT
BREAK ON DEPARTMENT_NAME SKIP 1 ON REPORT SKIP 1
PRINT rc
```

```

*** Departmental Salary Bill ***
DEPARTMENT_NAME          Employee          Salary
-----
Executive                 De Haan          $17,000.00
                        King             $24,000.00
                        Kochhar          $17,000.00
*****
Subtotal:                  $58,000.00

Marketing                 Hartstein        $13,000.00
*****
Subtotal:                  $13,000.00

Sales                     Partners         $13,500.00
                        Russell          $14,000.00
*****
Subtotal:                  $27,500.00

Total:                     $98,500.00

```

The following example illustrates producing a report containing a CLOB column, and then displaying it with the SET LOBOFFSET command.

Assume you have already created a table named `clob_tab` which contains a column named `clob_col` of type CLOB. The `clob_col` contains the following data:

Remember to run the Departmental Salary Bill report each month. This report contains confidential information.

To produce a report listing the data in the `col_clob` column, enter

```

VARIABLE T CLOB
BEGIN
  SELECT CLOB_COL INTO :T FROM CLOB_TAB;
END;
/

```

```

PL/SQL PROCEDURE SUCCESSFULLY COMPLETED

```

To print 200 characters from the column `clob_col`, enter

```

SET LINESIZE 70
SET LONG 200
PRINT T

```

```

T
-----
Remember to run the Departmental Salary Bill report each month This r
eport contains confidential information.

```

To set the printing position to the 21st character, enter

```

SET LOBOFFSET 21
PRINT T

```

T

Departmental Salary Bill report each month This report contains confi
dential information.

For more information on creating CLOB columns, see your *Oracle Database SQL Reference*

WHENEVER OSERROR

Syntax

```
WHENEVER OSERROR {EXIT [SUCCESS | FAILURE | n | variable | :BindVariable]
[COMMIT | ROLLBACK] | CONTINUE [COMMIT | ROLLBACK | NONE]}
```

Performs the specified action (exits SQL*Plus by default) if an operating system error occurs (such as a file writing error).

In *i*SQL*Plus, performs the specified action (stops the current script by default) and returns focus to the Workspace if an operating system error occurs.

Terms

[SUCCESS | FAILURE | *n* | *variable* | :*BindVariable*]

Directs SQL*Plus to perform the specified action as soon as an operating system error is detected. You can also specify that SQL*Plus return a success or failure code, the operating system failure code, or a number or variable of your choice.

EXIT [SUCCESS | FAILURE | *n* | *variable* | :*BindVariable*]

Directs SQL*Plus to exit as soon as an operating system error is detected. You can also specify that SQL*Plus return a success or failure code, the operating system failure code, or a number or variable of your choice. See [EXIT](#) on page 12-61 for more information.

CONTINUE

Turns off the EXIT option.

COMMIT

Directs SQL*Plus to execute a COMMIT before exiting or continuing and save pending changes to the database.

ROLLBACK

Directs SQL*Plus to execute a ROLLBACK before exiting or continuing and abandon pending changes to the database.

NONE

Directs SQL*Plus to take no action before continuing.

Usage

If you do not enter the WHENEVER OSERROR command, the default behavior of SQL*Plus is to continue and take no action when an operating system error occurs.

If you do not enter the WHENEVER SQLERROR command, the default behavior of SQL*Plus is to continue and take no action when a SQL error occurs.

Examples

If a failure occurs when reading from the output file, the commands in the following script cause *i*SQL*Plus to stop processing the current script and return focus to the Input area on the Workspace, or cause SQL*Plus to exit and COMMIT any pending changes:

```
WHENEVER OSERROR EXIT
START no_such_file
```

```
OS Message: No such file or directory
Disconnected from Oracle.....
```

WHENEVER SQLERROR

Syntax

```
WHENEVER SQLERROR {EXIT [SUCCESS | FAILURE | WARNING | n | variable
| :BindVariable] [COMMIT | ROLLBACK] | CONTINUE [COMMIT | ROLLBACK | NONE]}
```

Performs the specified action (exits SQL*Plus by default) if a SQL command or PL/SQL block generates an error.

In *iSQL*Plus*, performs the specified action (stops the current script by default) and returns focus to the Workspace if a SQL command or PL/SQL block generates an error.

Terms

```
[SUCCESS | FAILURE | WARNING | n | variable | :BindVariable]
```

Directs SQL*Plus to perform the specified action as soon as it detects a SQL command or PL/SQL block error (but after printing the error message). SQL*Plus will not exit on a SQL*Plus error.

```
EXIT [SUCCESS | FAILURE | WARNING | n | variable | :BindVariable]
```

Directs SQL*Plus to exit as soon as it detects a SQL command or PL/SQL block error (but after printing the error message). SQL*Plus will not exit on a SQL*Plus error. The EXIT clause of WHENEVER SQLERROR follows the same syntax as the EXIT command. See [EXIT](#) on page 12-61 for more information.

```
CONTINUE
```

Turns off the EXIT option.

```
COMMIT
```

Directs SQL*Plus to execute a COMMIT before exiting or continuing and save pending changes to the database.

```
ROLLBACK
```

Directs SQL*Plus to execute a ROLLBACK before exiting or continuing and abandon pending changes to the database.

```
NONE
```

Directs SQL*Plus to take no action before continuing.

Usage

The WHENEVER SQLERROR command is triggered by SQL command or PL/SQL block errors, and not by SQL*Plus command errors.

Examples

The commands in the following script cause *iSQL*Plus* to stop processing the current script and return focus to the Input area on the Workspace if the SQL UPDATE command fails:

The commands in the following script cause SQL*Plus to exit and return the SQL error code if the SQL UPDATE command fails:

```
WHENEVER SQLERROR EXIT SQL.SQLCODE
UPDATE EMP_DETAILS_VIEW SET SALARY = SALARY*1.1;
```

The following SQL command error causes *iSQL*Plus* to stop processing the current script and return focus to the Input area on the Workspace if the SELECT command fails:

```
WHENEVER SQLERROR EXIT SQL.SQLCODE
select column_does_not_exist from dual;
```

```
select column_does_not_exist from dual
*
ERROR at line 1:
ORA-00904: invalid column name

Disconnected from Oracle.....
```

The following examples show that the `WHENEVER SQLERROR` command is not executed after errors with *SQL*Plus* commands, but it is executed if SQL commands or PL/SQL blocks cause errors:

```
WHENEVER SQLERROR EXIT SQL.SQLCODE
column LAST_name heading "Employee Name"
```

```
Unknown COLUMN option "heading"

SHOW non_existed_option
```

The following PL/SQL block error causes *SQL*Plus* to exit and return the SQL error code:

```
WHENEVER SQLERROR EXIT SQL.SQLCODE
begin
    SELECT COLUMN_DOES_NOT_EXIST FROM DUAL;
END;
/
```

```
SELECT COLUMN_DOES_NOT_EXIST FROM DUAL;
*
ERROR at line 2:
ORA-06550: line 2, column 10:
PLS-00201: identifier 'COLUMN_DOES_NOT_EXIST' must be declared
ORA-06550: line 2, column 3:
PL/SQL: SQL Statement ignored

Disconnected from Oracle.....
```

XQUERY

Syntax

XQUERY *xquery_statement*

The SQL*Plus XQUERY command enables you to perform an XQuery 1.0 query on a specified database. XQUERY is supported on Oracle Database 10g (Release 2) and later versions. Attempting to use XQUERY on an earlier version of the Oracle Database gives the error:

```
SP2-614 Server version too low
```

Terms

xquery_statement

Specifies the XQuery statement you want to run. The statement is entered with standard XQuery syntax. The XQUERY statement is terminated with a forward slash, '/'.

Usage

Prefix your XQuery statement with the SQL*Plus command, XQUERY, and terminate the XQUERY command with a slash (/). XQUERY is a SQL*Plus keyword. If XQueries are executed in other tools, the keyword may not be needed.

XML output from the XQUERY command is displayed as native XML according to the active SET command options. SET LONG typically needs to be set. It may be useful to consider the following settings:

- Linesize for rows longer than the default 80 characters in the Script Formatting page of *iSQL*Plus* Preferences (SET LINESIZE).
- LOB, LONG and XML Type Size for rows longer than the default 80 characters in the Script Execution page of *iSQL*Plus* Preferences (SET LONG).
- Output Page Setup to match output in the Interface Configuration page of *iSQL*Plus* Preferences (SET PAGESIZE).
- Display Headings to repress the "Result Sequence" column heading in the Script Formatting page of *iSQL*Plus* Preferences (SET HEADING OFF).

The XQUERY command requires an active database connection. The command will not work with SQLPLUS /NOLOG.

Bind variables are not supported in the XQUERY command.

The site profile, *glogin.sql*, contains the following COLUMN command to define the column heading for XQuery output:

```
COLUMN column_value HEADING 'Result Sequence'
```

You can change the COLUMN definition to define the heading you want.

There are four *iSQL*Plus* Preferences (SET commands) specific to the XQUERY command. The SHOW XQUERY command gives the status of these settings. They are:

Table 12-5 XQUERY *iSQL*Plus* Preferences (SET commands)

Script Execution <i>iSQL*Plus</i> Preference	Equivalent SET Command
XQuery Base URI	SET XQUERY BASEURI

Table 12-5 (Cont.) XQUERY iSQL*Plus Preferences (SET commands)

Script Execution iSQL*Plus Preference	Equivalent SET Command
XQuery Ordering	SET XQUERY ORDERING
XQUERY Node Identity	SET XQUERY NODE
XQUERY Context	SET XQUERY CONTEXT

For more information about the SET XQUERY commands, see :

- [SET XQUERY BASEURI {text}](#) on page 12-155
- [SET XQUERY ORDERING {UNORDERED | ORDERED | DEFAULT}](#) on page 12-156
- [SET XQUERY NODE {BYVALUE | BYREFERENCE | DEFAULT}](#) on page 12-157
- [SET XQUERY CONTEXT {text}](#) on page 12-158

Examples

The XQuery statement in the following script queries the EMP_DETAILS_VIEW view of the HR schema:

```
set long 160
set linesize 160
xquery for $i in ora:view("EMP_DETAILS_VIEW") return $i
/
```

```
Result Sequence
-----
-----
<ROW><EMPNO>7369</EMPNO><ENAME>SMITH</ENAME><JOB>CLERK</JOB><MGR>7902</MGR><HI
REDATE>17-
DEC-80</HIREDATE><SAL>800</SAL><DEPTNO>20</DEPTNO></ROW>

14 item(s) selected.
```

SQL*Plus Error Messages

This appendix lists error messages with prefixes SP2- and CPY- generated by SQL*Plus and iSQL*Plus:

- [SQL*Plus Error Messages](#)
- [iSQL*Plus Error Messages](#)
- [COPY Command Messages](#)

For error messages with prefixes such as ORA-, TNS- and PLS- generated by Oracle Database, see the *Oracle Database Error Messages* guide.

SQL*Plus Error Messages

SP2-0002 ACCEPT statement must specify a variable name

Cause: Required variable name was missing after the ACCEPT command.

Action: Re-enter the ACCEPT command with a variable argument to store the input value.

SP2-0003 Ill-formed ACCEPT command starting as command_string

Cause: An invalid option was used in the ACCEPT command.

Action: Check the syntax of the ACCEPT command for the correct option.

SP2-0004 Nothing to append

Cause: There was no specified text entered after the APPEND command.

Action: Re-enter the APPEND command with the specified text.

SP2-0006 not enough room to format computations

Cause: Unable to allocate memory to format computations.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0015 no break(s) defined

Cause: There was no break defined.

Action: Define a break. Check the syntax of the BREAK command for the correct options.

SP2-0016 break specification must start with ON/BY or ACROSS keyword

Cause: An invalid option was used in the BREAK command.

Action: Check the syntax of the BREAK command for the correct options.

SP2-0017 missing column name after keyword_name keyword

Cause: There was no column name after the specified keyword.

Action: Enter a column name after the specified keyword.

SP2-0019 invalid numeric argument to option_name option

Cause: An invalid numeric argument was used in the specified option.

Action: Correct the argument and try again.

SP2-0020 no storage available for column_name

Cause: An error has occurred. SQL*Plus was unable to allocate memory for a BREAK command.

Action: Allocate more memory by closing some applications.

SP2-0022 cannot allocate space to modify the buffer_name buffer variable

Cause: An internal error occurred.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0023 String not found

Cause: The search string specified was not found.

Action: Check the search string to make sure that it is valid.

SP2-0024 Nothing to change

Cause: There was nothing in the SQL buffer when using the CHANGE command.

Action: Make sure the SQL buffer is not empty before using the CHANGE command.

SP2-0025 Invalid change string

Cause: An invalid option was used in the CHANGE command.

Action: Check the syntax of the CHANGE command for the correct options.

SP2-0026 No lines to delete

Cause: There was nothing in the SQL buffer when using the DEL command.

Action: Make sure the SQL buffer is not empty before using the DEL command.

SP2-0027 Input is too long (> max_characters characters) - line ignored

Cause: The input value specified was too long.

Action: Re-enter with fewer characters.

SP2-0029 command buffer space exhausted

Cause: A large SQL or PL/SQL script is being executed from SQL*Plus.

Action: Reduce the size of the SQL statement or PL/SQL block by one of the following:

- Remove extra white space and comments.
- Re-code to use fewer commands and/or shorter variable names.
- Place sections of the block into stored (or packaged) procedures, and then call these procedures from the block.

SP2-0030 no room for another line

Cause: The maximum number of lines in a SQL statement or PL/SQL block has been exceeded.

Action: Reduce the number of lines and try again.

SP2-0038 Command too long. (max_characters characters)

Cause: The specified command entered was too long.

Action: Check the command syntax for the limitation.

SP2-0039 command-line overflow while substituting into command_name

Cause: The maximum length of the command line has been exceeded.

Action: Reduce the length of the data in the substitution variables used in the command.

SP2-0042 unknown command command_name - rest of line ignored

Cause: The command entered was not valid.

Action: Check the syntax of the command you used for the correct options.

SP2-0044 For a list of known commands enter HELP and to leave enter EXIT

Cause: An unknown command was entered.

Action: Check the syntax of the command you used for the correct options.

SP2-0045 no column_name defined

Cause: No columns have been defined.

Action: No action required.

SP2-0046 column_name not defined

Cause: The column name specified was not defined.

Action: Retry with a valid column name.

SP2-0047 Invalid number for option_name option

Cause: An invalid number was used for this option.

Action: Re-try the operation with a valid number.

SP2-0052 like column_name, column_name not defined

Cause: The column which the format is based on was not defined.

Action: Use the COLUMN command to make sure the column the format is based on is defined first.

SP2-0054 no room to allocate definition_name definition. Ignored

Cause: Unable to allocate memory to process the COLUMN command.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

**SP2-0055 out of room while allocating portion of new definition_name.
Old definition (if any) retained**

Cause: Unable to allocate memory to store the new definition.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0080 no COMPUTES currently defined

Cause: No COMPUTE definition.

Action: Define a COMPUTE. Check the syntax of the COMPUTE command for the correct options.

SP2-0081 maximum of number COMPUTE functions allowed at a time

Cause: The maximum number of COMPUTE functions has been exceeded.

Action: Reduce the number of COMPUTE functions.

SP2-0082 no COMPUTE functions requested

Cause: No COMPUTE functions requested.

Action: No action required.

SP2-0083 warning: COMPUTE option function_name specified number times

Cause: A label or a function was specified more than once.

Action: Remove the unnecessary labels or functions.

SP2-0084 COMPUTE ON keyword specified already

Cause: The ON keyword was specified more than once.

Action: Specify the ON keyword once in the command.

SP2-0085 COMPUTE OF keyword specified already

Cause: The OF keyword was specified more than once.

Action: Specify the OF keyword once in the command.

SP2-0087 no room to allocate COMPUTE control block for column_name

Cause: Unable to allocate memory to process the COMPUTE command.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0088 missing keyword_name keyword.

Usage: STORE {SET} filename[.ext] [CRE[ATE] | REP[LACE] | APP[END]]

Cause: Missing a keyword in the statement.

Action: Check the syntax of the command you used for the correct options, and use the keyword in the appropriate place.

SP2-0092 missing columns for keyword_name keyword

Cause: The column name was not specified for the keyword.

Action: Specify the column name and try again.

SP2-0096 no more room to allocate INTO variable variable_name

Cause: Unable to allocate memory to process the COMPUTE command.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0097 no storage to allocate ON column column_name

Cause: Unable to allocate memory to process the COMPUTE command.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0098 no storage to allocate COMPUTE block for column_name

Cause: Unable to allocate memory to process the COMPUTE command.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0103 Nothing in SQL buffer to run

Cause: Nothing was in the SQL buffer to run.

Action: Enter a valid SQL command. SQL*Plus commands are not stored in the SQL buffer.

SP2-0105 Illegal, or missing, entity name

Cause: File name was not specified in the GET or SAVE commands.

Action: Specify a file name and try again.

SP2-0107 Nothing to save

Cause: Nothing in the SQL buffer when attempting to save the content to a file.

Action: Enter a SQL command to save. SQL*Plus commands are not stored in the SQL buffer.

SP2-0108 The filenames CREATE, REPLACE, APPEND, FILE and abbreviations may not be used

Cause: An attempt was made to enter a filename using the word FILE, or one of the command keywords CREATE, REPLACE, APPEND, or one of their abbreviations. The filename specified in the command was not permitted.

Action: Check the following command syntax and enter a valid filename:

```
command filename[.ext] [CR[EATE]|REP[LACE]|AP[PEND]]
```

where *command* can be SAVE, SPOOL or STORE SET

To use the command keywords CREATE, REPLACE, APPEND or one of their abbreviations as the filename, or to use the word FILE as the filename, you must enclose it in single quotes.

SP2-0109 Cannot append to file file_name

Cause: An attempt was made to append the content of the SQL buffer to a file and the file could not be written. Possible causes:

- An error was encountered when creating the destination file.
- A directory name specified in the SAVE statement was not found.
- A system error made it impossible to open the file.

Action: Take the following actions:

- Check that the destination is valid and that there is sufficient space on the destination device.
- Check the statement for a typing mistake in the directory name. Then issue the statement again after correcting the directory name.

SP2-0110 Cannot create save file file_name

Cause: An attempt was made to save the content of the SQL buffer to a file and the file could not be written. Possible causes:

- An error was encountered when creating the destination file.

- A directory name specified in the SAVE statement was not found.
- A system error made it impossible to open the file.

Action: Take the following actions:

- Check that the destination is valid and that there is sufficient space on the destination device.
- Check the statement for a typing mistake in the directory name. Then issue the statement again after correcting the directory name.

SP2-0111 Cannot close save file file_name

Cause: The file was in use.

Action: Release the file from the other process.

SP2-0116 Illegal SAVE command

Cause: An invalid option was used in the SAVE command.

Action: Check the syntax of the SAVE command for the correct options.

SP2-0134 no symbols currently defined

Cause: No DEFINE symbols were defined.

Action: No action required.

SP2-0135 Symbol symbol_name is UNDEFINED

Cause: The specified symbol was undefined.

Action: Re-enter the DEFINE command with an assignment clause or a valid symbol or variable name.

SP2-0136 DEFINE requires an equal sign (=)

Cause: Expecting an equal sign after a symbol or variable name in the DEFINE command.

Action: Specify an equal sign after the symbol or variable name.

SP2-0137 DEFINE requires a value following equal sign

Cause: There was no value for the variable or symbol. SQL*Plus expected a value to be assigned to a symbol or variable name after the equal sign.

Action: Specify a value for the symbol or variable.

SP2-0138 no room to add substitution variable variable

Cause: Maximum number of variables that can be defined in a SQL*Plus session was exceeded.

Action: UNDEFINE any unused variables to make room for this variable and re-run the command.

SP2-0146 Unable to allocate dynamic space needed (number_of_bytes bytes) - exiting

Cause: An internal error occurred.

Action: Note the message and number, and contact the System Administrator.

SP2-0152 ORACLE may not be functioning properly

Cause: Unable to initialize a session to the Oracle instance.

Action: Make a note of the message and the number, then contact the Database Administrator.

SP2-0157 unable to CONNECT to ORACLE after 3 attempts, exiting SQL*Plus

Cause: Unable to connect to Oracle after three attempts.

Action: Validate login details and re-try.

SP2-0158 unknown command_option option "option_name"

Cause: An invalid option was specified for the given command.

Action: Check the syntax of the command you used for the correct options.

SP2-0160 Unable to open file_name

Cause: Possible causes:

- The file was not found under the specified name in the specified location.
- File lacked the necessary privileges to open the file.
- A system error made it impossible to open the file.

Action: Take the following actions:

- Make sure the file name specified is stored in the appropriate directory.
- Make sure that the file has the privileges necessary for access. If it does not then change privileges accordingly.
- Consult operating system documentation or contact the System Administrator.

SP2-0161 line line_number truncated

Cause: The line in the file was too long.

Action: No action required or reduce the length of the line.

SP2-0162 unable to close file_name

Cause: Unable to close the specified file as it was being used.

Action: Release the file from the other process.

SP2-0171 HELP system not available

Cause: Command-line SQL*Plus help is not installed in this Oracle instance.

Action: Command-line SQL*Plus help is not installed in this Oracle instance. Use the sqlplus/admin/help/hlpbld.sql script to install HELP on this database:

```
sqlplus system @hlpbld.sql helpus.sql
```

SP2-0172 No HELP matching this topic was found.

Cause: There is no help information available for the specified command.

Action: Enter HELP INDEX for a list of topics.

SP2-0176 Option ? Is invalid

Cause: The option ? is not valid in this command.

Action: Check the syntax of the command you used for the correct options.

SP2-0187 error in variable assignment

Cause: The assignment for the specified variable was incorrect.

Action: Check the syntax of the ACCEPT command for the correct options.

SP2-0223 No lines in buffer_name buffer

Cause: There are no lines stored in the buffer.

Action: Enter SQL statements into the buffer.

SP2-0224 invalid starting line number

Cause: The line number specified was incorrect.

Action: Check that the line number is correct and try again.

SP2-0225 invalid ending line number

Cause: The line number specified was incorrect.

Action: Check that the line number is correct and try again.

SP2-0226 Invalid line number current_line_number

Cause: Invalid line number was specified.

Action: Re-enter with a valid line number.

SP2-0232 Input too long. Must be less than number_of_characters characters

Cause: The input value was too long.

Action: Reduce the size of the value and re-enter.

SP2-0233 Unable to obtain userid after number_of_attempts attempts. Retry command

Cause: SQL*Plus was unable to login after three attempts.

Action: Make sure the userid and password is correct and try again.

SP2-0240 Enter value for variable_name:

Cause: SQL*Plus was unable to find a value for a substitution variable.

Action: Enter a value for the substitution variable at the prompt.

SP2-0241 No room for symbol symbol_name (not defined)

Cause: Unable to allocate memory for the symbol.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0244 Cannot issue a PRINT command within a PAGE break

Cause: The PRINT command is not allowed within a PAGE break.

Action: Check the syntax of the PRINT command for the correct options.

SP2-0245 Unable to allocate temporary storage for printing

Cause: Unable to allocate temporary storage for printing.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0246 Illegal FORMAT string column_format_name

Cause: An invalid format was specified for the column.

Action: Specify a valid format for the column.

SP2-0249 variable_name not a valid variable type for printing

Cause: The specified variable is not valid for printing.

Action: Check the variable type before re-typing the command.

SP2-0253 data item line_number (data_item_name) will not fit on line

Cause: The current line size setting is too small to fit the specified data item on a line.

Action: Increase the line size so that the item can be displayed.

SP2-0258 could not create variable variable_name for column column_name

Cause: The specified variable could not be created for column – internal error or out of memory.

Action: Check memory usage.

SP2-0259 could not create variable variable_name for COMPUTE INTO

Cause: The specified variable could not be created.

Action: Check the syntax of the command you used for the correct options.

SP2-0260 computation for column column_name not uniquely qualified. could be for table table_name or table_name. computation ignored.

Cause: The specified column was not uniquely qualified in the statement.

Action: Check the syntax of the command you used for the correct options.

SP2-0262 no room to allocate CCBDEF pointer array

Cause: An internal memory error occurred.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0263 no room to allocate COMPUTE block for column_name ON page/report/column_name

Cause: Insufficient memory allocated to the COMPUTE block.

Action: Allocate more memory by closing other applications.

SP2-0265 option_name must be set ON or OFF

Cause: An invalid SET option name was specified.

Action: Re-enter with either ON or OFF as one of the SET options.

SP2-0266 internal error: buffer (buffer_size) smaller than 1 (buffer_limit)

Cause: An internal error occurred.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0267 option_name option parameter_number out of range (lower_range through upper_range)

Cause: A value for a parameter was out of the specified range.

Action: Check the limits of the parameter and enter a value that is within the range.

SP2-0268 option_name option not a valid number

Cause: Non-numeric value (integer) was entered for a parameter.

Action: Enter a valid numeric value (integer).

SP2-0271 variable_name is not a buffer variable

Cause: The specified variable was not defined as a buffer.

Action: Make sure that the buffer variable name is correct and try again.

SP2-0272 character_name character cannot be alphanumeric or white-space

Cause: The specified character in the SET command cannot be alphanumeric or white-space.

Action: Check the syntax of the command you used for the correct options.

SP2-0277 entered_value value not valid

Cause: The value entered was incorrect.

Action: Re-enter with a valid value.

SP2-0281 option_name missing set option

Usage: SET SHIFT[INOUT] [VIS[IBLE | INV[ISIBLE]]

or

Usage: SET MARKUP HTML [ON | OFF] [HEAD text] [BODY text] [TABLE text] [ENTMAP [ON | OFF]] [SPOOL [ON | OFF]] [PRE[FORMAT] [ON | OFF]] [-M[ARKUP] \ "HTML [ON | OFF] [HEAD text] [BODY text]

Cause: SET option was missing in the command.

Action: Check the syntax of the command you used for the correct options.

SP2-0306 Invalid option

Usage: CONN[ECT] [login] [AS {SYSDBA | SYSOPER}]

Where <login> ::= <username>[/<password>][@<connect_string>] | /

or

Usage: CONN[ECT] username/password[@connect_identifier] [AS {SYSOPER | SYSDBA}]or: CONN[ECT] /[@connect_identifier] AS {SYSOPER | SYSDBA}

Cause: Invalid option was specified for the command.

Action: Check the syntax of the command you used for the correct options.

SP2-0308 cannot close spool file

Cause: The file is currently being used.

Action: Release the file from the other process.

SP2-0309 SQL*Plus command procedures may only be nested to a depth of number_of_nested_procedures

Cause: Maximum number of nested procedures or scripts was reached.

Action: Reduce the number of nested procedures or scripts.

SP2-0310 unable to open file file_name

Cause: Unable to open the specified file.

Action: Check and make sure the file name is valid.

SP2-0311 string expected but not found

Cause: SQL*Plus was expecting a string at the end of the command, but could not find it.

Action: Retry the command with a valid string. Check the syntax of the command you used for the correct options.

SP2-0312 missing terminating quote (quote_type)

Cause: The DESCRIBE command schema or object did not have a terminating quote.

Action: Close the opening quotation mark with the corresponding closing quotation mark.

SP2-0317 expected symbol name is missing

Cause: SQL*Plus was expecting a symbol, but it was not specified.

Action: Check the syntax of the command you used for the correct options.

SP2-0318 symbol name beginning variable_name.. is too long (max max_name_length) Illegal variable name variable_name

Cause: Specified variable name exceeded the maximum name length.

Action: Reduce the size of the symbol name and re-enter.

SP2-0323 no room to add timing element - request denied

Cause: Unable to allocate memory while trying to run the TIMING command.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0324 operating system timing error error_option_number - request denied

Cause: The TIMING command failed to initialize due to a possible operating system error.

Action: Resolve the operating system error and try again.

SP2-0325 no timing elements to option_name

Cause: There are no timers recorded to SHOW or STOP.

Action: Check that timers were created with the TIMING command.

SP2-0328 no room to allocate title buffer

Cause: Unable to allocate memory while trying to run the TTITLE or BTITLE command.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0331 SPOOL OUT disabled

Cause: An attempt was made to use SPOOL OUT where it is not supported.

Action: No action possible. SPOOL OUT has been disabled possibly because of lack of printing support at the operating system level.

SP2-0332 Cannot create spool file

Cause: Possible causes:

- Insufficient privileges to create a file.
- A system error made it impossible to create a file.

Action: Take the following actions:

- Change privileges to allow creation of the file.
- Consult the operating system documentation or contact the System Administrator.

SP2-0333 Illegal spool file name: spool_name (bad character: 'character_name')

Cause: An invalid filename was entered in the SPOOL command.

Action: Correct the filename and re-enter.

SP2-0341 line overflow during variable substitution (>number_of_characters characters at line line_number)

Cause: The maximum number of characters was exceeded in the SQL buffer after the substitution variable was expanded.

Action: Reduce the length in the substitution variable and try again.

SP2-0357 Out of temporary storage

Cause: Unable to allocate memory while trying to run the command.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0359 memory exhausted

Cause: Unable to allocate memory while trying to run the command.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0381 command_name is not available

Cause: The command specified is not implemented.

Action: Use the appropriate SQL*Plus command. See the documentation for a list of commands and their correct syntax.

SP2-0382 The command_name command is not available

Cause: The command was not recognized, or it is disabled. This occurs if it is a command that does not have any meaning in SQL*Plus (such as a SQL buffer editing command), or it is not allowed for security reasons.

Action: Remove the command from the script. See the documentation for a list of commands and their correct syntax.

SP2-0392 Cannot UNDEFINE the current edit buffer

Cause: The current edit buffer cannot be undefined.

Action: No action required.

SP2-0394 Illegal buffer name: buffer_name

Cause: A buffer name contained an illegal character, for example hyphen (-).

Action: Correct and remove the illegal character from the buffer name.

SP2-0423 Illegal GET command

Cause: An invalid option was used in the GET command.

Action: Check the syntax of the command you used for the correct options.

SP2-0425 value is not a valid datatype

Cause: The value entered in the ACCEPT command was not valid for the specified datatype.

Action: Enter a valid value, e.g. 123 for a NUMBER variable.

SP2-0426 Input truncated to number_of_characters characters

Cause: There was no carriage return at the last line of the SQL statement.

Action: Insert a carriage return.

SP2-0495 FROM and TO clauses both missing; specify at least one

Cause: The FROM and TO clauses were missing from the COPY statement.

Action: Specify at least one clause. Check the syntax of the command you used for the correct options.

SP2-0496 Misplaced FROM clause

Cause: The FROM keyword was in the wrong position in the COPY command.

Action: Check the syntax of the COPY command for the correct options.

SP2-0497 Misplaced TO clause

Cause: The TO keyword was in the wrong position in the COPY command.

Action: Check the syntax of the COPY command for the correct options.

SP2-0498 Missing parenthetical column list or USING keyword

Cause: A parenthetical list was missing in the column list or the USING keyword is missing in the COPY command.

Action: Check the syntax of the COPY command for the correct options.

SP2-0499 Misplaced APPEND keyword

Cause: The APPEND keyword was in the wrong position in the COPY command.

Action: Check the syntax of the COPY command for the correct options.

SP2-0501 Error in SELECT statement: Oracle_database_error_message

Cause: Invalid SELECT statement found in the COPY command.

Action: Check the syntax of the COPY command for the correct options.

SP2-0513 Misplaced CREATE keyword

Cause: The CREATE keyword was in the wrong position in the COPY command.

Action: Check the syntax of the COPY command for the correct options.

SP2-0514 Misplaced REPLACE keyword

Cause: The REPLACE keyword was in the wrong position in the COPY command.

Action: Check the syntax of the COPY command for the correct options.

SP2-0515 Maximum number of columns (max_num_columns) exceeded

Cause: The maximum number of columns was exceeded in the COPY command.

Action: Reduce the number of columns and try again.

SP2-0516 Invalid command_name name NULL encountered

Cause: An invalid or null column name was specified in either the COLUMN or the ATTRIBUTE command.

Action: Retry the operation with a valid column name.

SP2-0517 Missing comma or right parenthesis

Cause: A missing right parenthesis was identified in the COPY command.

Action: Retry the operation with a comma or right parenthesis.

SP2-0518 Missing USING clause

Cause: USING keyword is missing in the USING clause of the COPY command.

Action: Specify the USING keyword before the USING clause of the COPY command.

SP2-0519 FROM string missing Oracle Net @database specification

Cause: Missing connect string for the database that contains the data to be copied from in the COPY command.

Action: Include a FROM clause to specify a source database other than the default.

SP2-0520 TO string missing Oracle Net @database specification

Cause: Missing connect string for the database containing the destination table in the COPY command.

Action: Include a TO clause to specify a source database other than the default.

SP2-0526 Misplaced INSERT keyword

Cause: The INSERT keyword was misplaced in the COPY command.

Action: Check the syntax of the COPY command for the correct options.

SP2-0540 File file_name already exists. Use SAVE filename[.ext] REPLACE

Cause: The file specified already exists.

Action: Use the REPLACE option to overwrite the existing file, or specify another file name.

SP2-0544 Command command_name disabled in Product User Profile

Cause: An attempt was made to use a command that has been explicitly disabled for your schema in this database.

Action: Ask your System Administrator why the Product User Profile (PUP) table has been set to disable this command for your schema.

SP2-0545 SET command requires an argument

Cause: An argument was missing in the SET command.

Action: Check the syntax of the SET command for the correct options.

SP2-0546 User requested Interrupt or EOF detected

Cause: Either end-of-file was reached, or CTRL-C was entered to cancel the process.

Action: No action required.

SP2-0547 option_name option value out of range (lower_value through upper_value)

Cause: The specified SET option was out of range.

Action: Enter a value within the SET option range and re-try the SET command.

SP2-0548 Usage: VAR[IABLE] [<variable> [NUMBER | CHAR | CHAR (n [CHAR|BYTE]) | VARCHAR2 (n [CHAR|BYTE]) | NCHAR | NCHAR (n) | NVARCHAR2 (n) | CLOB | NCLOB | REFCURSOR | BINARY_FLOAT | BINARY_DOUBLE]]

Cause: Incorrect syntax for the VARIABLE command was entered.

Action: Check the syntax of the VARIABLE command for the correct usage.

SP2-0549 Usage: PRINT [:<variable> ...]

Cause: Incorrect syntax for the PRINT command was entered.

Action: Check the syntax of the PRINT command for the correct usage.

SP2-0550 Usage: SHOW ERRORS [(FUNCTION | PROCEDURE | PACKAGE | PACKAGE BODY | TRIGGER | VIEW | TYPE | TYPE BODY | DIMENSION | JAVA SOURCE | JAVA CLASS) [schema.]name]

Cause: Incorrect syntax for the SHOW ERRORS command was entered.

Action: Check the syntax of the SHOW ERRORS command for the correct options.

SP2-0552 Bind variable variable_name not declared

Cause: The specified bind variable was not declared.

Action: Run the VARIABLE command to check that the bind variables you used in your SQL statement exist. Before running a SQL statement with bind variables, you must use the VARIABLE command to declare each variable.

SP2-0556 Invalid file name

Usage: STORE {SET} filename.ext] [CRE[ATE] | REP[LACE] | APP[END]]

or

Unable to complete EDIT command

Cause: Missing file name or an invalid file name specified.

Action: Make sure that a file name was specified.

SP2-0559 Usage: EXEC[UTE] statement

Cause: Incorrect syntax for the EXECUTE command was entered.

Action: Check the syntax of the EXECUTE command for the correct usage.

SP2-0560 Usage: DESCRIBE [schema.]object[.subobject | @db_link] [column]

Cause: Incorrect syntax for the DESCRIBE command was entered.

Action: Check the syntax of the DESCRIBE command for the correct usage.

SP2-0561 Object does not exist

Cause: The specified object you tried to DESCRIBE does not exist in the database.

Action: Retry the command with a valid object name.

SP2-0562 Object does not exist in package

Cause: The specified object you tried to DESCRIBE does not exist in the package.

Action: Check and make sure that the object name is correct.

SP2-0564 Object object_name is INVALID, it may not be described

Cause: The specified object you tried to DESCRIBE is invalid.

Action: Re-validate the object.

SP2-0565 Illegal identifier

Cause: An invalid character was used in the DESCRIBE command.

Action: Correct the character and try again.

SP2-0566 Illegal sub-object specification

Cause: Invalid sub-object specification in the DESCRIBE command.

Action: Correct the subject specification and try again.

SP2-0567 Illegal column specification for PL/SQL object

Cause: A column was described within an object in the DESCRIBE command.

Action: Remove the column specification in the DESCRIBE command and try again.

SP2-0568 No bind variables declared

Cause: There are no bind variables declared.

Action: No action required.

SP2-0570 Usage: SET SERVEROUTPUT {ON | OFF} [SIZE {n | UNL[IMITED]}] [FOR[MAT] {WRA[PPED] | WOR[D_WRAPPED] | TRU[NCATED]}]

Cause: An invalid option was used in the SET SERVEROUTPUT command.

Action: Specify a valid option.

SP2-0575 Use of Oracle SQL feature not in SQL92 Entry | Intermediate | Full Level

Cause: A SQL statement was attempted that is not FIPS compliant. May also occur if a SQL*Plus feature, for example SET AUTOTRACE, that uses Oracle-specific SQL was turned on when you are using FIPS flagging.

Action: Use SET FLAGGER, and turn FIPS compliance checking OFF, or rewrite the statement.

SP2-0577 Usage: SET FLAGGER {OFF | ENTRY | INTERMEDIATE | FULL}

Cause: An invalid option was specified in the SET FLAGGER command.

Action: Specify a valid option.

SP2-0581 Object object_name is a package; use 'DESCRIBE <package>.<procedure>'

Cause: A attempt was made to describe a package as stand-alone, no sub-object such as a procedure was supplied.

Action: Use the DESCRIBE command to describe a sub-object within a package.

SP2-0582 Usage: {EXIT | QUIT} [SUCCESS | FAILURE | WARNING | n | <variable> | :<bindvariable>] [COMMIT | ROLLBACK]

Cause: An option to EXIT was invalid in SQL*Plus.

Action: Specify a valid option.

SP2-0584 EXIT variable variable_name was non-numeric

Cause: The specified EXIT variable is non-numeric.

Action: Check the syntax of the EXIT command for the correct usage.

SP2-0590 A COMPUTE function must appear before each LABEL keyword

Cause: The function COMPUTE must appear before each LABEL keyword.

Action: Check the syntax of the COMPUTE command for the correct usage.

SP2-0591 Unable to allocate dynamic space needed (number_of_bytes bytes)

Try reducing ARRAYSIZE or the number of columns selected

Cause: Unable to allocate memory to process the command.

Action: Free up additional memory by: closing applications not required; reducing the size of the command, or statement; or by recoding the query to select fewer records.

SP2-0593 Label text must follow the LABEL keyword

Cause: Missing label text about the LABEL keyword in the COMPUTE command.

Action: Check the syntax of the COMPUTE command for the correct options.

SP2-0594 Usage: SET COLSEP {" " | text}

Cause: An invalid option was used in the SET COLSEP command.

Action: Specify a valid option.

SP2-0596 Usage: SET AUTO[COMMIT] {OFF | ON | IMM[EDIATE] | n}

Cause: An invalid option was used in the SET AUTO[COMMIT] command.

Action: Check the syntax of the SET AUTOCOMMIT command for the correct options.

SP2-0597 datatype _name is not a valid datatype _name format

Cause: The value entered in the ACCEPT command was not in the specified datatype.

Action: Correct the datatype and re-enter.

SP2-0598 value_name does not match input format "format_name"

Cause: The value entered in the ACCEPT command was not in the specified format.

Action: Correct the format and try again.

SP2-0599 Usage: SET EDITF[ILE] filename[.ext]

Cause: Required filename was missing after the SET EDITFILE command.

Action: Check the syntax of the SET EDITFILE command for the correct options.

SP2-0603 Usage: Illegal STORE command.

Usage: STORE {SET} filename[.ext] [CRE[ATE] | REP[LACE] | APP[END]]

Cause: An invalid option was used in the STORE command.

Action: Check the syntax of the STORE command for the correct options.

SP2-0605 File file_name already exists. Use another name or STORE {SET} filename[.ext] REPLACE

Cause: The file specified in the STORE command already exists.

Action: Use the REPLACE option to overwrite the existing file, or specify another file name.

SP2-0606 Cannot create file_name file

Cause: The STORE command was unable to create the specified file. There may be insufficient disk space, too many open files, or read-only protection on the output directory.

Action: Check that there is sufficient disk space and that the protection on the directory enables file creation.

SP2-0607 Cannot close file_name file

Cause: The STORE command was unable to close the specified file. Another resource may have locked the file.

Action: Check that the file is not locked before closing it.

SP2-0608 Object object_name is a remote object, cannot further describe

Cause: Unable to DESCRIBE the remote object.

Action: No action required.

SP2-0609 Usage: SET AUTOT[RACE] {OFF | ON | TRACE[ONLY] } [EXP[LAIN]] [STAT[ISTICS]]

Cause: An invalid option was used in the SET AUTOTRACE command.

Action: Check the syntax of the SET AUTOTRACE command for the correct options.

SP2-0610 Error initializing feature_name

Cause: Not enough memory to enable this feature.

Action: Free up additional memory by closing applications not required, or reduce the size of the command, statement or query output.

SP2-0612 Error generating report_name report

Cause: Unable to generate the report using AUTOTRACE.

Action: Make a note of the message and the number, then contact the Database Administrator.

SP2-0613 Unable to verify PLAN_TABLE format or existence

Error enabling autotrace_report report

Cause: An AUTOTRACE command was issued by a user with insufficient privileges, or who did not have a PLAN_TABLE.

Action: Make sure the user has been granted the PLUSTRACE role, and that a PLAN_TABLE has been created for the user.

SP2-0614 Server version too low for this feature

Cause: The current version of the Oracle Server is too low for this feature.

Action: Use a higher version of the Oracle Server.

SP2-0617 Cannot construct a unique STATEMENT_ID

Cause: Unable to construct a unique statement ID in AUTOTRACE.

Action: Check that AUTOTRACE is configured and that you have the PLUSTRACE role enabled.

SP2-0618 Cannot find the Session Identifier. Check PLUSTRACE role is enabled

Error enabling autotrace_report report

Cause: Unable to find the session identifier.

Action: Check that the PLUSTRACE role has been granted.

SP2-0619 Error while connecting

Cause: An error occurred while AUTOTRACE attempted to make a second connection to the database instance.

Action: Check that the database limit on number of active sessions has not been exceeded.

SP2-0620 Error while disconnecting

Cause: An error occurred while AUTOTRACE attempted to disconnect from the database instance.

Action: Check that the database is still available.

SP2-0621 Error ORA -error_number while gathering statistics

Cause: No data was found in the PLAN_TABLE while gathering statistics using AUTOTRACE.

Action: Refer to the Oracle Database Error Messages for the specified ORA error message.

SP2-0622 Starting line number must be less than ending line number

Cause: The starting line number specified is larger than the ending number.

Action: Re-enter the starting line number with a smaller line number.

SP2-0623 Error accessing PRODUCT_USER_PROFILE.

Warning: Product user profile information not loaded!

You may need to run PUPBLD.SQL as SYSTEM

Cause: The PRODUCT_USER_PROFILE table has not been built in the SYSTEM account.

Action: The exact format of the file extension and location of the file are system dependent. See the SQL*Plus installation guide provided for your operating system. The script must be run as user SYSTEM.

SP2-0625 Error printing variable variable_name

Cause: Error encountered while printing the specified variable.

Action: Check that the specified variable is correct and try again.

SP2-0626 Error accessing package DBMS_APPLICATION_INFO

You may need to install the Oracle Procedural option

SET APPINFO requires Oracle Server Release 7.2 or later

Cause: This message is followed by a successful login to the Oracle Server. The DBMS_APPLICATION package is used to maintain on-line information about a particular application logged onto Oracle. SET APPINFO could not be initialized.

Action: This package is created during the running of the CATPROC.SQL and should be available on all databases from Oracle 7.2. Check that your database is correctly installed.

SP2-0631 String beginning string_name is too long.

Maximum size is 1 character

Maximum size is string_length characters

Cause: The string specified was too long.

Action: Reduce the size of the specified string and re-try the operation.

SP2-0640 Not connected.

Cause: The PASSWORD command was issued when there was no connection to the Oracle instance.

Action: Connect to the Oracle database before re-issuing the PASSWORD command.

SP2-0641 command_name requires connection to server

Cause: SQL*Plus was unable to execute the command because there was no connection to a database.

Action: Connect to a database and re-try the operation.

SP2-0642 SQL*Plus internal error state error_state context error_number.

Unsafe to proceed

Unable to proceed

Cause: An internal error occurred.

Action: Make a note of the message, then contact Oracle Support Services.

SP2-0645 Operating System error occurred

Unable to complete EDIT command

Cause: An operating system error occurred with the EDIT command.

Action: Check that the file was created successfully, and verify that the device you are writing to is still available.

SP2-0650 New passwords do not match

Cause: The new passwords entered did not match.

Action: Re-issue the PASSWORD command and make sure that the new passwords are entered correctly.

SP2-0659 Password unchanged

Cause: The PASSWORD command failed to change passwords because:

- No passwords were given.
- The new passwords did not match.

Action: Re-issue the PASSWORD command and make sure that the new passwords are entered correctly.

SP2-0666 WARNING: SHIFTINOUT only affects shift sensitive character sets

Cause: The NLS character set used in this session does not contain shift sensitive characters. The SET SHIFTINOUT command is unnecessary.

Action: No action required.

SP2-0667 Message file facility<lang>.msb not found

Cause: The SP1, SP2, or CPY message file could not be found. SQL*Plus cannot run.

Action: Check the Oracle platform specific documentation to make sure SQL*Plus is installed correctly. This may occur because the ORACLE_HOME environment variable or registry equivalent is not set to the location of the Oracle software. Make sure this value is set correctly. Check that the SQL*Plus binary message files exist in the SQL*Plus message directory, for example \$ORACLE_HOME/sqlplus/mesg. Check the value of NLS_LANG environment variable or registry equivalent is correct.

SP2-0668 Invalid variable name

Cause: An invalid character was specified as part of the variable name.

Action: Specify the variable with valid characters.

SP2-0669 Valid characters are alphanumeric and '_'

Cause: An invalid character was specified as part of the variable name.

Action: Specify the variable with alphanumeric characters and '_'.

SP2-0670 Internal number conversion failed

Cause: A conversion request could not be performed because the string contained alphanumeric characters.

Action: Make sure that the string only contains numeric digits.

SP2-0675 COPY command not available

Cause: The COPY command is not available in this version of SQL*Plus.

Action: Make a note of the message and the number, then contact Oracle Support Services.

SP2-0676 Bind variable length cannot exceed variable_length_units_of_variable

Cause: The length of the bind variable datatype was exceeded.

Action: Reduce the length of the bind variable datatype.

SP2-0678 Column or attribute type can not be displayed by SQL*Plus

Cause: The type specified is not supported.

Action: Rewrite the query to select the data with types that SQL*Plus supports.

SP2-0685 The date entered_variable is invalid or format mismatched format

Cause: An invalid date was entered or does not match the format.

Action: Enter a valid date or a date in the required format.

SP2-0686 Usage: DESCRIBE [schema.]object[@db_link]

Cause: An invalid option was used in the DESCRIBE command.

Action: Check the syntax of the DESCRIBE command for the correct options.

SP2-0692 Usage: CONN[ECT] [logon] [AS {SYSDBA | SYSOPER}]

Where <logon> ::= <username>[/<password>][@<connect_string>] | /

Cause: An invalid option was entered for the SQL*Plus CONNECT command.

Action: Check the syntax for the CONNECT command for the correct usage.

SP2-0714 Invalid combination of STARTUP options

Cause: The specified options of the STARTUP command cannot be used simultaneously.

Action: Check the syntax of the STARTUP command for the correct usage.

SP2-0715 Invalid combination of SHUTDOWN options

Cause: The specified options of the SHUTDOWN command cannot be used simultaneously.

Action: Check the syntax of the SHUTDOWN command for the correct usage.

SP2-0716 Invalid combination of ARCHIVE LOG options

Cause: The specified options of the ARCHIVE LOG command cannot be used simultaneously.

Action: Check the syntax of the ARCHIVE LOG command for the correct usage.

SP2-0717 Illegal SHUTDOWN option

Cause: An invalid option was used in the SHUTDOWN command.

Action: Check the syntax of the SHUTDOWN command for the correct options.

SP2-0718 Illegal ARCHIVE LOG option

Cause: An invalid option was used in the ARCHIVE LOG command.

Action: Check the syntax of the ARCHIVE LOG command for the correct options.

SP2-0728 Specify log: {<RET>=suggested | filename | AUTO | CANCEL}

Cause: This is a RECOVER DATABASE command prompt, prompting for the redo log files to be applied.

Action: Enter one of the redo log file options.

SP2-0729 Cannot SET INSTANCE while connected to a database

Cause: There was a problem with the connection instance while issuing the SET INSTANCE command.

Action: Disconnect from the instance before re-issuing the command.

SP2-0733 Invalid connect string

Cause: An invalid connect string was specified.

Action: Check that the connect string is correct.

SP2-0734 Unknown command beginning command_name ... - rest of line ignored

Cause: The command entered was invalid.

Action: Check the syntax of the command you used for the correct options.

SP2-0735 Unknown command_name option beginning option_name

Cause: An invalid option was specified for a given command.

Action: Check the syntax of the command you used for the correct options.

SP2-0736 Command line overflow while substituting into line beginning string_name

Cause: The maximum length of the command line was exceeded.

Action: Reduce the length of the data in the substitution variables used in the command.

SP2-0737 Usage: SET DESCRIBE [DEPTH {1 | n | ALL}] [LINENUM {ON | OFF}] [INDENT {ON | OFF}]

Cause: An invalid option was used in the SET DESCRIBE command.

Action: Check the syntax of the SET DESCRIBE command for the correct options.

SP2-0738 Restricted command command_name not available

Cause: For security reasons, the command was restricted by the -RESTRICT command-line option.

Action: Ask your Database Administrator why SQL*Plus should be run with a -RESTRICT option.

SP2-0745 Usage: SET SQLPLUSCOMPAT[IBILITY] version.release.[update]

Cause: An invalid option was used in the SET SQLPLUSCOMPAT[IBILITY] command.

Action: Check the syntax of the SET SQLPLUSCOMPATIBILITY command for the correct options.

SP2-0746 command_option option out of range (lower through upper)

Cause: The specified value was not in the range.

Action: Specify a value in the range.

SP2-0747 PAGESIZE must be at least max_page_size to run this query with LINESIZE line_size

Cause: The PAGESIZE setting was too small to display the specified LINESIZE.

Action: Increase the PAGESIZE to at least match the specified LINESIZE.

SP2-0749 Cannot resolve circular path of synonym synonym_name

Cause: An attempt was made to use a synonym to point to an object that no longer exists where the synonym had the same name as the base object, or an attempt was made to use a synonym that has a circular path that points back to itself.

Action: Make sure that the last synonym in the synonym path points to an object that exists, and that it doesn't point back to itself.

SP2-0750 ORACLE_HOME may not be set

Cause: SQL*Plus was unable to find a message file during program initialization, and could not display error messages or text required for normal operation. The most common cause is that ORACLE_HOME has not been set. Other possible causes are a corrupt or unreadable message file. On Windows the SQLPLUS registry entry may be invalid.

This message is hard coded (in English) in the SQL*Plus source code so it can be displayed on message file error. It could never be read from this message file because the error occurs only when the message files cannot be opened. This entry in the message file is for documentation purposes only.

Action: Make sure that all environment variables or registry entries needed to run SQL*Plus are set. The variables are platform specific but may include ORACLE_HOME, ORACLE_SID, NLS_LANG, and LD_LIBRARY_PATH.

On Windows if the environment variable called SQLPLUS is set, it must contain the directory name of the SQL*Plus message files, for example %ORACLE_HOME%\sqlplus\mesg.

Also check that the file sp1XX.msb is in the \$ORACLE_HOME/sqlplus/mesg or %ORACLE_HOME%\sqlplus\mesg directory. The "XX" stands for the country prefix associated with your NLS_LANG environment variable. SQL*Plus reads only one of the sp1XX.msb files. For example sp1ja.msb is read if NLS_LANG is JAPANESE_JAPAN.JA16EUC. If NLS_LANG is not set, then the default (English language) sp1us.msb is used. Check that the appropriate file is of non-zero size and that the file permissions allow it to be read. Note that ".msb" files are binary. The contents may be meaningless when viewed or printed. If you are unsure which language file is being used, unset NLS_LANG and run SQL*Plus to verify it can read the sp1us.msb file.

SP2-0751 Unable to connect to Oracle. Exiting SQL*Plus

Cause: No connection to an Oracle server could be made.

Action: Normally occurs after other errors showing that the database is not running, or that the username and password were invalid.

SP2-0752 Usage: -C[COMPATIBILITY] version.release.[update]

Cause: An invalid option was used in the -C[COMPATIBILITY] command option.

Action: Check the syntax of the SQL*Plus executable for the correct options.

SP2-0753 STARTUP with MIGRATE only valid with Oracle 9.2 or greater

Cause: STARTUP MIGRATE was used to try to startup an Oracle server for a release prior to 9.2.

Action: Check the platform specific environment to verify that you are connecting to an Oracle server that is at least release 9.2.

SP2-0754 FROM clause cannot contain AS SYSDBA or AS SYSOPER

Cause: The COPY command does not support AS SYSDBA or AS SYSOPER connections.

Action: Remove AS SYSDBA or AS SYSOPER from the FROM clause.

SP2-0755 TO clause cannot contain AS SYSDBA or AS SYSOPER

Cause: The COPY command does not support AS SYSDBA or AS SYSOPER connections.

Action: Remove AS SYSDBA or AS SYSOPER from the TO clause.

SP2-0756 FROM clause length clause_len bytes exceeds maximum length max_len

Cause: The FROM clause is too long.

Action: Reduce the string specified in the FROM clause.

SP2-0757 TO clause length clause_len bytes exceeds maximum length max_len

Cause: The TO clause is too long.

Action: Reduce the string specified in the TO clause.

SP2-0758 FROM clause missing username or connection identifier

Cause: The COPY command FROM clause must include a username and a connection identifier.

Action: Specify a username and a connection identifier in the FROM clause.

SP2-0759 TO clause missing username or connection identifier

Cause: The COPY command TO clause must include a username and a connection identifier.

Action: Specify a username and a connection identifier in the TO clause.

SP2-0762 Mismatched quotes in SHOW ERRORS [object]

Cause: Invalid syntax was found in the object name submitted as an argument to SHOW ERRORS.

Action: If quotes are used, check that they are correctly matched. Either quote the whole argument, or quote the schema and object components separately.

SP2-0768 Illegal SPOOL command

Cause: An invalid option was used in the SPOOL command.

Action: Check the syntax of the SPOOL command for the correct options.

SP2-0769 Usage: SPOOL { <file> | OFF | OUT }

where <file> is file_name[.ext] [CRE[ATE]| REP[LACE]| APP[END]]

Cause: Incorrect syntax for the SPOOL command was entered.

Action: Check the syntax of the SPOOL command for the correct usage.

SP2-0771 File filename already exists. Use another name or "SPOOL filename[.ext] REPLACE"

Cause: The file specified in the SPOOL command already exists.

Action: Use the REPLACE option to overwrite the existing file, or specify another file name.

SP2-0772 Automatic Storage Manager instance started

Cause: Document: Feedback message

Action:

SP2-0773 Automatic Storage Manager diskgroups mounted

Cause: Document: Feedback message

Action:

SP2-0774 Automatic Storage Manager instance shutdown

Cause: Document: Feedback message

Action:

SP2-0775 Automatic Storage Manager diskgroups dismantled

Cause: Document: Feedback message

Action:

SP2-0776 Invalid schema and object separator in SHOW ERRORS [object]

Cause: Invalid syntax was found in the object name submitted as an argument to SHOW ERRORS.

Action: If a schema is specified, check that the schema and object names are separated by a period.

SP2-0777 Invalid single quotes in SHOW ERRORS [object]

Cause: Invalid syntax was found in the object name submitted as an argument to SHOW ERRORS.

Action: If the SHOW ERRORS argument is quoted, check that only double quotes are used. Either quote the whole argument, or quote the schema and object components separately.

SP2-0778 Script filename and arguments too long

Cause: The combined length of the script filename and script arguments is too long for SQL*Plus.

Action: Reduce the length of the script name and path. Reduce the number and/or size of the script arguments.

SP2-0780 Value entered is not a valid datatype

Cause: The value entered in the ACCEPT command was not valid for the specified datatype.

Action: Enter a valid number within a valid range for the datatype.

SP2-0781 command option option_name out of range (min through max)

Cause: Attempted to enter a value outside the allowed range for the command option.

Action: Check the limits for the command option and enter a value within the allowed range.

SP2-0782 Prelim connection established

Cause: Document: Feedback message

Action:

SP2-0783 Cannot SET variable while connected to a database

Cause: Attempted to set a system variable that cannot be set while still connected to a database instance.

Action: Disconnect from the database instance before attempting to set the system variable.

SP2-0784 Invalid or incomplete character beginning byte returned

Cause: Attempted to return a string from the database that contained an invalid or incomplete character.

Action: Replace the invalid or incomplete string in the database with a valid or complete string.

SP2-0804 Procedure created with compilation warnings

Cause: The PL/SQL procedure has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL procedure.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0805 Procedure altered with compilation warnings

Cause: The PL/SQL procedure has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL procedure.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0806 Function created with compilation warnings

Cause: The PL/SQL function has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL function.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0807 Function altered with compilation warnings

Cause: The PL/SQL function has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL function.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0808 Package created with compilation warnings

Cause: The PL/SQL package has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL package.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0809 Package altered with compilation warnings

Cause: The PL/SQL package has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL package.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0810 Package Body created with compilation warnings

Cause: The PL/SQL package body has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL package body.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0811 Package Body altered with compilation warnings

Cause: The PL/SQL package body has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL package body.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0812 View created with compilation warnings

Cause: The PL/SQL view has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL view.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0813 View altered with compilation warnings

Cause: The PL/SQL view has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL view.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0814 Trigger created with compilation warnings

Cause: The PL/SQL trigger has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL trigger.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0815 Trigger altered with compilation warnings

Cause: The PL/SQL trigger has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL trigger.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0816 Type created with compilation warnings

Cause: The PL/SQL type has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL type.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0817 Type altered with compilation warnings

Cause: The PL/SQL type has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL type.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0818 Type Body created with compilation warnings

Cause: The PL/SQL type body has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL type body.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0819 Type Body altered with compilation warnings

Cause: The PL/SQL type body has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL type body.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0820 Library created with compilation warnings

Cause: The PL/SQL library has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL library.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0821 Library altered with compilation warnings

Cause: The PL/SQL library has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL library.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0822 Java created with compilation warnings

Cause: The PL/SQL java has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL java.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0823 Java altered with compilation warnings

Cause: The PL/SQL java has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL java.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0824 PL/SQL compilation warnings

Cause: The PL/SQL block has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL block.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0825 Dimension created with compilation warnings

Cause: The PL/SQL dimension has been created, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL dimension.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0826 Dimension altered with compilation warnings

Cause: The PL/SQL dimension has been altered, but has one or more warnings, informational messages or performance messages that may help you to improve your PL/SQL dimension.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0827 Procedure created with compilation errors

Cause: The PL/SQL procedure has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0828 Procedure altered with compilation errors

Cause: The PL/SQL procedure has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0829 Function created with compilation errors

Cause: The PL/SQL function has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0830 Function altered with compilation errors

Cause: The PL/SQL function has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0831 Package created with compilation errors

Cause: The PL/SQL package has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0832 Package altered with compilation errors

Cause: The PL/SQL package has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0833 Package Body created with compilation errors

Cause: The PL/SQL package body has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0834 Package Body altered with compilation errors

Cause: The PL/SQL package body has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0835 View created with compilation errors

Cause: The PL/SQL view has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0836 View altered with compilation errors

Cause: The PL/SQL view has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0837 Trigger created with compilation errors

Cause: The PL/SQL trigger has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0838 Trigger altered with compilation errors

Cause: The PL/SQL trigger has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0839 Type created with compilation errors

Cause: The PL/SQL type has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0840 Type altered with compilation errors

Cause: The PL/SQL type has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0841 Type Body created with compilation errors

Cause: The PL/SQL type body has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0842 Type Body altered with compilation errors

Cause: The PL/SQL type body has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0843 Library created with compilation errors

Cause: The PL/SQL library has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0844 Library altered with compilation errors

Cause: The PL/SQL library has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0845 Java created with compilation error

Cause: The PL/SQL java has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0846 Java altered with compilation errors

Cause: The PL/SQL java has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0847 PL/SQL compilation errors

Cause: The PL/SQL block has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0848 Dimension created with compilation errors

Cause: The PL/SQL dimension has been created, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-0849 Dimension altered with compilation errors

Cause: The PL/SQL dimension has been altered, but has one or more error messages.

Action: Use the SQL*Plus SHOW ERR[ORS] command to display the warnings and messages.

SP2-1500 STARTUP with UPGRADE only valid with Oracle 9.2 or greater

Cause: STARTUP UPGRADE was used to try to startup an Oracle server for a release prior to 9.2.

Action: Check the platform specific environment to verify that you are connecting to an Oracle server that is at least release 9.2.

SP2-1501 STARTUP with DOWNGRADE only valid with Oracle 9.2 or greater

Cause: STARTUP DOWNGRADE was used to try to startup an Oracle server for a release prior to 9.2.

Action: Check the platform specific environment to verify that you are connecting to an Oracle server that is at least release 9.2.

SP2-1502 The HTTP proxy server specified by http_proxy is not accessible

Cause: The HTTP proxy server used by SQL*Plus cannot be accessed. SQL*Plus will be unable to run scripts located on a web server.

Action: Check that the proxy setting has the correct value, or unset it if no proxy is needed. SQL*Plus may get the proxy name from the environment variable http_proxy, or the value may be set in another way on your system. Check that the given proxy server is operational. Most web browsers can be configured to use a proxy. Configure a browser to use the desired proxy and verify that web pages can still be loaded.

SP2-1503 Unable to initialize Oracle call interface

Cause: Indicates a library used by SQL*Plus to communicate with the database failed to initialize correctly.

Action: Check that the Oracle environment or registry entries are consistent and correct. If using the SQL*Plus Instant Client make sure the SQL*Plus and Oracle libraries are from the same release. Make sure you have read access to the libraries.

SP2-1504 Cannot print uninitialized LOB variable

Cause: The specified LOB variable should be initialized before printing.

Action: Check that the specified variable is initialized and try again.

SP2-1505 Invalid COL or TAB position entered

Cause: The BTITLE, TTITLE, REPHEADER or REPFOOTER command you entered attempts to use a COL or TAB value greater than 240, or a COL or TAB value greater than LINESIZE if LINESIZE is greater than 240.

Action: Make sure the BTITLE, TTITLE, REPHEADER or REPFOOTER command you enter uses a COL or TAB value of 240 or less, or uses a COL or TAB value of LINESIZE or less if LINESIZE is greater than 240.

iSQL*Plus Error Messages

SP2-0850 Command `command_name` is not available in iSQL*Plus

Cause: The command was not recognized by the SQL*Plus engine, or it is disabled in iSQL*Plus. This occurs if it is a command that does not have any meaning in iSQL*Plus (such as a SQL buffer editing command), or it is not allowed for security reasons, or it is an obsolete command.

Action: Remove the command from your script. If you used a disabled command, check the documentation for a replacement command.

SP2-0851 Command beginning `command_name...` is not available in iSQL*Plus

Cause: The command was not recognized by the SQL*Plus engine, or it is disabled in iSQL*Plus. This occurs if it is a command that does not have any meaning in iSQL*Plus (such as a SQL buffer editing command), or it is not allowed for security reasons, or it is an obsolete command.

Action: Remove the command from your script. If you used a disabled command, check the documentation for a replacement command.

SP2-0852 Option not available in iSQL*Plus

Cause: The command option is not available in iSQL*Plus. This error usually occurs after SP2-158 or SP2-735. Some options are disabled in a web based context because they have no meaning, because they prevent proper operation, or because they pose a security risk.

Action: Remove the option from the command.

SP2-0853 Empty username field

Cause: The Username field of the iSQL*Plus Login screen was empty.

Action: Enter a username before attempting to log in.

SP2-0854 Password cannot be entered twice

Cause: An error occurred while parsing the Username and Password fields of the iSQL*Plus Login screen.

Action: Check that you haven't specified a password as part of the username (for example "scott/tiger") and simultaneously put the password in the Password field of the Login screen. The password should appear once only. This error occurs when iSQL*Plus can't determine what password you intended to use.

SP2-0855 Connect identifier cannot be entered twice

Cause: An error occurred while trying to read the connection identifier in the Connection Identifier field of the iSQL*Plus Login screen.

Action: If the full connection syntax is used in the Username field (for example "username/password@connect_identifier") then the Connection Identifier field must be empty.

SP2-0856 Usage: CONN[ECT] username/password[@connect_identifier] [AS {SYSOPER | SYSDBA}]

or: CONN[ECT] /[@connect_identifier] AS {SYSOPER | SYSDBA}

Cause: iSQL*Plus was unable to connect to an Oracle instance, or the username and password were incorrect. An incomplete or incorrect CONNECT command was specified in an iSQL*Plus script.

Action: All authentication information must be included in the CONNECT command in iSQL*Plus. Make sure that both a username and password are used.

SP2-0858 Usage: SET MARKUP HTML [ON] [HEAD text] [BODY text] [TABLE text] [PRE[FORMAT] {ON | OFF}]

Cause: An invalid option to SET MARKUP was entered in iSQL*Plus.

Action: Remove the invalid option.

SP2-0860 For a list of known commands enter HELP

Cause: An invalid command sequence was entered.

Action: Use the HELP command to show the syntax of SQL*Plus commands.

SP2-0863 iSQL*Plus processing completed

Cause: All commands in the iSQL*Plus input script have been executed with no explicit output.

Action: No action required.

SP2-0864 Session has expired. Please log in again

Cause: The iSQL*Plus session was idle for too long and the context has been removed to free resources for other connections.

Action: Reconnect to iSQL*Plus. The System Administrator configures the timeout period.

SP2-0865 Session is blocked. Please log in again

Cause: An attempt was made to execute a query from iSQL*Plus when a previous query was still processing. This condition occurs when the browser Back button, or Stop button is pressed during query processing.

Action: Reconnect to iSQL*Plus.

SP2-0866 Please enter statements in the Input area

Cause: The Execute button was clicked when there were no statements in the Input area to execute.

Action: Enter statements to run in the Input area and click Execute again.

SP2-0867 No script to be saved

Cause: Save Script was clicked when there were no statements in the Input area to save.

Action: Enter statements to save in the Input area and click Save Script again.

SP2-0868 No script to execute

Cause: An attempt was made to execute a script and output the results to a file when there were no statements in the script to execute.

Action: Make sure the script contains statements to execute and execute the script again.

SP2-0869 Invalid file content

Cause: Attempted to load a script into the Input area with a format the web server cannot understand.

Action: Make sure the script is in a text file and the MIME type settings needed by your browser to recognize the file are set correctly. Typically if you are loading a file with the extension .SQL then make sure the browser has a "SQL" MIME type.

SP2-0871 No script to load

Cause: Clicked Load Script but either no file name was specified, or the specified file name did not exist, or if it existed, it was empty.

Action: Enter the name of an existing file into the field and try again, or if the specified file existed but was empty, no action is required.

SP2-0872 SET AUTORECOVERY ON must be used in iSQL*Plus

Cause: Attempted to use the interactive mode of the RECOVER command in iSQL*Plus. Use the autorecovery mode in iSQL*Plus.

Action: Switch SET AUTORECOVERY ON and rerun the RECOVER command.

SP2-0873 An unexpected quote was found in the URL argument

Cause: A quote was found in the middle of the value portion of a keyword/value pair.

Action: Check for and remove the extra quote.

SP2-0874 URL argument is missing a keyword

Cause: No keyword was found in a keyword/value pair of a URL argument.

Action: Check for a missing keyword or perhaps a missing equals sign.

SP2-0875 URL argument contains a keyword but no value

Cause: The value for a keyword was missing in a keyword/value pair of a URL.

Action: Check for a missing value or perhaps a missing equals sign.

SP2-0876 URL argument is missing an end quote

Cause: Could not find the end quote to match an open quote in a keyword/value pair of a URL.

Action: Check for and insert the matching end quote.

SP2-0877 Found an unexpected character in a URL argument

Cause: Already have a keyword/value pair where the value is quoted but extra characters were still found in a URL argument.

Action: Remove the extra characters.

SP2-0878 Duplicate keyword keyword specified

Cause: The keyword was already specified in a previous parameter of a URL argument.

Action: Remove one of the keyword occurrences.

SP2-0879 Must specify a script for dynamic reports to execute

Cause: The script keyword was not specified in the URL.

Action: Add a script keyword/value pair to the URL argument.

SP2-0880 Enter connection details to run script script_url

Cause: iSQL*Plus could not log in to the server because there was not URL "userid" argument, or the information supplied was insufficient or incorrect.

Action: Log in through the Login screen to execute the Dynamic Report script.

SP2-0882 Empty password field

Cause: The password field of the iSQL*Plus Login screen was empty.

Action: Enter your password before attempting to log in.

SP2-0883 Invalid Input area size specified

Cause: The width or height specified for the Input area size was either not a numeric value, or was not in the range 1 to 999.

Action: Re-enter valid numeric values for the Input area size.

SP2-0884 Connection to database connect_identifier is not allowed

Cause: An attempt was made to connect to a database that SQL*Plus has not been configured to allow connections to.

Action: If this occurred with the CONNECT command in iSQL*Plus, the "iSQLPlusConnectIdList" configuration parameter in the web.xml file does not include the connection identifier used. For example, when the command "CONNECT username/password@connect_identifier" is entered, the "connect_identifier" must match a connection identifier in the parameter list. The connection identifier is not case sensitive.

SP2-0885 Only a valid username or '/' is allowed in the username field

Cause: An attempt was made to enter a value other than a username or '/' in the iSQL*Plus Login screen Username field.

Action: Only a username is allowed in the iSQL*Plus Login screen Username field. A username, or "/" is allowed in the iSQL*Plus DBA Login screen.

SP2-0886 No scripts in history

Cause: No scripts are available in the history list because no scripts have yet been executed in this session.

Action: Scripts are only made available in the history list after they have been executed in the session.

SP2-0887 History size specified is non numeric or outside the range [0 -100]

Cause: The history size specified was either not a numeric value, or was not in the range 0 to 100.

Action: Re-enter a numeric value in the range 0 to 100 for the history size.

SP2-0889 The value specified for the keyword type must be either URL or TEXT

Cause: The value entered for the specified keyword was invalid.

Action: Re-enter the command using a valid value for the specified keyword. Valid values for the keyword "type" are "URL" or "TEXT".

SP2-0890 Instance not set, or connect identifier not specified

Cause: No connect identifier or database instance was specified for the connect command or the SET INSTANCE command.

Action: Re-enter the command and specify a valid connect identifier or database instance.

SP2-0892 Error expiring session

Cause: *iSQL*Plus* could not close the timed out session identified by the user session Id.

Action: No action required.

SP2-0893 Expired session

Cause: *iSQL*Plus* has expired the timed out session identified by the user session Id.

Action: No action required.

SP2-0894 Unsuccessful log in for username from URL to connect_id

Cause: *iSQL*Plus* failed to log in user with the given username, URL and connect identifier.

Action: No action required.

SP2-0896 Failed to log out username

Cause: *iSQL*Plus* failed to log out user with given user session Id.

Action: No action required.

SP2-0911 Only a password is allowed in the password field

Cause: An attempt was made to enter a value other than a password in the *iSQL*Plus* Login screen Password field.

Action: Only a valid password is allowed in the Password field.

SP2-0912 Only a connect identifier is allowed in the connection identifier field

Cause: An attempt was made to enter a value other than a valid connection identifier in the *iSQL*Plus* Login screen Connection Identifier field.

Action: Only a valid connection identifier or a valid alias is allowed in the Connection Identifier field.

SP2-0913 No keywords recognised by *iSQL*Plus*

Cause: An attempt was made to request a service from *iSQL*Plus* by manually typing in the URL, but no keywords could be recognized.

Action: Refer to the *iSQL*Plus* documentation for the syntax, and types of service that can be manually entered in a URL.

SP2-0914 Value "value" for keyword "keyword" not recognised by *iSQL*Plus*

Cause: An attempt was made to request a service from *iSQL*Plus* by manually typing in the URL, but the value specified for a keyword was not recognized.

Action: Refer to the *iSQL*Plus* documentation for the syntax, and types of service that can be manually entered in a URL.

SP2-0915 Cookies may have been disabled

Cause: After logging in, *iSQL*Plus* can only process further requests if cookies are enabled on your browser.

Action: Enable cookies on your browser and log in again.

SP2-0916 Scheme *scheme* not supported

Cause: *iSQL*Plus* only supports HTTP, HTTPS and FTP.

Action: Change the scheme to one that is supported.

SP2-0917 User requested cancel

Cause: The *iSQL*Plus* script that was running has been cancelled by the user. It may have been cancelled by clicking the Cancel button, by re-executing the script, or by clicking any other button or link on the Workspace.

Action: No action required.

SP2-0918 HTTP error *number* on attempt to open URL

Cause: An HTTP error occurred while attempting to fetch the contents of a URL. The URL may have been renamed, removed or be temporarily unavailable.

Action: Check that the URL is spelled correctly and that it is available from the requested server.

SP2-0920 HTTP error *message* on attempt to open URL

Cause: An HTTP error occurred while attempting to fetch the contents of a URL. The URL may have been renamed, removed or be temporarily unavailable.

Action: Check that the URL is spelled correctly and that it is available from the requested server.

SP2-0921 The value specified for the keyword action must be either EXECUTE or LOAD

Cause: The value entered for the specified keyword was invalid.

Action: Re-enter the command using a valid value for the specified keyword. Valid values for the keyword "action" are "EXECUTE" or "LOAD".

SP2-0923 AS SYSDBA or AS SYSOPER login not allowed through the *iSQL*Plus* URL

Cause: An attempt was made to log in through the *iSQL*Plus* URL with AS SYSDBA or AS SYSOPER privilege.

Action: AS SYSDBA or AS SYSOPER privileged login is only permitted through the *iSQL*Plus* DBA URL. Remove the AS SYSDBA or AS SYSOPER arguments from the login request, or log in through the *iSQL*Plus* DBA URL.

SP2-0924 Supplied connect string has duplicate or incorrect keyword

Cause: The login details supplied in the connect string may contain a duplicate keyword, an incorrect keyword or an out of sequence keyword.

Action: Check the syntax of the connect string and fix or remove the incorrect content.

SP2-0925 No scripts selected to load or delete

Cause: In the History page, no scripts were selected for loading or deleting from the history list.

Action: Click the checkbox of each script to be loaded or deleted and then click the Load or Delete button.

SP2-0926 *iSQL*Plus* internal error: state = number, message = message

Cause: An internal error has occurred in *iSQL*Plus*.

Action: Make a note of the message, then contact Oracle Support Services.

SP2-0927 CONNECT AS SYSDBA or AS SYSOPER not allowed through *iSQL*Plus* URL

Cause: An attempt was made to CONNECT with AS SYSDBA or AS SYSOPER privileges through the *iSQL*Plus* URL.

Action: CONNECT with AS SYSDBA or AS SYSOPER privileges is only permitted through the iSQL*Plus DBA URL. Remove the AS SYSDBA or AS SYSOPER arguments from the CONNECT request, or CONNECT through the iSQL*Plus DBA URL.

SP2-0929 To use ENTMAP reconfigure iSQLPlusAllowUserMarkup in the iSQL*Plus Server

Cause: The iSQL*Plus Server has been configured to prevent the use of SET MARKUP HTML ENTMAP and COLUMN ENTMAP.

Action: The System Administrator can change the value of iSQLPlusAllowUserMarkup in the iSQL*Plus Server configuration to allow use of the ENTMAP option.

SP2-0930 Enter a URL or a path and file name, not both

Cause: In the iSQL*Plus Load Script screen, the location of a script to load into the Workspace was specified in both the URL and File fields. A script can be loaded from a URL, or from the local file system, but not from both at the same time.

Action: Enter either a URL, or a path and file name.

SP2-0931 Connection Identifier contains an illegal parameter

Cause: When attempting to login to iSQL*Plus, an illegal parameter was found in the Connection Identifier string.

Action: Modify the Connection Identifier string to remove the illegal parameter and attempt to log in again.

SP2-0932 Size specified for script width is non numeric or outside the range [1 -500]

Cause: The size specified for the script width was either not a numeric value, or was not in the range 1 to 500.

Action: Re-enter a numeric value in the range 1 to 500 for the script width.

SP2-0933 Size specified for script height is non numeric or outside the range [1 - 300]

Cause: The size specified for the script height was either not a numeric value, or was not in the range 1 to 300.

Action: Re-enter a numeric value in the range 1 to 300 for the script height.

SP2-0934 iSQL*Plus Server currently has insufficient memory to complete this script

Cause: The iSQL*Plus Server could not completely execute the script because there was not enough memory available. Part of the script may have executed. Some specific causes are:

1. The Java VM heap grew too large due to executing scripts with large output or with too many concurrent sessions.
2. Insufficient physical memory available for the Java VM.

Action: One or more of the following may help:

1. Edit queries to reduce the number of rows returned.
2. Turn iSQL*Plus multi page output on to reduce the number of rows cached.
3. Schedule large scripts sequentially.
4. Use Oracle Resource Manager to limit user queries.

5. Modify the iSQL*Plus OC4J startup script. Increase the -Xmx and -Xms values to allocate more memory to iSQL*Plus.
6. Review DDL and DCL that may have been executed prior to the memory shortage. Reexecute the script.

SP2-0935 Invalid dynamic report URL

Cause: Either required parameters are missing from the dynamic report URL or there are special characters in the URL that are not HTML encoded.

Action: Check that all parameters are correct and that any special characters are HTML encoded before submitting the dynamic report URL again.

SP2-0936 URL access is disabled in iSQL*Plus

Cause: @, @@ or START was used with a URL, or a dynamic report referenced a URL. The iSQL*Plus Administrator has disabled this functionality.

Action: Contact your iSQL*Plus Administrator.

COPY Command Messages

CPY-0002 Illegal or missing APPEND, CREATE, INSERT, or REPLACE option

Cause: An internal COPY function has invoked COPY with a create option (flag) value that is out of range.

Action: Please contact Oracle Worldwide Customer Support Services.

CPY-0003 Internal Error: logical host number out of range

Cause: An internal COPY function has been invoked with a logical host number value that is out of range.

Action: Please contact Oracle Worldwide Customer Support Services.

CPY-0004 Source and destination table and column names don't match

Cause: On an APPEND operation or an INSERT (when the table exists), at least one column name in the destination table does not match the corresponding column name in the optional column name list or in the SELECT command.

Action: Re-specify the COPY command, making sure that the column names and their respective order in the destination table match the column names and column order in the optional column list or in the SELECT command

CPY-0005 Source and destination column attributes don't match

Cause: On an APPEND operation or an INSERT (when the table exists), at least one column in the destination table does not have the same datatype as the corresponding column in the SELECT command.

Action: Re-specify the COPY command, making sure that the data types for items being selected agree with the destination. Use TO_DATE, TO_CHAR, and TO_NUMBER to make conversions.

CPY-0006 Select list has more columns than destination table

Cause: On an APPEND operation or an INSERT (when the table exists), the number of columns in the SELECT command is greater than the number of columns in the destination table.

Action: Re-specify the COPY command, making sure that the number of columns being selected agrees with the number in the destination table.

CPY-0007 Select list has fewer columns than destination table

Cause: On an APPEND operation or INSERT (when the table exists), the number of columns in the SELECT command is less than the number of columns in the destination table.

Action: Re-specify the COPY command, making sure that the number of columns being selected agrees with the number in the destination table.

CPY-0008 More column list names than columns in the destination table

Cause: On an APPEND operation or an INSERT (when the table exists), the number of columns in the column name list is greater than the number of columns in the destination table.

Action: Re-specify the COPY command, making sure that the number of columns in the column list agrees with the number in the destination table.

CPY-0009 Fewer column list names than columns in the destination table

Cause: On an APPEND operation or an INSERT (when the table exists), the number of columns in the column name list is less than the number of columns in the destination table.

Action: Re-specify the COPY command, making sure that the number of columns in the column list agrees with the number in the destination table.

CPY-0012 Datatype cannot be copied

Cause: An attempt was made to copy a datatype that is not supported in the COPY command. Datatypes supported by the COPY command are CHAR, DATE, LONG, NUMBER and VARCHAR2.

Action: Re-specify the COPY command, making sure that the unsupported datatype column is removed. For more information, see [Appendix B, "SQL*Plus COPY Command"](#).

Part IV

SQL*Plus Appendixes

Part IV contains the following SQL*Plus appendixes:

- [SQL*Plus Limits](#)
- [SQL*Plus COPY Command](#)
- [Obsolete SQL*Plus Commands](#)
- [Commands Not Supported in iSQL*Plus](#)
- [SQL*Plus Instant Client](#)

SQL*Plus Limits

The general SQL*Plus limits shown are valid for most operating systems.

Table A-1 SQL*Plus Limits

Item	Limit
filename length	system dependent
username length	30 bytes
substitution variable name length	30 bytes
substitution variable value length	240 characters
command-line length	2500 characters
LONG	2,000,000,000 bytes
LINESIZE	system dependent
LONGCHUNKSIZE value	system dependent
output line size	system dependent
SQL or PL/SQL command-line size after variable substitution	3,000 characters (internal only)
number of characters in a COMPUTE command label	500 characters
number of lines per SQL command	500 (assuming 80 characters per line)
maximum PAGESIZE	50,000 lines
total row width	32,767 characters
maximum ARRAYSIZE	5000 rows
maximum number of nested scripts	20
maximum page number	99,999
maximum PL/SQL error message size	2K
maximum ACCEPT character string length	240 Bytes
maximum number of substitution variables	2048

SQL*Plus COPY Command

This appendix discusses the following topics:

- [COPY Command Syntax](#)
- [Copying Data from One Database to Another](#)
- [Copying Data between Tables on One Database](#)

Read this chapter while sitting at your computer and try out the example shown. Before beginning, make sure you have access to the sample tables described in [SQL*Plus Quick Start](#) on page xix.

The COPY command will be obsoleted in future releases of SQL*Plus. No new datatypes will be supported by COPY.

COPY Command Syntax

```
COPY {FROM database | TO database | FROM database TO database}  
{APPEND|CREATE|INSERT|REPLACE} destination_table [(column, column, column, ...)]  
USING query
```

where *database* has the following syntax:

```
username[/password]@connect_identifier
```

Copies data from a query to a table in the same or another database. COPY supports the following datatypes:

```
CHAR  
DATE  
LONG  
NUMBER  
VARCHAR2
```

Warning: Including your password in plain text is a security risk. You can avoid this risk by omitting the password, and entering it only when the system prompts for it.

Terms

See the following list for a description of each term or clause:

FROM *database*

The database that contains the data to be copied. If you omit the FROM clause, the source defaults to the database to which SQL*Plus is connected (that is, the database

that other commands address). You must use a FROM clause to specify a source database other than the default.

The COPY command FROM clause does not support SYSDBA or SYSOPER privileged connections.

TO *database*

The database containing the destination table. If you omit the TO clause, the destination defaults to the database to which SQL*Plus is connected (that is, the database that other commands address). You must use a TO clause to specify a destination database other than the default. The COPY command TO clause does not support SYSDBA or SYSOPER privileged connections.

database

Specifies *username[/password] @connect_identifier* of the Oracle Database source or destination database you wish to COPY FROM or COPY TO.

The COPY command does not support SYSDBA or SYSOPER privileged connections. You must include a username. SQL*Plus prompts you for the password associated with the username specified in the COPY FROM or COPY TO clauses. SQL*Plus suppresses the display of your password response.

You must include the *connect_identifier* clause to specify the source or destination database. The exact syntax depends on the Oracle Net configuration. For more information, refer to the Oracle Net manual or contact your DBA.

APPEND

Inserts the rows from query into *destination_table* if the table exists. If *destination_table* does not exist, COPY creates it.

CREATE

Inserts the rows from query into *destination_table* after first creating the table. If *destination_table* already exists, COPY returns an error.

INSERT

Inserts the rows from query into *destination_table*. If *destination_table* does not exist, COPY returns an error. When using INSERT, the USING *query* must select one column for each column in *destination_table*.

REPLACE

Replaces *destination_table* and its contents with the rows from query. If *destination_table* does not exist, COPY creates it. Otherwise, COPY drops the existing table and replaces it with a table containing the copied data.

destination_table

Represents the table you wish to create or to which you wish to add data.

(*column, column, column, ...*)

Specifies the names of the columns in *destination_table*. You must enclose a name in double quotes if it contains lowercase letters or blanks.

If you specify columns, the number of columns must equal the number of columns selected by the query. If you do not specify any columns, the copied columns will have the same names in the destination table as they had in the source if COPY creates *destination_table*.

USING *query*

Specifies a SQL query (SELECT command) determining which rows and columns COPY copies.

Usage

To enable the copying of data between Oracle and non-Oracle databases, NUMBER columns are changed to DECIMAL columns in the destination table. Hence, if you are copying between Oracle databases, a NUMBER column with no precision will be changed to a DECIMAL(38) column. When copying between Oracle databases, you should use SQL commands (CREATE TABLE AS and INSERT) or you should ensure that your columns have a precision specified.

The SQL*Plus SET LONG variable limits the length of LONG columns that you copy. If any LONG columns contain data longer than the value of LONG, COPY truncates the data.

SQL*Plus performs a commit at the end of each successful COPY. If you set the SQL*Plus SET COPYCOMMIT variable to a positive value n, SQL*Plus performs a commit after copying every n batches of records. The SQL*Plus SET ARRAYSIZE variable determines the size of a batch.

Some operating environments require that service names be placed in double quotes.

Examples

The following command copies the entire EMPLOYEES table to a table named WESTEMPLOYEES. Note that the tables are located in two different databases. If WESTEMPLOYEES already exists, SQL*Plus replaces the table and its contents. The columns in WESTEMPLOYEES have the same names as the columns in the source table, EMPLOYEES.

```
COPY FROM HR@HQ TO JOHN@WEST -
REPLACE WESTEMPLOYEES -
USING SELECT * FROM EMPLOYEES
```

The following command copies selected records from EMPLOYEES to the database to which SQL*Plus is connected. SQL*Plus creates SALESMEN through the copy. SQL*Plus copies only the columns EMPLOYEE_ID and LAST_NAME, and at the destination names them EMPLOYEE_ID and SA_MAN.

```
COPY FROM HR@ORACLE01 -
CREATE SALESMEN (EMPLOYEE_ID, SA_MAN) -
USING SELECT EMPLOYEE_ID, LAST_NAME FROM EMPLOYEES -
WHERE JOB_ID='SA_MAN';
```

Copying Data from One Database to Another

Use the SQL*Plus COPY command to copy CHAR, DATE, LONG, NUMBER or VARCHAR2 data between databases and between tables on the same database. With the COPY command, you can copy data between databases in the following ways:

- Copy data from a remote database to your local database.
- Copy data from your local (default) database to a remote database (most systems).
- Copy data from one remote database to another remote database (most systems).

Note: In general, the COPY command was designed to be used for copying data between Oracle and non-Oracle databases. You should use SQL commands (CREATE TABLE AS and INSERT) to copy data between Oracle databases.

Understanding COPY Command Syntax

You enter the COPY command in the following form:

```
COPY FROM database TO database action -  
destination_table (column_name, column_name, -  
column_name ...) USING query
```

Here is a sample COPY command:

```
COPY FROM HR@BOSTONDB -  
TO TODD@CHICAGODB -  
CREATE NEWDEPT (DEPARTMENT_ID, DEPARTMENT_NAME, CITY) -  
USING SELECT * FROM EMP_DETAILS_VIEW
```

To specify a database in the FROM or TO clause, you must have a valid username and password for the local and remote databases and know the appropriate Oracle Net service names. COPY obeys Oracle Database security, so the username you specify must have been granted access to tables for you to have access to tables. For information on what databases are available to you, contact your DBA.

When you copy to your local database from a remote database, you can omit the TO clause. When you copy to a remote database from your local database, you can omit the FROM clause. When you copy between remote databases, you must include both clauses. However, including both clauses increases the readability of your scripts.

The COPY command behaves differently based on whether the destination table already exists and on the action clause you enter (CREATE in the example). See [Controlling Treatment of the Destination Table](#) on page B-5 for more information.

By default, the copied columns have the same names in the destination table that they have in the source table. If you want to give new names to the columns in the destination table, enter the new names in parentheses after the destination table name. If you enter any column names, you must enter a name for every column you are copying.

Note: To enable the copying of data between Oracle and non-Oracle databases, NUMBER columns are changed to DECIMAL columns in the destination table. Hence, if you are copying between Oracle databases, a NUMBER column with no precision will be changed to a DECIMAL(38) column. When copying between Oracle databases, you should use SQL commands (CREATE TABLE AS and INSERT) or you should ensure that your columns have a precision specified.

The USING clause specifies a query that names the source table and specifies the data that COPY copies to the destination table. You can use any form of the SQL SELECT command to select the data that the COPY command copies.

Here is an example of a COPY command that copies only two columns from the source table, and copies only those rows in which the value of DEPARTMENT_ID is 30:

```

COPY FROM HR@BOSTONDB -
REPLACE EMPCOPY2 -
USING SELECT LAST_NAME, SALARY -
FROM EMP_DETAILS_VIEW -
WHERE DEPARTMENT_ID = 30

```

You may find it easier to enter and edit long COPY commands in scripts or in the Input area of the *iSQL*Plus* Workspace rather than trying to enter them directly at the command prompt.

Controlling Treatment of the Destination Table

You control the treatment of the destination table by entering one of four control clauses—REPLACE, CREATE, INSERT, or APPEND.

The REPLACE clause names the table to be created in the destination database and specifies the following actions:

- If the destination table already exists, COPY drops the existing table and replaces it with a table containing the copied data.
- If the destination table does not already exist, COPY creates it using the copied data.

You can use the CREATE clause to avoid accidentally writing over an existing table. CREATE specifies the following actions:

- If the destination table already exists, COPY reports an error and stops.
- If the destination table does not already exist, COPY creates the table using the copied data.

Use INSERT to insert data into an existing table. INSERT specifies the following actions:

- If the destination table already exists, COPY inserts the copied data in the destination table.
- If the destination table does not already exist, COPY reports an error and stops.

Use APPEND when you want to insert data in an existing table, or create a new table if the destination table does not exist. APPEND specifies the following actions:

- If the destination table already exists, COPY inserts the copied data in the destination table.
- If the table does not already exist, COPY creates the table and then inserts the copied data in it.

Example B-1 Copying from a Remote Database to Your Local Database Using CREATE

To copy HR from a remote database into a table called EMPLOYEE_COPY on your own database, enter the following command:

Note: See your DBA for an appropriate username, password, and service name for a remote computer that contains a copy of EMPLOYEE_COPY.

```

COPY FROM HR@BOSTONDB -
CREATE EMPCOPY -

```

```
USING SELECT * FROM HR
```

```
Array fetch/bind size is 15. (arraysize is 15)
Will commit when done. (copycommit is 0)
Maximum long size is 80. (long is 80)
```

SQL*Plus then creates the table EMPLOYEE_COPY and copies the rows:

```
Table SALESMAN created.

 5 rows selected from HR@BOSTONDB.
 5 rows inserted into SALESMAN.
 5 rows committed into SALESMAN at DEFAULT HOST connection.
```

In this COPY command, the FROM clause directs COPY to connect you to the database with the specification BOSTONDB as HR.

Notice that you do not need a semicolon at the end of the command; COPY is a SQL*Plus command, not a SQL command, even though it contains a query. Since most COPY commands are longer than one line, you must use a line continuation hyphen (-), optionally preceded by a space, at the end of each line except the last.

Interpreting the Messages that COPY Displays

The first three messages displayed by COPY show the values of SET command variables that affect the COPY operation. The most important one is LONG, which limits the length of a LONG column's value. (LONG is a datatype, similar to CHAR.) If the source table contains a LONG column, COPY truncates values in that column to the length specified by the system variable LONG.

The variable ARRAYSIZE limits the number of rows that SQL*Plus fetches from the database at one time. This number of rows makes up a batch. The variable COPYCOMMIT sets the number of batches after which COPY commits changes to the database. (If you set COPYCOMMIT to zero, COPY commits changes only after all batches are copied.) For more information on SET variables, including how to change their settings, see the [SET](#) command on page 12-89.

After listing the three system variables and their values, COPY tells you if a table was dropped, created, or updated during the copy. Then COPY lists the number of rows selected, inserted, and committed.

Specifying Another User's Table

You can refer to another user's table in a COPY command by qualifying the table name with the username, just as you would in your local database, or in a query with a database link.

For example, to make a local copy of a table named DEPARTMENT owned by the username ADAMS on the database associated with the Oracle Net connect identifier BOSTONDB, you would enter

```
COPY FROM HR@BOSTONDB -
CREATE EMPLOYEE_COPY2 -
USING SELECT * FROM ADAMS.DEPARTMENT
```

Of course, you could get the same result by instructing COPY to log in to the remote database as ADAMS. You cannot do that, however, unless you know the password associated with the username ADAMS.

Copying Data between Tables on One Database

You can copy data from one table to another in a single database (local or remote). To copy between tables in your local database, specify your own username and the service name for your local database in either a FROM or a TO clause (omit the other clause):

```
COPY FROM HR@MYDATABASE -  
INSERT EMPLOYEE_COPY2 -  
USING SELECT * FROM EMPLOYEE_COPY
```

To copy between tables on a remote database, include the same username and service name in the FROM and TO clauses:

```
COPY FROM HR@BOSTONDB -  
TO HR@BOSTONDB -  
INSERT EMPLOYEE_COPY2 -  
USING SELECT * FROM EMPLOYEE_COPY
```

Obsolete SQL*Plus Commands

This appendix covers earlier versions of some SQL*Plus commands. While these older commands still function in SQL*Plus, they are not supported. It is recommended that you use the alternative SQL*Plus commands listed in the following table.

SQL*Plus Obsolete Command Alternatives

Obsolete commands are available in current releases of SQL*Plus. In future releases, they may only be available by setting the SQLPLUSCOMPATIBILITY variable. You should modify scripts using obsolete commands to use the alternative commands.

Obsolete Command	Alternative Command	Description of Alternative Command
BTITLE (old form)	BTITLE on page 12-22	Places and formats a title at the bottom of each report page or lists the current BTITLE definition.
COLUMN DEFAULT	COLUMN CLEAR on page 12-28	Resets column display attributes to default values.
DOCUMENT	REMARK on page 12-81	Places a comment which SQL*Plus does not interpret as a command.
NEWPAGE	SET NEWP[AGE] {1 n NONE} on page 12-124	Sets the number of blank lines to be printed from the top of each page to the top title.
SET BUFFER	EDIT on page 12-58	Enables the editing of the SQL*Plus command buffer, or the contents of a saved file. Use the SQL*Plus SAVE, GET, @ and START commands to create and use external files.
SET COMPATIBILITY	none	Obsolete
SET CLOSECURSOR	none	Obsolete
SET DOCUMENT	none	Obsolete
SET MAXDATA	none	Obsolete
SET SCAN	SET DEF[INE] {& c ON OFF} on page 12-105	Sets the character used to prefix substitution variables.
SET SPACE	SET COLSEP { text} on page 12-101	Sets the text to be printed between SELECTed columns.

Obsolete Command	Alternative Command	Description of Alternative Command
SET TRUNCATE	SET WRA[P] {ON OFF} on page 12-154	Controls whether SQL*Plus truncates a SELECTed row if it is too long for the current line width.
SHOW LABEL	none	Obsolete
TTITLE (old form)	TTITLE on page 12-174	Places and formats a title at the top of each report page or lists the current TTITLE definition.

BTI[TLE] text (obsolete old form)

Displays a title at the bottom of each report page.

The old form of BTITLE offers formatting features more limited than those of the new form, but provides compatibility with UFI (a predecessor of SQL*Plus). The old form defines the bottom title as an empty line followed by a line with centered text. See [TTI\[TLE\] text \(obsolete old form\)](#) on page C-4 for more details.

COL[UMN] {*column|expr*} DEF[AULT] (obsolete)

Resets the display attributes for a given column to default values.

Has the same effect as COLUMN CLEAR.

DOC[UMENT] (obsolete)

Begins a block of documentation in a script.

For information on the current method of inserting comments in a script, see the section [Placing Comments in Scripts](#) on page 5-7 and the [REMARK](#) command on page 12-81.

After you type DOCUMENT and enter [Return], SQL*Plus displays the prompt DOC> in place of SQL> until you end the documentation. The "pound" character (#) on a line by itself ends the documentation.

If you have set DOCUMENT to OFF, SQL*Plus suppresses the display of the block of documentation created by the DOCUMENT command. For more information, see [SET DOC\[UMENT\] {ON | OFF} \(obsolete\)](#) on page C-3.

NEWPAGE [1|n] (obsolete)

Advances spooled output n lines beyond the beginning of the next page.

See [SET NEWP\[AGE\] {1 | n | NONE}](#) on page 12-124 for information on the current method for advancing spooled output.

SET BUF[FER] {*buffer|SQL*} (obsolete)

Makes the specified *buffer* the current buffer.

Initially, the SQL buffer is the current buffer. SQL*Plus does not require the use of multiple buffers; the SQL buffer alone should meet your needs.

If the buffer name you enter does not exist, SET BUFFER defines (creates and names) the buffer. SQL*Plus deletes the buffer and its contents when you exit SQL*Plus.

Running a query automatically makes the SQL buffer the current buffer. To copy text from one buffer to another, use the GET and SAVE commands. To clear text from the current buffer, use CLEAR BUFFER. To clear text from the SQL buffer while using a different buffer, use CLEAR SQL.

SET COM[PATIBILITY]{V7 | V8 | NATIVE} (obsolete)

Specifies the version of the SQL language parsing syntax to use.

Set COMPATIBILITY to V7 for Oracle7, or to V8 for Oracle8 or later. COMPATIBILITY always defaults to NATIVE. Set COMPATIBILITY for the version of Oracle Database SQL syntax you want to use on the connected database, otherwise.

The default compatibility setting, NATIVE, is the most relevant setting for modern Oracle databases.

For information about SQL*Plus version compatibility settings, see [SET SQLPLUSCOMPAT\[IBILITY\] {x.y\[.z\]}](#) on page 12-140.

Example

To run a script, SALARY.SQL, created with Oracle7 SQL syntax, enter

```
SET COMPATIBILITY V7
START SALARY
```

After running the file, reset compatibility to NATIVE to run scripts created for Oracle Database 10g:

```
SET COMPATIBILITY NATIVE
```

Alternatively, you can add the command SET COMPATIBILITY V7 to the beginning of the script, and reset COMPATIBILITY to NATIVE at the end of the file.

SET CLOSECUR[SOR] {ON|OFF} (obsolete)

Sets the cursor usage behavior.

ON or OFF sets whether or not the cursor will close and reopen after each SQL statement. This feature may be useful in some circumstances to release resources in the database server.

SET DOC[UMENT] {ON|OFF} (obsolete)

Displays or suppresses blocks of documentation created by the DOCUMENT command.

SET DOCUMENT ON causes blocks of documentation to be echoed to the screen. Set DOCUMENT OFF suppresses the display of blocks of documentation.

See [DOC\[UMENT\] \(obsolete\)](#) on page C-2 for information on the DOCUMENT command.

SET MAXD[ATA] n (obsolete)

Sets the maximum total row width that SQL*Plus can process.

In SQL*Plus, the maximum row width is now unlimited. Any values you set using SET MAXDATA are ignored by SQL*Plus.

SET SCAN {ON|OFF} (obsolete)

Controls scanning for the presence of substitution variables and parameters. OFF suppresses processing of substitution variables and parameters; ON enables normal processing.

ON functions in the same manner as SET DEFINE ON.

SET SPACE {1|n} (obsolete)

Sets the number of spaces between columns in output. The maximum value of n is 10.

The SET SPACE 0 and SET COLSEP " commands have the same effect. This command is obsolete by SET COLSEP, but you can still use it for backward compatibility. You may prefer to use COLSEP because the SHOW command recognizes COLSEP and does not recognize SPACE.

SET TRU[NCATE] {ON|OFF} (obsolete)

Controls whether SQL*Plus truncates or wraps a data item that is too long for the current line width.

ON functions in the same manner as SET WRAP OFF, and vice versa. You may prefer to use WRAP because the SHOW command recognizes WRAP and does not recognize TRUNCATE.

TTI[TLE] *text* (obsolete old form)

Displays a title at the top of each report page.

The old form of TTITLE offers formatting features more limited than those of the new form, but provides compatibility with UFI (a predecessor of SQL*Plus). The old form defines the top title as a line with the date left-aligned and the page number right-aligned, followed by a line with centered text and then a blank line.

The text you enter defines the title TTITLE displays.

SQL*Plus centers text based on the size of a line as determined by SET LINESIZE. A separator character (|) begins a new line; two line separator characters in a row (||) insert a blank line. You can change the line separator character with SET HEADSEP.

You can control the formatting of page numbers in the old forms of TTITLE and BTITLE by defining a variable named "_page". The default value of _page is the formatting string "page &P4". To alter the format, you can DEFINE _page with a new formatting string as follows:

```
SET ESCAPE / SQL> DEFINE _page = 'Page /&P2'
```

This formatting string will print the word "page" with an initial capital letter and format the page number to a width of two. You can substitute any text for "page" and any number for the width. You must set escape so that SQL*Plus does not interpret the ampersand (&) as a substitution variable. See [SET ESC\[APE\] {\ | c | ON | OFF}](#) on page 12-110 for more information on setting the escape character.

SQL*Plus interprets TTITLE in the old form if a valid new-form clause does not immediately follow the command name.

If you want to use CENTER with TTITLE and put more than one word on a line, you should use the new form of TTITLE. For more information see the [TTITLE](#) command on page 12-174.

Example

To use the old form of TTITLE to set a top title with a left-aligned date and right-aligned page number on one line followed by SALES DEPARTMENT on the next line and PERSONNEL REPORT on a third line, enter

```
TTITLE 'SALES DEPARTMENT|PERSONNEL REPORT'
```

Commands Not Supported in *iSQL*Plus*

Attempting to use the following unsupported commands or command options not implemented in the *iSQL*Plus* user interface raises an SP2-0850 error message.

SQL*Plus Commands with No Context in *iSQL*Plus*

SET EDITFILE	SET SQLCONTINUE	SET TAB
SET FLUSH	SET SQLNUMBER	SET TERMOUT
SET SHIFTINOUT	SET SQLPREFIX	SET TIME
SET SHOWMODE	SET SQLPROMPT	SET TRIMOUT
SET SQLBLANKLINES	SET SUFFIX	SET TRIMSPOOL
CLEAR SCREEN	na	na

SQL*Plus Commands with Security Issues on the *iSQL*Plus* Middle Tier

GET	SPOOL
HOST	STORE

SQL Buffer Editing Commands Not Relevant in *iSQL*Plus*

APPEND	DEL	INPUT
CHANGE	EDIT	SAVE

SQL*Plus Instant Client

SQL*Plus Instant Client is a standalone product with all the functionality of SQL*Plus command-line. It connects to existing remote Oracle databases, but does not include its own database. It is easy to install and uses significantly less disk space than the full Oracle Database Client installation required to use SQL*Plus command-line.

SQL*Plus Instant Client is available on platforms that support the OCI Instant Client. See the *Oracle Call Interface Programmer's Guide* for more information on the OCI Instant Client.

To install SQL*Plus Instant Client, you need two packages:

- SQL*Plus Instant Client package.
- Either the Basic OCI Instant Client package, or the lightweight OCI Instant Client package.

Choosing the SQL*Plus Instant Client to Install

SQL*Plus Instant Client can be installed in two ways:

- Download the packages from the Oracle Technology Network (OTN).
- Copy the same files that are in the packages from an Oracle Database 10g Client Administrator installation.

Both the SQL*Plus and OCI packages must be from the same Oracle Database version, for example, 10.2.0.1.

Basic Instant Client

SQL*Plus Instant Client using the Basic OCI package works with any NLS_LANG setting supported by the Oracle Database. It supports all character sets and language settings available in the Oracle Database.

Lightweight Instant Client

SQL*Plus Instant Client using the lightweight OCI package displays error messages in English only and supports only specific character sets. It is significantly smaller than SQL*Plus Instant Client using the Basic OCI package.

Valid values for NLS_LANG parameters with the lightweight Instant Client are:

- *language* must always be American.
- *territory* can be any valid territory supported by the Oracle Database.
- *charset* is one of the following character sets:

- US7ASCII
- WE8DEC
- UTF8
- AL16UTF16
- AL32UTF8

For example:

```
NLS_LANG=AMERICAN_AMERICA.UTF8
```

See the *Oracle Database Globalization Support Guide*, and [NLS_LANG Environment Variable](#) on page 11-3 for more information about NLS settings.

Lightweight SQL*Plus Instant Client Error with Unsupported Character Set

Attempting to start SQL*Plus Instant Client with an unsupported character set will fail with the following error:

```
Error 5 initializing SQL*Plus  
NLS initialization error
```

Installing SQL*Plus Instant Client by Downloading from OTN

The OTN downloads for Linux are RPM packages. The OTN downloads for UNIX and Windows are zip files.

The SQL*Plus Instant Client package should never be installed on an ORACLE_HOME.

Installing SQL*Plus Instant Client from Linux RPM Packages

1. Download the RPM packages containing the SQL*Plus Instant Client package, and the OCI package from the OTN Instant Client page at <http://www.oracle.com/technology/tech/oci/instantclient/instantclient.html>. Both packages must be from the same version such as 10.2.0.1.
2. Use `rpm -i` for the initial install of the RPM packages, or `rpm -u` to upgrade to a newer version of the packages.
3. Configure SQL*Plus Instant Client. See [Configuring SQL*Plus Instant Client](#) on page E-4.

Installing SQL*Plus Instant Client from the UNIX or Windows Zip Files

1. Download the zip files containing the SQL*Plus Instant Client package, and the OCI package from the OTN Instant Client page at <http://www.oracle.com/technology/tech/oci/instantclient/instantclient.html>. Both packages must be from the same version such as 10.2.0.1.
2. Create a new directory, for example, `/home/instantclient10_2` on UNIX or `c:\instantclient10_2` on Windows.
3. Unzip the two packages into the new directory.
4. Configure SQL*Plus Instant Client. See [Configuring SQL*Plus Instant Client](#) on page E-4.

List of Files Required for SQL*Plus Instant Client

Tables E-1, E-2 and E-3 list the required files from each of the SQL*Plus and OCI packages. The files from only one of the OCI packages are required. Other files installed that are not listed here can be ignored, or can be removed to save disk space.

Table E-1 Instant Client Files in the SQL*Plus Package

Linux and UNIX	Windows	Description
sqlplus	sqlplus.exe	SQL*Plus executable
libsqlplus.so	not applicable	SQL*Plus library
libsqlplusic.so	orasqlplusic10.dll	SQL*Plus data shared library
glogin.sql	glogin.sql	SQL*Plus site profile

Table E-2 Instant Client Files in the Basic OCI Package

Linux and UNIX	Windows	Description
libclntsh.so.10.1	oci.dll	Client code library
libociei.so	oraociei10.dll	OCI Instant Client data shared library
libnnz10.so	orannzsbb10.dll	Security library

Table E-3 Instant Client Files in the Lightweight OCI Package

Linux and UNIX	Windows	Description
libclntsh.so.10.1	oci.dll	Client code library
libociicus.so	oraociicus10.dll	OCI Instant Client data shared library (English only)
libnnz10.so	orannzsbb10.dll	Security library

Installing SQL*Plus Instant Client from the 10g Client Release Media

1. Run the installer on the Oracle Database 10g Client Release media and choose the Administrator option.
2. Create a new directory, for example, `/home/instantclient10_2` on UNIX and Linux, or `c:\instantclient10_2` on Windows.
3. Copy the SQL*Plus Instant Client and the OCI Instant Client files to the new directory. All files must be copied from the same ORACLE_HOME.
See [Installing SQL*Plus Instant Client on UNIX or Linux](#) on page E-3 or [Installing SQL*Plus Instant Client on Windows](#) on page E-4 for a list of the files to copy.
4. Configure SQL*Plus Instant Client. See [Configuring SQL*Plus Instant Client](#) on page E-4.

Installing SQL*Plus Instant Client on UNIX or Linux

To install SQL*Plus Instant Client using the Basic OCI package on UNIX and Linux, copy the following files:

```

$ORACLE_HOME/instantclient/libociei.so
$ORACLE_HOME/lib/libclntsh.so.10.1
$ORACLE_HOME/lib/libnnz10.so
$ORACLE_HOME/lib/libsqlplus.so

```

```

$ORACLE_HOME/lib/libsqlplusic.so
$ORACLE_HOME/bin/sqlplus
$ORACLE_HOME/sqlplus/admin/glogin.sql

```

To install SQL*Plus Instant Client using the lightweight OCI package on UNIX and Linux, copy the following files:

```

$ORACLE_HOME/instantclient/light/libociicus.so
$ORACLE_HOME/lib/libclntsh.so.10.1
$ORACLE_HOME/lib/libnnz10.so
$ORACLE_HOME/lib/libsqlplus.so
$ORACLE_HOME/lib/libsqlplusic.so
$ORACLE_HOME/bin/sqlplus
$ORACLE_HOME/sqlplus/admin/glogin.sql

```

Installing SQL*Plus Instant Client on Windows

To install SQL*Plus Instant Client using the Basic OCI package on Windows, copy the following files:

```

%ORACLE_HOME%\instantclient\oraoci10.dll
%ORACLE_HOME%\bin\oci.dll
%ORACLE_HOME%\bin\orannzsbb10.dll
%ORACLE_HOME%\bin\orasqlplusic10.dll
%ORACLE_HOME%\bin\sqlplus.exe
%ORACLE_HOME%\sqlplus\admin\glogin.sql

```

To install SQL*Plus Instant Client using the lightweight OCI package on Windows, copy the following files:

```

%ORACLE_HOME%\instantclient\light\oraociicus10.dll
%ORACLE_HOME%\bin\oci.dll
%ORACLE_HOME%\bin\orannzsbb10.dll
%ORACLE_HOME%\bin\orasqlplusic10.dll
%ORACLE_HOME%\bin\sqlplus.exe
%ORACLE_HOME%\sqlplus\admin\glogin.sql

```

Configuring SQL*Plus Instant Client

The SQL*Plus Instant Client executable should only be used with the matching version of the OCI Instant Client.

Note that no ORACLE_HOME or ORACLE_SID environment variables need to be set.

Configuring SQL*Plus Instant Client on Linux (from RPMs)

The RPMs downloaded from OTN install into Oracle specific sub-directories in the */usr* file system. The sub-directory structure enables multiple versions of Instant Client to be available.

1. Add the name of the directory containing the Instant Client libraries to LD_LIBRARY_PATH. Remove any other Oracle directories.

For example, to set LD_LIBRARY_PATH on Solaris in the Bourne or Korn shells:

```

LD_LIBRARY_PATH=/usr/lib/oracle/10.2.0.1/client/lib:${LD_LIBRARY_PATH}
export LD_LIBRARY_PATH

```

2. Make sure the *sqlplus* executable installed from the RPM is the first found in your PATH. To test, enter *which sqlplus* which should return */usr/bin/sqlplus*. If not, remove any other Oracle directories from PATH, or put */usr/bin* before other

SQL*Plus executables in PATH, or use an absolute or relative path to start SQL*Plus.

For example, to set PATH in the bash shell:

```
PATH=/usr/bin:${PATH}
export PATH
```

If you install multiple versions of SQL*Plus, you may need to change the symbolic link `/usr/bin/sqlplus` to the version of SQL*Plus matching the libraries in `LD_LIBRARY_PATH`. For 10.2.0.1, `/usr/bin/sqlplus` is a symbolic link to the SQL*Plus binary at `/usr/lib/oracle/10.2.0.1/client/bin/sqlplus`.

3. Set `SQLPATH` to the directory containing `glogin.sql`.

For example:

```
SQLPATH=/usr/lib/oracle/10.2.0.1/client/lib:${SQLPATH}
export SQLPATH
```

4. Set Oracle globalization variables required for your locale. A default locale will be assumed if no variables are set. See the *Oracle Database Globalization Support Guide* for more information.

For example:

```
NLS_LANG=AMERICAN_AMERICA.UTF8
export NLS_LANG
```

Configuring SQL*Plus Instant Client on Linux (from Client Media or Zip File) and UNIX

1. Add the name of the directory containing the Instant Client files to the appropriate shared library path `LD_LIBRARY_PATH`, `LIBPATH` or `SHLIB_PATH`. Remove any other Oracle directories.

For example on Solaris in the Bourne or Korn shells:

```
LD_LIBRARY_PATH=/home/instantclient10_1:${LD_LIBRARY_PATH}
export LD_LIBRARY_PATH
```

2. Add the directory containing the Instant Client files to the `PATH` environment variable. If it is not set, then an absolute or relative path must be used to start SQL*Plus. Remove any other Oracle directories from `PATH`.

For example:

```
PATH=/home/instantclient10_1:${PATH}
export PATH
```

3. Set `SQLPATH` to the directory containing the Instant Client files so `glogin.sql` can be found.

For example:

```
SQLPATH=/home/instantclient10_1:${SQLPATH}
export SQLPATH
```

4. Set Oracle globalization variables required for your locale. A default locale will be assumed if no variables are set. See the *Oracle Database Globalization Support Guide* for more information.

For example:

```
NLS_LANG=AMERICAN_AMERICA.UTF8
export NLS_LANG
```

Configuring SQL*Plus Instant Client on Windows

The environment may be configured using SET commands in a Windows command prompt or made permanent by setting Environment Variables in System Properties.

For example, to set environment variables in Windows 2000 using System Properties, open System from the Control Panel, click the Advanced tab and then click Environment Variables.

1. Add the directory containing the Instant Client files to the PATH system environment variable. Remove any other Oracle directories from PATH.
For example, add `c:\instantclient10_2` to the beginning of PATH.
2. Set the user environment variable SQLPATH to the directory containing the Instant Client files so `glogin.sql` is found.
For example, create a user variable SQLPATH set to `c:\instantclient`.
3. Set Oracle globalization variables required for your locale. A default locale will be assumed if no variables are set. See the *Oracle Database Globalization Support Guide* for more information.

For example, to set NLS_LANG for a Japanese environment, create a user environment variable NLS_LANG set to JAPANESE_JAPAN.JA16EUC.

If you have installed the lightweight Instant Client, see [Lightweight Instant Client](#) on page E-1 for information about supported NLS_LANG settings.

Connecting to a Database with SQL*Plus Instant Client

SQL*Plus Instant Client is always 'remote' from any database server. To connect to a database you must specify the database using an Oracle Net connection identifier.

An example using an Easy Connection identifier to connect to the HR schema in the MYDB database running on *mymachine* is:

```
sqlplus hr/your_password@//mymachine.mydomain:port/MYDB
```

Alternatively you can use a Net Service Name:

```
sqlplus hr/your_password@MYDB
```

Net Service Names can be stored in a number of places, including LDAP. The use of LDAP is recommended to take advantage of the new features of Oracle Database 10g. See the *Oracle Database Net Services Reference* for more information.

If you want to use Net Service Names configured in a local Oracle Net *tnsnames.ora* file, then set the environment variable TNS_ADMIN to the directory containing the *tnsnames.ora* file. For example, on UNIX, if your *tnsnames.ora* file is in */home/user1* and it defines the Net Service Name MYDB2:

```
TNS_ADMIN=/home/user1
export TNS_ADMIN
sqlplus hr@MYDB2
```

If TNS_ADMIN is not set, then an operating system dependent set of directories is examined to find *tnsnames.ora*. This search path includes looking in the directory specified by the ORACLE_HOME environment variable for *network/admin/tnsnames.ora*. This is the only reason to set the ORACLE_HOME environment variable for SQL*Plus Instant Client. If ORACLE_HOME is set when running Instant Client applications, it must be set to a directory that exists.

This example assumes the ORACLE_HOME environment variable is set, and the \$ORACLE_HOME/network/admin/tnsnames.ora or %ORACLE_HOME%\network\admin\tnsnames.ora file defines the Net Service Name MYDB3:

```
sqlplus hr@MYDB3
```

The TWO_TASK (on UNIX) or LOCAL (on Windows) environment variable can be set to a connection identifier. This removes the need to explicitly enter the connection identifier whenever a connection is made in SQL*Plus or SQL*Plus Instant Client. This UNIX example connects to the database known as MYDB4:

```
TNS_ADMIN=/home/user1
export TNS_ADMIN
TWO_TASK=MYDB4
export TWO_TASK
sqlplus hr
```

On Windows, TNS_ADMIN and LOCAL may be set in the System Properties. See [Configuring SQL*Plus Instant Client on Windows](#) on page E-6.

AS SYSDBA or AS SYSOPER Connections with SQL*Plus Instant Client

To connect AS SYSDBA or AS SYSOPER to perform DBA tasks, you need to set up an Oracle password file on the database server using the database's *orapwd* utility. Once this is configured, your SQL*Plus Instant Client connection string might look something like:

```
sqlplus sys@MYDB AS SYSDBA
```

See the *Oracle Database Administrator's Guide* for information on Oracle password files.

Uninstalling Instant Client

The SQL*Plus Instant Client package can be removed separately from the OCI Instant Client. After uninstalling the SQL*Plus Instant Client package, the remaining OCI Instant Client libraries enable custom written OCI programs or third party database utilities to connect to a database.

Uninstalling SQL*Plus Instant Client

1. For installations on Linux from RPM packages, use *rpm -e* only on the SQL*Plus Instant Client package

or

For installations on UNIX and Windows, and installations on Linux from the Client Release media, manually remove the following SQL*Plus specific files:

Table E-4 Instant Client Files in the SQL*Plus Package

UNIX	Windows	Description
sqlplus	sqlplus.exe	SQL*Plus executable
glogin.sql	glogin.sql	SQL*Plus site profile
libsqlplus.so	not applicable	SQL*Plus library
libsqlplusic.so	orasqlplusic10.dll	SQL*Plus data shared library

2. Reset environment variables and remove *tnsnames.ora* if necessary.

Uninstalling the Complete Instant Client

1. For installations on Linux from RPM packages, use *rpm -qa* to find the SQL*Plus Instant Client and Basic OCI package names and run *rpm -e* to remove them

or

For installations on UNIX and Windows, and installations on Linux from the Client Release media, manually delete the directory containing the SQL*Plus executable, Oracle libraries and *glogin.sql*.

See [Installing SQL*Plus Instant Client from the 10g Client Release Media](#) on page E-3 for a list of the files you copied to the directory.

2. Reset environment variables such as PATH, SQLPATH, LD_LIBRARY_PATH and TNS_ADMIN.
3. Remove *tnsnames.ora* if necessary.

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