

SQL*Plus

User's Guide and Reference

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SQL*Plus User's Guide and Reference, Release 9.2

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SQL*Plus User's Guide and Reference, Release 9.2

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Preface

The SQL*Plus (pronounced “sequel plus”) *User’s Guide and Reference* introduces the SQL*Plus program and its uses. It also provides a detailed description of each SQL*Plus command.

This preface contains these topics:

- [Intended Audience](#)
- [Documentation Accessibility](#)
- [Documentation Structure](#)
- [Related Documentation](#)
- [Conventions](#)

Intended Audience

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

- Enter, edit, store, retrieve, and run SQL commands and PL/SQL blocks
- Format, calculate on, store, print and create web output of query results
- List column definitions for any table
- Send messages to and accept responses from an end user
- Perform database administration

This document requires a basic understanding of the SQL language. If you do not have any familiarity with this database tool, refer to the *Oracle9i SQL Reference*. If you plan to use the PL/SQL database language in conjunction with SQL*Plus, refer to the *PL/SQL User's Guide and Reference* for information on using PL/SQL.

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Documentation Structure

This document contains:

SQL*Plus Quick Start

A brief guide to get you up and running after installation.

PART I, SQL*Plus Getting Started

Provides an overview of SQL*Plus, describes the command-line and *i*SQL*Plus user interfaces, provides configuration information and information you need to log in and run SQL*Plus

Chapter 1, "SQL*Plus Overview"

An overview of SQL*Plus, with instructions on using this guide, and information on what you need to run SQL*Plus.

Provides introductory information about *i*SQL*Plus architecture and the *i*SQL*Plus browser-based interface to SQL*Plus.

Chapter 2, "SQL*Plus User Interface"

Describes the command-line and *i*SQL*Plus user interfaces, and the *i*SQL*Plus Extension for Windows.

Chapter 3, "Configuring SQL*Plus"

Explains how to configure your SQL*Plus command-line and *i*SQL*Plus environments.

Chapter 4, "Starting SQL*Plus"

Explains how to start, connect to an Oracle database, access the command-line and online help and exit SQL*Plus.

PART II, Using SQL*Plus

Contains SQL*Plus user guide and tutorial content, scripts writing information, and SQL*Plus tuning, security, database administration and globalization information.

Chapter 5, "SQL*Plus Basics"

Explains how to enter and execute commands. You learn by following step-by-step examples using sample tables.

Chapter 6, "Using Scripts in SQL*Plus"

Contains further examples to help you learn to write and edit scripts containing SQL*Plus, SQL and PL/SQL statements and commands.

Chapter 7, "Formatting SQL*Plus Reports"

Uses examples to explain how you can format your query results to produce a finished report. It does not discuss HTML output.

Chapter 8, "Generating HTML Reports from SQL*Plus"

Explains how to generate a HTML report containing your query results.

Chapter 9, "Tuning SQL*Plus"

Explains how to obtain and use statistics and other mechanisms to obtain optimal performance from SQL*Plus.

Chapter 10, "SQL*Plus Security"

Explains how to restrict access to databases, and to certain SQL*Plus and SQL commands.

Chapter 11, "Database Administration with SQL*Plus"

Explains basic database administration features in SQL*Plus for Database Administrators (DBAs).

Chapter 12, "SQL*Plus Globalization Support"

Explains how to configure globalization support in command-lineSQL*Plus and iSQL*Plus user interfaces.

PART III, SQL*Plus Reference

Contains SQL*Plus Command Reference and Error Messages.

Chapter 13, "SQL*Plus Command Reference"

Provides a summary of SQL*Plus commands and detailed descriptions of each SQL*Plus command in alphabetical order.

Chapter 14, "SQL*Plus Error Messages"

Lists error messages generated by SQL*Plus, iSQL*Plus, and the COPY command. It provides likely causes and appropriate actions for recovery.

PART IV, SQL*Plus Appendixes

Contains SQL*Plus Appendixes.

Appendix A, "SQL*Plus Limits"

Lists the maximum values for elements of SQL*Plus.

Appendix B, "SQL*Plus COPY Command"

Provides syntax and usage information for the COPY command.

Appendix C, "Obsolete SQL*Plus Commands"

Provides information on Obsolete SQL*Plus commands.

Appendix D, "Commands Not Supported in iSQL*Plus"

Lists SQL*Plus commands that are not supported in iSQL*Plus.

Glossary

Defines technical terms associated with Oracle and SQL*Plus.

Related Documentation

For more information, see these Oracle resources:

- *SQL*Plus Quick Reference*
- *PL/SQL User's Guide and Reference*
- *Oracle9i SQL Reference*
- *Oracle9i Database Concepts*
- *Oracle9i Database Administrator's Guide*
- *Oracle9i User-Managed Backup and Recovery Guide*
- *Oracle9i Application Developer's Guide - Fundamentals*
- *Oracle9i XML Database Developer's Guide - Oracle XML DB*
- *Oracle9i Database Globalization Support Guide*
- *Oracle9i Heterogeneous Connectivity Administrator's Guide*
- *Oracle9i Replication*
- *Oracle9i Database Utilities*

- *Oracle9i Database Error Messages*
- *Oracle9i Database Migration*
- *Oracle9i Database Reference*
- *Oracle9i Database Performance Tuning Guide and Reference*
- *Oracle9i Real Application Clusters Concepts*
- *Oracle9i Net Services Administrator's Guide*
- *Oracle Call Interface Programmer's Guide*
- *Pro*COBOL Precompiler Programmer's Guide*
- *Pro*C/C++ Precompiler Programmer's Guide*
- Oracle installation and user's manual(s) provided for your operating system

Many of the examples in this book use the sample schemas of the seed database, which is installed by default when you install Oracle. Refer to *Oracle9i Sample Schemas* for information on how these schemas were created and how you can use them yourself.

In North America, printed documentation is available for sale in the Oracle Store at
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Whitepapers, sample code, frequently asked questions and other useful information are regularly posted to the SQL*Plus section on OTN at

http://otn.oracle.com/tech/sql_plus/

Conventions

This section describes the conventions used in the text and code examples of this documentation set. It describes:

- [Conventions in Text](#)
- [Conventions in Code Examples](#)
- [Conventions for Windows Operating Systems](#)

Conventions in Text

We use various conventions in text to help you more quickly identify special terms. The following table describes those conventions and provides examples of their use.

Convention	Meaning	Example
Bold	Bold typeface indicates terms that are defined in the text or terms that appear in a glossary, or both.	When you specify this clause, you create an index-organized table .
<i>Italics</i>	Italic typeface indicates book titles or emphasis.	<i>Oracle9i Database Concepts</i> Ensure that the recovery catalog and target database do <i>not</i> reside on the same disk.
UPPERCASE monospace (fixed-width font)	Uppercase monospace typeface indicates elements supplied by the system. Such elements include parameters, privileges, datatypes, RMAN keywords, SQL keywords, SQL*Plus or utility commands, packages and methods, as well as system-supplied column names, database objects and structures, usernames, and roles.	You can specify this clause only for a NUMBER column. You can back up the database by using the BACKUP command. Query the TABLE_NAME column in the USER_TABLES data dictionary view. Use the DBMS_STATS.GENERATE_STATS procedure.

Convention	Meaning	Example
lowercase monospace (fixed-width font)	<p>Lowercase monospace typeface indicates executables, filenames, directory names, and sample user-supplied elements. Such elements include computer and database names, net service names, and connect identifiers, as well as user-supplied database objects and structures, column names, packages and classes, usernames and roles, program units, and parameter values.</p> <p>Note: Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.</p>	<p>Enter <code>sqlplus</code> to open SQL*Plus.</p> <p>The password is specified in the <code>orapwd</code> file.</p> <p>Back up the datafiles and control files in the <code>/disk1/oracle/dbs</code> directory.</p> <p>The <code>department_id</code>, <code>department_name</code>, and <code>location_id</code> columns are in the <code>hr.departments</code> table.</p> <p>Set the <code>QUERY_REWRITE_ENABLED</code> initialization parameter to <code>true</code>.</p> <p>Connect as <code>oe</code> user.</p> <p>The <code>JRepUtil</code> class implements these methods.</p>
lowercase monospace (fixed-width font) italic	Lowercase monospace italic font represents placeholders or variables.	<p>You can specify the <i>parallel clause</i>.</p> <p>Run <code>Uold_release.SQL</code> where <code>old_release</code> refers to the release you installed prior to upgrading.</p>

Conventions in Code Examples

Code examples illustrate SQL, PL/SQL, SQL*Plus, or other command-line statements. They are displayed in a monospace (fixed-width) font and separated from normal text as shown in this example:

```
SELECT username FROM dba_users WHERE username = 'MIGRATE';
```

Code examples illustrate SQL, PL/SQL, SQL*Plus, or other command-line statements. If users are expected to type them into the system, they are identified by the keyboard icon shown in the margin following. They are displayed in a monospace (fixed-width) font and separated from normal text as shown in this example:



```
SELECT username FROM dba_users WHERE username = 'MIGRATE';
```

Similarly, output from an example is identified by a computer screen icon in the margin as shown in the margin following.



```
PAGESIZE 24
```

Where both icons occur together, it implies interactive entry and output.



1

```
1 * SELECT LAST_NAME, SALARY
```

```
APPEND , COMMISSION_PCT;
```

The following table describes typographic conventions used in code examples and provides examples of their use.

Convention	Meaning	Example
[]	Brackets enclose one or more optional items. Do not enter the brackets.	DECIMAL (<i>digits</i> [, <i>precision</i>])
{ }	Braces enclose two or more items, one of which is required. Do not enter the braces.	{ENABLE DISABLE}
	A vertical bar represents a choice of two or more options within brackets or braces. Enter one of the options. Do not enter the vertical bar.	{ENABLE DISABLE} [COMPRESS NOCOMPRESS]
...	Horizontal ellipsis points indicate either:	
	<ul style="list-style-type: none">▪ That we have omitted parts of the code that are not directly related to the example▪ That you can repeat a portion of the code	CREATE TABLE ... AS <i>subquery</i> ;
.	Vertical ellipsis points indicate that we have omitted several lines of code not directly related to the example.	SELECT <i>col1</i> , <i>col2</i> , ... , <i>coln</i> FROM employees;
.		
.		
Other notation	You must enter symbols other than brackets, braces, vertical bars, and ellipsis points as shown.	acctbal NUMBER(11,2); acct CONSTANT NUMBER(4) := 3;
<i>Italics</i>	Italicized text indicates placeholders or variables for which you must supply particular values.	CONNECT SYSTEM/ <i>system_password</i> DB_NAME = <i>database_name</i>
UPPERCASE	Uppercase typeface indicates elements supplied by the system. We show these terms in uppercase in order to distinguish them from terms you define. Unless terms appear in brackets, enter them in the order and with the spelling shown. However, because these terms are not case sensitive, you can enter them in lowercase.	SELECT last_name, employee_id FROM employees; SELECT * FROM USER_TABLES; DROP TABLE hr.employees;

Convention	Meaning	Example
lowercase	<p>Lowercase typeface indicates programmatic elements that you supply. For example, lowercase indicates names of tables, columns, or files.</p> <p>Note: Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.</p>	<pre>SELECT last_name, employee_id FROM employees; sqlplus hr/your_password CREATE USER mjones IDENTIFIED BY ty3MU9;</pre>

Conventions for Windows Operating Systems

The following table describes conventions for Windows operating systems and provides examples of their use.

Convention	Meaning	Example
Choose Start >	How to start a program.	To start the Oracle Database Configuration Assistant, choose Start > Programs > Oracle - <i>HOME_NAME</i> > Configuration and Migration Tools > Database Configuration Assistant.
File and directory names	File and directory names are not case sensitive. The following special characters are not allowed: left angle bracket (<), right angle bracket (>), colon (:), double quotation marks ("), slash (/), pipe (), and dash (-). The special character backslash (\) is treated as an element separator, even when it appears in quotes. If the file name begins with \\, then Windows assumes it uses the Universal Naming Convention.	c:\winnt\"system32 is the same as C:\WINNT\SYSTEM32
C:\>	Represents the Windows command prompt of the current hard disk drive. The escape character in a command prompt is the caret (^). Your prompt reflects the subdirectory in which you are working. Referred to as the <i>command prompt</i> in this manual.	C:\oracle\oradata>

Convention	Meaning	Example
	<p>The backslash (\) special character is sometimes required as an escape character for the double quotation mark ("") special character at the Windows command prompt. Parentheses and the single quotation mark ('') do not require an escape character. Refer to your Windows operating system documentation for more information on escape and special characters.</p>	<pre>C:\>exp scott/tiger TABLES=emp QUERY=\ "WHERE job='SALESMAN' and sal<1600\"</pre>
<i>HOME_NAME</i>	<p>Represents the Oracle home name. The home name can be up to 16 alphanumeric characters. The only special character allowed in the home name is the underscore.</p>	<pre>C:\> net start Oracle<i>HOME_NAME</i>TNSListener</pre>
<i>ORACLE_HOME</i> and <i>ORACLE_BASE</i>	<p>In releases prior to Oracle<i>8i</i> release 8.1.3, when you installed Oracle components, all subdirectories were located under a top level <i>ORACLE_HOME</i> directory that by default used one of the following names:</p>	<p>Go to the <i>ORACLE_BASE\ORACLE_HOME\rdbms\admin</i> directory.</p>
	<ul style="list-style-type: none"> ■ C:\orant for Windows NT ■ C:\orawin98 for Windows 98 	
	<p>This release complies with Optimal Flexible Architecture (OFA) guidelines. All subdirectories are not under a top level <i>ORACLE_HOME</i> directory. There is a top level directory called <i>ORACLE_BASE</i> that by default is C:\oracle. If you install Oracle<i>9i</i> release 1 (9.0.1) on a computer with no other Oracle software installed, then the default setting for the first Oracle home directory is C:\oracle\ora90. The Oracle home directory is located directly under <i>ORACLE_BASE</i>.</p>	
	<p>All directory path examples in this guide follow OFA conventions.</p>	
	<p>Refer to <i>Oracle9i Database Getting Started for Windows</i> for additional information about OFA compliances and for information about installing Oracle products in non-OFA compliant directories.</p>	

What's New in SQL*Plus?

This section describes new features of SQL*Plus Release 9.2 and provides pointers to additional information. New features information from previous releases is also retained to help those users migrating to the current release.

The following sections describe the new features in SQL*Plus:

- [New Features in SQL*Plus 9.2](#)
- [New Features in iSQL*Plus 9.2](#)
- [Upgrading iSQL*Plus Server from 9.0.1 to 9.2](#)
- [New Features in SQL*Plus 9.0.1](#)

New Features in SQL*Plus 9.2

SQL*Plus Release 9.2.0 is a superset of SQL*Plus 9.0.1. This section describes new features introduced in this release of SQL*Plus.

XMLType Support

There is additional support for XMLType in SQL*Plus. The DESCRIBE command now provides details about XMLType columns and usage in functions and procedures. The maximum size of a retrieved XMLType column is determined by SET LONG, and SET LONGCHUNKSIZE determines the size of the increments or chunks SQL*Plus uses to retrieve XMLType data.

See Also:

- ["DESCRIBE" on page 13-53](#)
- ["SET LONG {80 | n}" on page 13-112](#)
- ["SET LONGC\[HUNKSIZE\] {80 | n}" on page 13-112](#)
- ["Formatting Datatypes" on page 7-5.](#)

SQLPLUS -L Argument

There is a new command-line argument for the SQLPLUS command, SQLPLUS -L which 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. It is also useful for situations where you do not want to be reprompted for connection details if the Server is not running. This option is not available with the SQL*Plus Windows graphical user interface.

See Also: ["SQL*Plus Command Summary" on page 13-2.](#)

_CONNECT_IDENTIFIER DEFINE Variable

There is a new DEFINE variable _CONNECT_IDENTIFIER, which contains the SID as supplied by the user to make a connection where it is available. This allows the connection information to be accessed like any other DEFINE variable. For example, it could be used in TTITLE, in '&' substitution variables, or as your SQL*Plus command-line prompt by using the SET SQLPROMPT command. For example, to change your SQL*Plus prompt to display your username and SID, enter:

```
SET SQLPROMPT '&_CONNECT_IDENTIFIER > '
```

You can use the DEFINE command to view the _CONNECT_IDENTIFIER definition in the same way as you view other DEFINE definitions, using the DEFINE command with no arguments, or with the specific argument you wish to display, for example:

```
DEFINE
```

or

```
DEFINE _CONNECT_IDENTIFIER
```

You can use UNDEFINE to remove the _CONNECT_IDENTIFIER definition and make it unavailable.

See Also: ["Defining User Variables" on page 6-17.](#)

Cause/Action Text for SP2 Error Messages

There is new Cause and Action documentation for SP2- error messages. The UNIX *oerr* script now recognizes SP2- error prefixes to display the Cause and Action text.

See Also: [Chapter 14, "SQL*Plus Error Messages"](#)

@URL Support

The @URL syntax is now supported on all platforms. Use '@URL' to run a script on any platform, not just Windows.

See Also: ["@ \("at" sign\)", "@@ \(double "at" sign\)" and "START" in Chapter 13, "SQL*Plus Command Reference".](#)

New Features in *iSQL*Plus* 9.2

There are changes to the functionality of the *iSQL*Plus* user interface, and to its look and feel.

UNIX Support

The *iSQL*Plus* Server is supported on UNIX platforms.

Set System Variables

There is a new *iSQL*Plus* System Variables screen. This screen provides a graphical interface to the system variables applicable to *iSQL*Plus*. It allows you to view current settings, and to change one or more settings from a single screen. The default system variable settings are used each time you start a new *iSQL*Plus* session. You can also use the SET command in the Work screen if you prefer.

See Also: ["Saving Changes to the Database Automatically"](#) on page 5-11.

History Screen

There is a new *iSQL*Plus* History screen. This screen allows you to reload one or more scripts that you have previously executed in the same session.

A History entry is created each time you execute a script. The number of entries listed is definable through the Preferences screen. Each *iSQL*Plus* session has its own history list which is cleared when that session ends.

See Also: ["iSQL*Plus History Screen"](#) on page 2-6.

New Session

There is a new icon called New Session in the *iSQL*Plus* user interface. The New Session icon starts a new *iSQL*Plus* session in a separate web browser window. You can log in to the new session as the same user or as any other valid user.

See Also: ["iSQL*Plus Navigation"](#) on page 2-3.

Cancel Script

There is a new Cancel button on the *iSQL*Plus* Work screen. The Cancel button interrupts the script currently running in your *iSQL*Plus* session.

See Also: ["iSQL*Plus Work Screen"](#) on page 2-5.

iSQL*Plus DBA Login

The *iSQL*Plus* DBA Login screen contains a Privilege dropdown list to select either SYSDBA or SYSOPER privileged login to perform system administration tasks. This field is not available through the standard *iSQL*Plus* Login screen. Use the *iSQL*Plus* DBA URL to access the DBA Login screen.

Once logged in with DBA privileges, the *iSQL*Plus* screens have the *iSQL*Plus* DBA logo to clearly distinguish this administrative session from standard *iSQL*Plus* sessions.

See Also: "iSQL*Plus DBA Login Screen" on page 2-10.

iSQL*Plus Extension for Windows

The *iSQL*Plus* Extension for Windows provides a context menu to load or execute local SQL scripts in *iSQL*Plus*. The *iSQL*Plus* Extension for Windows works with .SQL files and is activated by right clicking a .SQL file in Windows Explorer.

After you have configured an *iSQL*Plus* Server, you can use the context menu to:

- Run or load local scripts accessible from your workstation
- Select the server to use from a list of configured *iSQL*Plus* Servers
- Choose the double click file association for .SQL files
- Choose the language to use from a list of configured languages

Language Support in iSQL*Plus Extension for Windows

On Windows XP, Windows 2000 and Windows NT, the *iSQL*Plus* Extension for Windows supports the following languages:

Brazilian Portuguese
English
French/Canadian French
German
Italian
Japanese
Korean
Simplified Chinese
Spanish/LA Spanish
Traditional Chinese

On Windows 98, the *iSQL*Plus* Extension for Windows is only available in English.

See Also: "iSQL*Plus Extension for Windows" on page 2-16.

Upgrading iSQL*Plus Server from 9.0.1 to 9.2

There are some changes between iSQL*Plus in Release 9.0.1 and 9.2.

iSQL*Plus URL

The default Oracle HTTP Server installation now specifies a port number. If the port number was not recorded during installation, check the *Port* and *Listen* directives in *httpd.conf*. On Windows, *httpd.conf* is located in %ORACLE_HOME%\Apache\Apache\conf . On UNIX, *httpd.conf* is located in ORACLE_HOME/Apache/bin/conf on UNIX.

The URL for iSQL*Plus Release 9.2 is

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

You must ensure that any HTML links to iSQL*Plus are updated to the new URL.

iSQL*Plus Configuration File

The format of the iSQL*Plus configuration file, *isqlplus.conf*, has changed. Any user customizations can be manually merged into the default iSQL*Plus Release 9.2 configuration file. On Windows, *isqlplus.conf* is located in %ORACLE_HOME%\sqlplus\admin . On UNIX, *isqlplus.conf* is located in \$ORACLE_HOME/sqlplus/admin.

iSQL*Plus Release 9.0.1 Parameters

There were two parameters that could be configured in iSQL*Plus Release 9.0.1.

- `iSQLPlusTimeOut` This parameter has been removed. Expiry is now always enabled.
- `iSQLPlusTimeOutInterval` The new default value is 30 minutes. This directive is now a parameter to the `FastCgiServer` directive.

iSQL*Plus Release 9.2 Parameters

There are several new parameters for sizing and tuning iSQL*Plus Release 9.2. You can edit the *isqlplus.conf* configuration file directly to change settings for iSQL*Plus Server parameter settings:

- `iSQLPlusNumberOfThreads`
- `iSQLPlusLogLevel`
- `iSQLPlusTimeOutInterval`

- `iSQLPlusHashTableSize`
- `iSQLPlusConnectIdList`
- `-idle-timeout`

For information about these parameters, see ["Configuring the Middle Tier: iSQL*Plus Server" on page 3-7](#).

Security

HTTP Server authentication usernames for DBA connections need to be added to the *iSQL*Plus* 9.2 password file *iplusdba.pw* using the *htpasswd* utility.

If you had HTTP Authentication for user connections enabled in 9.0.1, verify the new *isqlplus.conf* format is followed and add users to the specified password file.

You may wish to allow access only to a specified list of database servers by enabling `iSQLPlusConnectIdList`

For more information, see [Chapter 10, "SQL*Plus Security"](#).

Style Sheet

The style sheet *iplus.css* has changed. It is recommended that you use the default 9.2 style sheet as the basis for *iSQL*Plus* Release 9.2 customization.

New Features in SQL*Plus 9.0.1

SQLPLUS Command-line Switches

The version and usage command-line switches have been standardized as:

```
-V[ERSION]  
-H[HELP]
```

Invalid options give the usage message corresponding to -HELP. The "-" and "-?" options have been obsoleted.

iSQL*Plus

*iSQL*Plus* is a browser-based interface to SQL*Plus. *iSQL*Plus* is only available on the Microsoft Windows operating system in this release.

START, @, @@

New commands were added to read and execute a SQL script from a Uniform Resource Locator (URL). The ability to read and execute a script from a URL is available in the @, @@ and START commands. The syntax is:

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

"url" specifies a script to run on the specified web server. SQL*Plus supports HTTP, FTP and gopher protocols. Pass variable values to the script in the usual way, for example:

```
http://machine_name.domain:port/script.sql value1 value2
```

Note: This feature is only available on Microsoft Windows.

SET APPINFO

The default for SET APPINFO is now OFF. This allows some privileged DBA operations to be executed when the database is not fully configured. Add SET APPINFO ON to *glogin.sql* to get the previous behavior.

SET SQLPLUSCOMPATIBILITY

There is a new SET command, SET SQLPLUSCOMPAT[IBILITY] {x.y[.z]}. It sets the behavior of the VARIABLE command to that of the version specified by SQLPLUSCOMPATIBILITY.

In later releases of SQL*Plus, SQLPLUSCOMPATIBILITY may support features other than VARIABLE. The SQLPLUSCOMPATIBILITY command can be used to help keep the expected behavior of a release.

HR Sample Schema

The SQL*Plus documentation uses a new set of sample schemas for all examples. See the *Oracle9i Sample Schemas* guide for details on access, implementation and use of the sample schemas.

SQL*Plus Quick Start

This chapter contains single pages of instructions to get you up and running after you have installed SQL*Plus.

- [iSQL*Plus Quick Start](#)
- [SQL*Plus Command-line Quick Start for Windows](#)
- [SQL*Plus Command-line Quick Start for UNIX](#)

Some Resources

Here are some resources you might find useful when working with iSQL*Plus:

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

iSQL*Plus Quick Start

Do the following steps to start iSQL*Plus:

1. Connect to the Internet or your intranet, and start your web browser.
2. Enter your Oracle9*i* HTTP Server URL, followed by `isqlplus`, in your web browser's Location or Address field. The iSQL*Plus URL looks like this:

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

If you do not know the Oracle9*i* HTTP Server URL, ask your System Administrator.

3. Press Enter to go to the URL. The iSQL*Plus Login screen is displayed in your web browser.
4. Enter your Oracle9*i* username and password in the Username and Password fields. If you do not know your Oracle9*i* username and password, ask your Database Administrator.
5. Leave the Connection Identifier field blank to connect to the default database. Enter the Oracle Net database alias to connect to a database other than the default. If restricted database access has been configured, the Connection Identifier field will be a dropdown list of available databases you can select.
6. Click Login to connect to the database. The iSQL*Plus Work screen is displayed in your web browser.

Now you can start entering and executing SQL, PL/SQL and SQL*Plus statements and commands in the Work screen Input area.

SQL*Plus Command-line Quick Start for Windows

Do the following steps to start SQL*Plus and connect to the default database:

1. Open a Windows command prompt.
2. At the command-line prompt, enter the SQL*Plus command in the form:

```
c:\> sqlplus
```

3. When prompted, enter your Oracle9*i* username and password. If you do not know your Oracle9*i* username and password, ask your Database Administrator.
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.

Do the following to start SQL*Plus and connect to a specified database other than the default:

1. Start SQL*Plus and connect to the default database.
2. Use the CONNECT command to specify the Oracle Net database alias (*@connect_identifier*) of the database you want to connect to. To do this enter the CONNECT command in the form:

```
SQL> connect username/password@connect_identifier
```

To hide your password, enter the CONNECT command in the form:

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

You will be prompted to enter your password.

3. Alternatively, to start SQL*Plus connected to a database other than the default, enter the SQL*Plus command in the form:

```
c:\> sqlplus username/password@connect_identifier
```

To hide your password, enter the SQL*Plus command in the form:

```
c:\> sqlplus username@connect_identifier
```

You will be prompted to enter your password.

SQL*Plus Command-line Quick Start for UNIX

Do the following steps to start SQL*Plus and connect to the default database:

1. Open a UNIX terminal.
2. At the command-line prompt, enter the SQL*Plus command in the form:

```
$> sqlplus
```

3. When prompted, enter your Oracle9*i* username and password. If you do not know your Oracle9*i* username and password, ask your Database Administrator.
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.

Do the following to start SQL*Plus and connect to a specified database other than the default:

1. Start SQL*Plus and connect to the default database.
2. Use the CONNECT command to specify the Oracle Net database alias (@*connect_identifier*) of the database you want to connect to. To do this enter the CONNECT command in the form:

```
SQL> connect username/password@connect_identifier
```

To hide your password, enter the CONNECT command in the form:

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

You will be prompted to enter your password.

3. Alternatively, to start SQL*Plus connected to a database other than the default, enter the SQL*Plus command in the form:

```
$> sqlplus username/password@connect_identifier
```

To hide your password, enter the SQL*Plus command in the form:

```
$> sqlplus username@connect_identifier
```

You will be prompted to enter your password.

Part I

SQL*Plus Getting Started

This section provides you with the information you need to get started with SQL*Plus. It provides an overview of SQL*Plus, describes the command-line and iSQL*Plus user interfaces, provides configuration information and information you need to log in and run SQL*Plus.

The following chapters are covered in this section:

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

SQL*Plus Overview

This chapter introduces you to SQL*Plus, covering the following topics:

- [What is SQL*Plus](#)
- [SQL*Plus Installation](#)
- [Who Can Use SQL*Plus](#)
- [How Can I Learn SQL*Plus](#)
- [How to Use the SQL*Plus Guide](#)
- [Oracle9i Sample Tables and SQL*Plus](#)

What is SQL*Plus

SQL*Plus is an interactive and batch query tool that is installed with every Oracle Server or Client installation. It has a command-line user interface, and more recently, a web-based user interface called *iSQL*Plus*.

On Windows platforms, context menu options accessed through the right mouse button enable local files to be sent to the *iSQL*Plus* user interface.

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

- enter SQL*Plus commands to configure the SQL*Plus environment
- enter, edit, store, retrieve, and run SQL commands and PL/SQL blocks
- format, perform calculations on, store, and print from query results
- interact with an end user
- startup and shutdown a database
- connect to a database
- define variables
- capture errors
- list column definitions for any table
- 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 in combination with server side CGI scripts, or using the dynamic reporting capability of *iSQL*Plus* to run a script from a web page.

For example, to describe a database object using *iSQL*Plus*, enter



```
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 select the associated data from the database, 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 with renamed column headings.

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

SQL*Plus Command-line Architecture

SQL*Plus uses a two-tier model comprising:

- Client Tier (Command-line user interface).
- Database Tier (Oracle9*i*).

The two tiers may or may not be on the same machine.

Command-line User Interface

The command-line user interface is the character based terminal implementation.

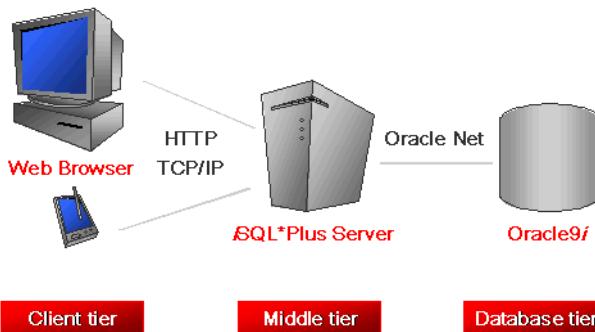
Oracle9*i*

Oracle Net components provide communication between the SQL*Plus Client and Oracle9*i*.

iSQL*Plus Architecture

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

- Client Tier (iSQL*Plus user interface, typically a web browser).
- Middle Tier (iSQL*Plus Server, Oracle Net, and Oracle HTTP Server).
- Database Tier (Oracle9*i*).



The iSQL*Plus Server must be on the same machine as the Oracle HTTP Server. The client tier 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 tier is Oracle9*i*, which is accessed via Oracle Net.

Web Browser

The *iSQL*Plus* user interface runs in a web browser connected to 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 Oracle HTTP Server to access Oracle9*i*.

*iSQL*Plus* Server

The *iSQL*Plus* Server is installed with the Oracle HTTP Server when Oracle9*i* is installed.

The middle tier contains the Oracle HTTP Server and the *iSQL*Plus* Server. The *iSQL*Plus* Server enables communication and authentication between the *iSQL*Plus* user interface and Oracle9*i*. Each *iSQL*Plus* session is uniquely identified, so you can have multiple concurrent sessions open to Oracle9*i*.

Oracle9*i*

Oracle Net components provide communication between the *iSQL*Plus* Server and Oracle9*i* in the same way as for a client server installation of Oracle9*i*.

SQL*Plus Installation

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

A few aspects of Oracle and SQL*Plus differ from one host computer and operating system to another. These topics are discussed in the Oracle installation and user's guide, published in a separate version for each operating system that SQL*Plus supports.

Keep a copy of your Oracle installation and user's guide available for reference.

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 Oracle.

The design of the SQL*Plus command language makes it easy to use. For example, to give a column labelled LAST_NAME in the database the clearer heading "Family Name", you might enter the following command:

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

Similarly, to list the column definitions for a table called EMPLOYEES, you might enter this command:

```
DESCRIBE EMPLOYEES
```

How Can I Learn SQL*Plus

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

- Online Help for SQL*Plus
 - Command-line and iSQL*Plus online help
- Using SQL*Plus Section of this Guide
 - Part II of this Guide, Chapters 5 through 12.
- SQLA Course for SQL*Plus
 - A course run by Oracle with the course code of SSQLA. A three day hands on course.

How to Use the SQL*Plus Guide

This guide gives you information about SQL*Plus that applies to all operating systems. Some aspects of SQL*Plus, however, differ on each operating system. Such operating system specific details are covered in the Oracle installation and user's 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 "[Oracle9i Sample Tables and SQL*Plus](#)" on page 1-6.

You will find the "[Conventions in Code Examples](#)" on page -xxiv particularly useful when referring to commands in this guide.

Oracle9i Sample Tables and SQL*Plus

Included with Oracle9*i*, are a number of sample schemas. The tutorial and examples in this guide use the EMP_DETAILS_VIEW view of the Human Resources (HR) sample schema. In using the HR sample schema you will come to understand the concepts and operations of this guide. This schema contains personnel records for a

fictitious company. As you complete the exercises in this guide, imagine that you are the personnel director for this company.

Dates in the sample tables use four digit years. As the default date format in SQL*Plus is DD-MM-YY, dates displayed show only a two digit year. Use the SQL TO_CHAR function in your SELECT statements to control the way dates are displayed.

For further information about the sample schemas included with Oracle9*i*, see the *Oracle9i Sample Schemas* guide. [Figure 1–1](#) shows a description of the view, EMP_DETAILS_VIEW.

Figure 1–1 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)

Unlocking the Sample Tables

The Human Resources (HR) Sample Schema is installed as part of the default Oracle9*i* installation. The HR user is locked by default.

You need to unlock the HR tables and user before you can use the HR sample schema. To unlock the HR tables and user, log in as the SYSTEM user and enter the following command:



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

For further information about unlocking the HR tables and login, see the *Oracle9i 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 *Oracle9i Sample Schemas* guide, or you can create the HR tables with the script HR_MAIN.SQL which is located in the following subdirectory on UNIX:

```
$ORACLE_HOME/DEMO/SCHEMA/HUMAN_RESOURCES/HR_MAIN.SQL
```

And on the following subdirectory 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 Oracle9i 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.

For more information about the sample schemas, see the *Oracle9i Sample Schemas* guide.

2

SQL*Plus User Interface

This chapter describes the SQL*Plus command-line and iSQL*Plus user interfaces, and the iSQL*Plus Extension for Windows. This chapter contains the following topics:

- [SQL*Plus Command-line User Interface](#)
- [iSQL*Plus User Interface](#)
- [iSQL*Plus Extension for Windows](#)

SQL*Plus Command-line User Interface

You can use the command-line interface to SQL*Plus to write SQL*Plus, SQL and PL/SQL commands to:

- Enter, edit, run store, retrieve, and save SQL commands and PL/SQL blocks.
- Format, Calculate, store, and print query results.
- List column definitions for any table.
- Send messages to and accept responses from an end user.
- Perform database administration.

The Command-line Screen

The SQL*Plus command-line interface is standard on all operating systems. The following shows SQL*Plus running in an X terminal.



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 command-line SQL*Plus is:

SQL>

iSQL*Plus User Interface

iSQL*Plus is a browser-based interface to Oracle9*i*. It is a component of the SQL*Plus product.

iSQL*Plus enables you to use a web browser to connect to Oracle9*i* and perform the same tasks as you would through the command-line version of SQL*Plus.

Different web browsers, and the size of the web browser window, may affect the appearance and layout of iSQL*Plus screens.

iSQL*Plus Navigation

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

- Using the global navigation icons
- Using the breadcrumb links

Icons

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

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

The following icons are displayed in iSQL*Plus screens (including online help):

 **Logout** Logs you out of the iSQL*Plus session and returns you to the Login screen.

 **New Session** Starts a new iSQL*Plus session in a separate web browser window. You can log in to the new session as the same user or as any other valid user.

 **History** Opens the iSQL*Plus History screen. You can select one or more previously executed scripts to reload into the Input area or to delete from the History list.

 **Preferences** Opens the iSQL*Plus Preferences screen where you can set interface options, system variables or change your password.

 **Help** Opens the iSQL*Plus Help in a separate web browser window.

- ▶ **Next** Takes you to the next page in iSQL*Plus Help.
- ◀ **Previous** Takes you to the previous page in iSQL*Plus Help.
- ☰ **Contents** Takes you to the contents in iSQL*Plus Help.
- ☷ **Index** Takes you to the index in iSQL*Plus Help.

Breadcrumbs

Breadcrumbs are navigation links showing the navigation path you have taken. They appear as text links displayed under the iSQL*Plus logo. Click on a breadcrumb link to return to any of the screens listed. For example, navigating to the Preferences screen using the Preferences icon displays a Work screen breadcrumb.

[Work Screen](#) > Preferences

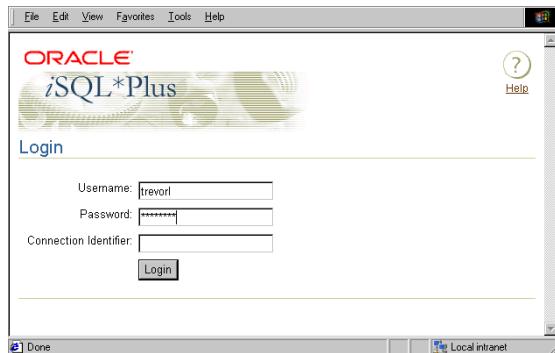
Click the Work Screen link to return to the Work screen.

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:



Username: Enter a valid username to connect to Oracle9i.

Password: Enter a valid password for the username.

Connection Identifier: Leave this field blank to use the default Oracle database if one exists, otherwise enter an Oracle Net alias to specify a remote database you want to connect to. If you use an Oracle Net alias, it must be defined on the machine running the iSQL*Plus Server, which may not be the same machine from which you run your web browser.

You can also use the full connection identifier, for example:

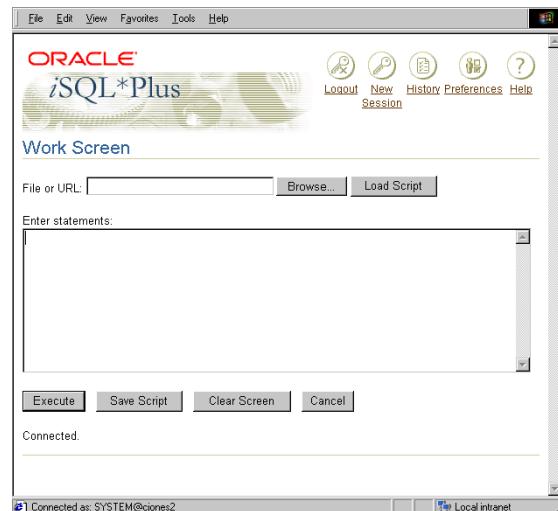
```
(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=www.oracle.com)
(PORT=1521)))(CONNECT_DATA=((SERVICE_NAME=orashop.us.acme.com)))
```

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 allows greater security for iSQL*Plus Servers in hosted environments.

Login Click the Login button to log in to iSQL*Plus with the supplied username, password and connection identifier.

iSQL*Plus Work Screen

After successfully logging in, the Work screen is displayed.



File or URL: Enter the path and filename or the URL of a file you want to load into the Input area for editing or execution.

Browse... Click the Browse... button to search for a script file that you want to load for editing or execution. When you select the file, its path and name are entered in the File or URL: field.

Load Script Click the Load Script button to load the script specified in the File or URL: field into the iSQL*Plus Input area for editing or execution.

Enter statements: Enter SQL statements, PL/SQL blocks, or iSQL*Plus commands. This area is also referred to as the Input area. You can resize the Input area in the Interface Options screen which you access from the Preferences screen.

Execute Click the Execute button to execute the contents of the Input area. Depending on your preference settings, the results are displayed in the Work screen, in a new web browser window, or saved to a file.

Save Script Click the Save Script button to save the contents of the Input area to a file. You are prompted to enter the name of the file. The file extension you choose is for your convenience. It may be useful to identify scripts with an extension of .SQL.

Clear Screen Click the Clear Screen button to clear all statements in the Input area, and all displayed output.

Cancel Click the Cancel button to interrupt the script that is currently running.

iSQL*Plus History Screen

Click the History icon to display the History screen. The History screen allows 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 Work screen if it is not the same as the most recently executed script. The History screen shows the leading 80 characters of the script.

Once you load a script from History, it is moved to the top of the History list, and when the History limit is reached, the earliest scripts are removed. When you exit a session the History is lost, 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.



Script Shows the current list of scripts in History. They are in most recently executed order, with the most recent at the top. You click the script text to load it 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 Work screen.

Delete Deletes the selected scripts from History.

Cancel Cancels the History screen without making further changes or loading a script from History.

iSQL*Plus Preferences Screen

The Preferences screen allows you to set interface options and system variables, and to change your password.



Set interface options Click Set interface options or the adjacent Go button to access the Interface Options screen. You use the Interface Options screen to set:

- Input area size
- Whether output is directed to the Work screen, to file, or to another web browser window
- History size

See "["iSQL*Plus User Interface Options"](#)".

Set system variables Click Set system variables or the adjacent Go button to access the System Variables screen. You use the System Variables screen to set iSQL*Plus system variables. See "["Saving Changes to the Database Automatically"](#)".

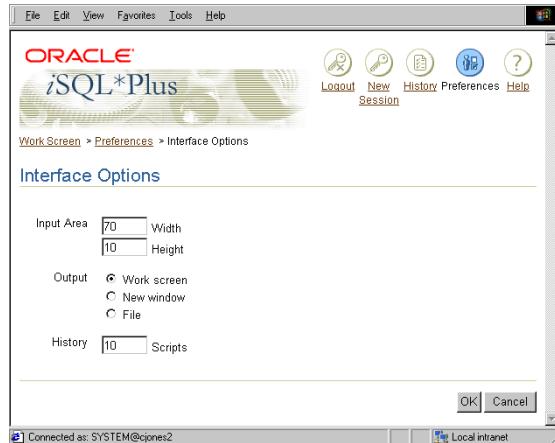
Change your password Click Change your password or the adjacent Go button to access the Change Password screen. See "["Changing Your Password in iSQL*Plus"](#)" on page 4-19.

Go You can click the link or the Go button to navigate to the associated screen.

OK/Cancel Click either the OK or the Cancel button to return to the iSQL*Plus Work screen.

iSQL*Plus User Interface Options

In the Interface Options screen, you can set the Input area size, where to output script results and the number of scripts to retain in the History. You access the Interface Options screen from the Preferences screen.



Input Area Enter the width in characters, and the height in lines that you want for the Input area. The default width is 70 characters, and the default height is 10 lines.

Output Select one of the three options to set the output destination for script results generated from your session:

- **Work screen**—when the contents of the Input area are executed, the resulting output is displayed on screen under the Input area. This is the default.
- **New window**—when the contents of the Input area are executed, the resulting output is displayed in a new web browser window.
- **File**—when the contents of the Input area are executed, the resulting output is saved to a file. You are prompted to enter the name of the file. As the output is in HTML format, it is useful to give the saved output file a .HTM or .HTML extension.

The Output setting returns to the default of Work screen every time a new session is started.

History Enter the number of scripts to be stored in History. The minimum value allowed is zero, the maximum 100, and the default is 10. If you set an invalid value, the previous valid value is used.

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 Oracle HTTP Server, and have Oracle SYSDBA or SYSOPER privileges from the Oracle instance.

To connect with either SYSDBA or SYSOPER privileges, your username and password must be added to the Oracle HTTP Server authentication file. See "[Enabling DBA Access](#)" on page 10-9.

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/isqlplusdba`

The following dialog box is displayed prompting you to enter your Oracle HTTP Server authentication username and password.



User Name Enter a valid Oracle HTTP Server authentication username. This may not be the same as your Oracle9*i* username.

Password Enter a valid Oracle HTTP Server authentication password for the username. This may not be the same as your Oracle9*i* password.

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



Username: Enter a valid username to connect to Oracle9*i*.

Password: Enter a valid password for the username. Your password is not displayed, asterisks are displayed for each character entered in the password field.

Connection Identifier: Leave this field blank to use the default Oracle database if one exists, otherwise enter an Oracle Net connection identifier to specify a remote database you want to connect to. You can use the full connection identifier, for example:

```
(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=www.oracle.com)
(PORT=1521)))(CONNECT_DATA=((SERVICE_NAME=orashop.us.acme.com)))
```

You can optionally use (INSTANCE_NAME=*instance*) phrase in place of the (SERVICE_NAME=*name*) phrase. When connecting to an Oracle8 or earlier database, you use the (SID=*name*) phrase. 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 allows greater security for iSQL*Plus Servers in hosted environments.

Privilege: The Privilege dropdown list has two options:

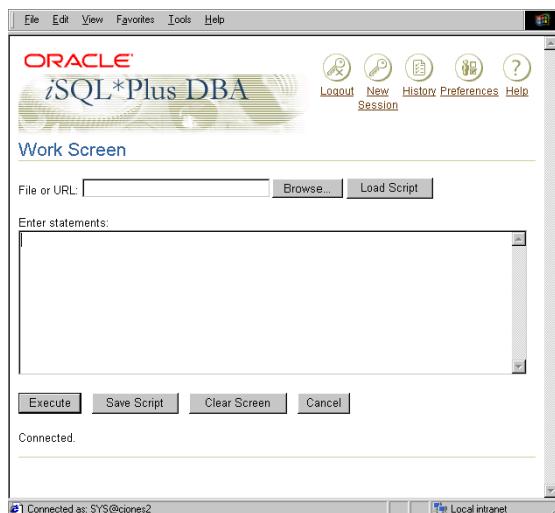
- **AS SYSDBA**—connects to the specified database with SYSDBA privileges.
- **AS SYSOPER**—connects to the specified database with SYSOPER privileges.

Login Click the Login button to log in to iSQL*Plus with the supplied username, password, connection identifier and DBA privilege.

iSQL*Plus DBA Work Screen

If you log in with SYSDBA or SYSOPER privileges, the iSQL*Plus DBA Work screen is displayed to remind you of the privileged connection.

Fill out the fields on the DBA Work screen as you would for the Work screen.



iSQL*Plus Server Statistics

iSQL*Plus Server statistics provide static environment information as well as dynamic information about iSQL*Plus sessions. The dynamic information may provide useful feedback that can be used for getting the best from the iSQL*Plus Server. For information about Tuning the iSQL*Plus Server, see "[Interpreting Active Statistics](#)" on page 9-13. You can request a report containing iSQL*Plus Server statistics with:

```
http://machine_name.domain:port/isqlplusdba?statistics={active|full}  
[&refresh=number]
```

where *machine_name.domain* is the URL of the Oracle HTTP Server for which you want to generate iSQL*Plus Server statistics.

where *port* is the port number used by the iSQL*Plus Server.

where `?statistics={active|full}` specifies the level of detail to report.

where

`full` gives all possible statistics and is the default.

`active` gives dynamically changing session statistics for the iSQL*Plus Server. These statistics are also included at the end of the full report.

where `[&refresh=number]` optionally specifies the time in seconds before the statistics report is automatically refreshed. The minimum value is 10 seconds.

You must have Oracle HTTP Server authentication to access the iSQL*Plus DBA URL, but as there is no connection to a database, no Oracle9*i* login is required.

The iSQL*Plus Server statistics report has the following sections.

Server Details

This section displays the following information about the iSQL*Plus Server:

- Host name
- Host address
- Oracle HTTP Server port
- Host system
- iSQL*Plus Server start time
- iSQL*Plus version
- iSQL*Plus logfile

Server Environment

This section shows settings for iSQL*Plus Server environment variables:

- ORACLE_HOME
- ORACLE_SID
- TNS_ADMIN
- NLS_LANG
- NLS_NCHAR

Configuration Parameters

This section shows settings for iSQL*Plus Server parameters:

- iSQLPlusNumberOfThreads
- iSQLPlusTimeOutInterval (minutes)
- iSQLPlusLogLevel
- iSQLPlusConnectIdList
- iSQLPlusHashTableSize

Client Details

This section shows the type of web browser used by the iSQL*Plus Client (HTTP client).

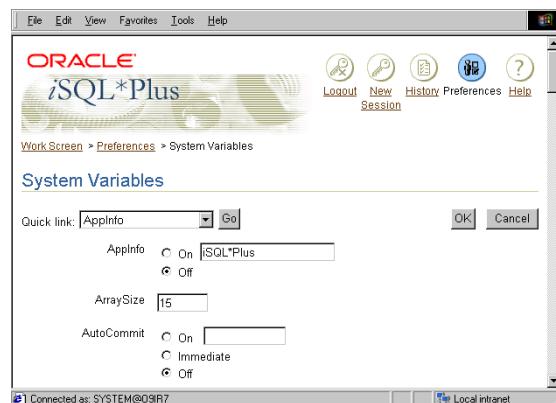
Active Statistics

For information about active statistics, see "[iSQL*Plus Server Statistics](#)" on page 9-12.

Setting System Variables in iSQL*Plus

You can set system variables for your iSQL*Plus session in the System Variables screen. You access the System Variables screen from the Preferences screen.

System variable settings return to their default values every time a new session is started.



Quick link: Use the dropdown list to select the system variable you want to set.

Go Click the Go button to navigate to the Quick link choice.

System variables and options There are checkboxes, radio buttons and text entry fields as required for each system variable. System variables are listed in alphabetical order.

The current state of system variables is displayed with the exception of the three system variables: CONSTRAINT, ROLE and TRANSACTION. While you can enter and set values for CONSTRAINT, ROLE and TRANSACTION through the associated text fields, the current state is never displayed.

OK Click the OK button to set all system variables that you have changed.

Cancel Click the Cancel button to return to the Preferences screen without making any changes.

Using SET and COLUMN Commands in iSQL*Plus

iSQL*Plus remembers the state of your current SET command variables from one execution to the next. If you use the Back button on your web browser and then re-execute scripts, or if you re-execute scripts from the History screen, iSQL*Plus may display the results differently, according to any commands executed since the original script was executed. For example, a new SET PAGESIZE command may set column headings to appear in different positions.

The COLUMN command, and the SET LINESIZE and SET WRAP commands have an effect on the buffer sizes used by iSQL*Plus. If words in your script output include unexpected white spaces or are truncated, make sure the column size is large enough to accommodate the word, and that word wrapping is set to ON.

iSQL*Plus Extension for Windows

The iSQL*Plus Extension for Windows provides a context menu to load or execute local SQL scripts in iSQL*Plus. The iSQL*Plus Extension for Windows works with .SQL files and is activated by right clicking a .SQL file in Windows Explorer.

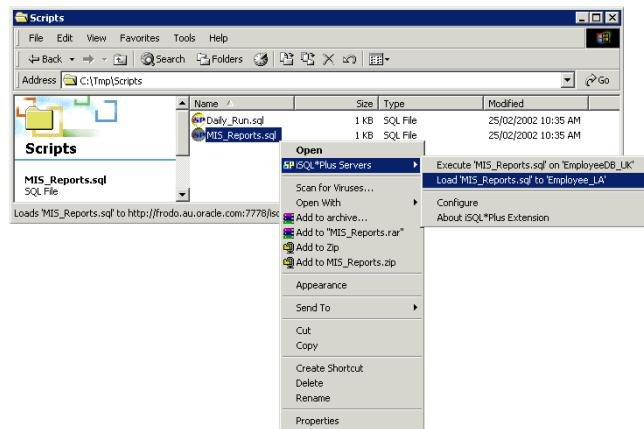
The utility is installed during Oracle9i Database and Oracle9i Client for Windows installations. After installation, you can configure access to one or more iSQL*Plus Servers.

Context Menu

After you have configured an iSQL*Plus Server, you can use the context menu to:

- Run or load local scripts accessible from your workstation
- Select the server to use from a list of configured iSQL*Plus Servers
- Choose the double click file association for .SQL files
- Choose the language to use from a list of configured languages

The following shows a typical view of the context menu with iSQL*Plus Servers configured.



The highlighted iSQL*Plus Server is configured to start iSQL*Plus in a browser and load *MIS_Reports.sql* into the Input area of the iSQL*Plus Server named Employee_LA.

For information about configuring iSQL*Plus Servers in the iSQL*Plus Extension, see "[iSQL*Plus Extension for Windows Configuration](#)" on page 3-15.

3

Configuring SQL*Plus

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

- [SQL*Plus Configuration](#)
- [iSQL*Plus Configuration](#)
- [iSQL*Plus Extension for Windows Configuration](#)

SQL*Plus Configuration

You may wish to set up your SQL*Plus environment in a particular way (such as showing the current time as part of the SQL*Plus command prompt) and then reuse those settings with each session. You can do this through two host operating system files, the Site Profile for site wide settings, and the User Profile for user specific settings. The exact names of these files is system dependent; see the Oracle installation and user's guide provided for your operating system for the precise name.

Site Profile

SQL*Plus supports a global Site Profile, a SQL*Plus script created by the database administrator. This file is generally named *glogin.sql*. SQL*Plus executes this script whenever any user starts SQL*Plus and SQL*Plus establishes the Oracle connection. The global Site Profile allows the DBA to set up SQL*Plus environment defaults for all users at a particular site; users cannot directly access the Site Profile.

The site profile file is \$ORACLE_HOME/sqlplus/admin/glogin.sql. 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 file is deleted.

User Profile

SQL*Plus also supports a User Profile, executed after the Site Profile. This file 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 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 ineffective in the iSQL*Plus user interface context, and cannot be used to control the initial settings or behavior of an individual iSQL*Plus session.

Modifying Your LOGIN File

You can modify your LOGIN file just as you would any other script. You may wish to add some of the following commands to the LOGIN file:

SET LINESIZE	Followed by a number, sets the number of characters as page width of the query results.
SET NUMFORMAT	Followed by a number format (such as \$99,999), sets the default format for displaying numbers in query results.
SET PAGESIZE	Followed by a number, sets the number of lines per page.
SET PAUSE	Followed by ON, causes SQL*Plus to pause at the beginning of each page of output (SQL*Plus continues scrolling after you enter Return). Followed by text, sets the text to be displayed each time SQL*Plus pauses (you must also set PAUSE to ON).
SET SQLPROMPT	Followed by the connect information variable in the form: SET SQLPROMPT '&_CONNECT_IDENTIFIER >' changes the SQL*Plus command-line prompt to display the SID of the database you are connected to.
SET TIME	Followed by ON, displays the current time before each command prompt.

See the [SET](#) command on page 13-95 for more information on these and other SET command variables you may wish to set in your SQL*Plus LOGIN file.

Storing and Restoring SQL*Plus System Variables

You can store the current SQL*Plus system (“SET”) variables in a host operating system file (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.

To store the current setting of all system variables, enter

```
STORE SET file_name
```

By default, SQL*Plus adds the extension “SQL” to the file name. If you want to use a different file extension, type a period at the end of the file name, followed by the extension. Alternatively, you can use the [SET SUFFIX](#) command 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 SUFFIX** 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 3–1 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
```

iSQL*Plus Configuration

Configuring iSQL*Plus is discussed in the following topics:

Configuring the Client Tier

This section discusses options for configuring your web browser to use iSQL*Plus.

Web Browser Setup

Your web browser needs to be configured to enable cookies. iSQL*Plus can be used without JavaScript, but you may find it better with JavaScript enabled.

Adding MIME Types

Some web browsers may require you to either remove a MIME type definition or application association for files with a .SQL extension, or to create a MIME type or application association for files with a .SQL extension in order to load scripts into iSQL*Plus.

Some browsers may require you to set up a MIME type to be able to save scripts to your local machine. If iSQL*Plus opens a new window when you click "Save Script" on the Work screen instead of prompting you to enter a filename to save the script, then set up a MIME type

```
application/vnd.oracle-isqlplus.script
```

and configure it to allow you to save to disk. Also add

```
application/vnd.oracle-isqlplus.output
```

to allow you to use the Save to file option accessed through the Interface Options screen of iSQL*Plus.

For example, to set up an application association for files with a SQL extension in Netscape Navigator 4.7 for Windows NT:

1. Select Preferences from the Edit menu.
2. Select Applications from the Navigator menu tree.
3. Click the New Type button. On the displayed form, enter

Description of type: SQL files

File extension: SQL

MIME type: text/plain

Application to use: notepad.exe

Uncheck the "use this MIME as the outgoing default for this extension"

If this is not set up in your web browser, you may get an error when you try to load scripts that iSQL*Plus cannot identify as text files.

Adding Proxy Server Exceptions

Some configurations of proxy servers may affect the ability of the iSQL*Plus user interface to connect with the iSQL*Plus Server. If you cannot connect with the iSQL*Plus Server, a browser alert "Document contains no data" or "Server Interrupt Error" is displayed when you try to load the iSQL*Plus Login screen. If the Oracle HTTP Server has been started and this situation occurs, you should reconfigure your proxy server or create a proxy exception in your browser for the Oracle HTTP Server running iSQL*Plus. There are two examples of setting proxy exceptions following:

To configure the proxy exceptions setting in Netscape Navigator 4.7 for Windows

1. Select Preferences from the Edit menu.
2. Select Proxies from the Advanced category.
3. Select the Manual proxy configuration radio button.
4. Click View. The Manual proxy configuration dialog is displayed.
5. Enter the Oracle HTTP Server domain for which you do not want to use a proxy in the Exceptions pane.

To configure the proxy exceptions setting in Microsoft Internet Explorer 5.0

1. Select Internet Options from the Tools menu.
2. Click Lan Settings in the Lan Settings pane on the Connections tab.
3. Click Advanced in the Proxy Server pane. This is only available if Use a proxy server is selected.
4. Enter "*" followed by the Oracle HTTP Server domain for which you do not want to use a proxy in the Exceptions pane. For example, to enter an exception for the Oracle HTTP Server domain, *machine_name.domain*, you must enter **.machine_name.domain*.

Retained Session Settings

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

- Input area size
- Number of History entries

Your username, password and Output preference are not saved by *iSQL*Plus*.

Configuring the Middle Tier: *iSQL*Plus* Server

The *iSQL*Plus* Server is installed during Oracle9*i* Database installation on the middle tier. You can configure several parameters and settings in the *iSQL*Plus* Server.

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 Oracle HTTP Server. You must ensure that your Oracle HTTP 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 Oracle HTTP Server to distribute user load across the multiple servers.

Editing the *iSQL*Plus* Configuration File

You can edit the *sqlplus.conf* configuration file directly to change settings for *iSQL*Plus* Server parameter settings such as:

- *iSQLPlusNumberOfThreads*
- *iSQLPlusLogLevel*
- *iSQLPlusTimeOutInterval*
- *iSQLPlusHashTableSize*
- *iSQLPlusConnectIdList*
- *-idle-timeout*

On Windows, the *isqlplus.conf* file is located in:

```
%ORACLE_HOME%\sqlplus\admin\isqlplus.conf
```

On UNIX, the *isqlplus.conf* file is located in:

```
$ORACLE_HOME/sqlplus/admin/isqlplus.conf
```

To change the value of an iSQL*Plus initialization parameter, edit the line associated with the parameter. The syntax of the line to be edited is shown in the following sections.

Setting the iSQL*Plus Threads Parameter

The *iSQLPlusNumberOfThreads* parameter sets the number of threads enabled in the iSQL*Plus Server. Because each thread enables an HTTP request to be handled, this value sets the maximum number of simultaneous HTTP requests that can be handled by the iSQL*Plus Server.

When many users are executing long running queries, increasing the *iSQLPlusNumberOfThreads* value may help performance. You can edit the iSQL*Plus configuration file, *isqlplus.conf*, to change the number of threads. The syntax of the line to change in the configuration file is:

```
FastCgiServer ... -initial-env iSQLPlusNumberOfThreads=n
```

Where *n* can have a minimum value of 1, and a maximum determined by machine resources. When no value is set, *iSQLPlusNumberOfThreads* defaults to 20.

Setting the iSQL*Plus Log Level

There should be no need to set *iSQLPlusLogLevel* to warn or debug unless instructed to by Oracle Support.

The *iSQLPlusLogLevel* parameter determines whether logging is enabled to record iSQL*Plus Server messages, and the level of logging. Logging is useful to help resolve user problems. Logging can be turned off, set to warn level or set to debug level, which provides the richest information.

iSQLPlusLogLevel defaults to warn if it is set to an invalid value or if it is not set. If the log file cannot be opened or written, it is set to off. The default logfile location is *%ORACLE_HOME%\sqlplus\log\isqlplus\log.xml* in Windows, and *\$ORACLE_HOME/sqlplus/log/isqlplus/log.xml* in UNIX. A new log file is started when its size reaches 64 kilobytes. The old file is renamed with a unique name like *log1006130580.xml*. A maximum of 10 log files are kept, and older files are automatically deleted.

When logging is enabled, *iSQL*Plus* appends log data to an existing log file, or creates a new file if one does not exist. If there is any sort of write error that prevents writing to the logfile, *iSQL*Plus* starts, but does not create a log file or log any messages.

The log directory must be writable by *iSQL*Plus*. The log directory has owner write permissions. If *iSQL*Plus* is running as nobody and therefore cannot write to the log file, the *iSQL*Plus* administrator must manually give *iSQL*Plus* write permissions on the log file. It is not recommended to grant world write permission to the file except for temporary testing or tracing purposes.

Some abnormal errors may be written to the Oracle HTTP Server log file. These may include errors generated if the *iSQL*Plus* Server cannot be started. These errors are written even if *iSQLPlusLogLevel* is OFF.

When *iSQLPlusLogLevel* is set to debug, then process tracing information is logged.

You can edit the *iSQL*Plus* configuration file, *sqlplus.conf*, to change the log level. The syntax of the line to change in the configuration file is:

```
FastCgiServer ... -initial-env iSQLPlusLogLevel=[off|warn|debug]
```

Setting the *iSQL*Plus* Time Out Parameter

Timing out *iSQL*Plus* sessions helps to reduce machine load and to maximize resources. The time out interval is set by the *iSQLPlusTimeOutInterval* initialization parameter. It defines the time a session can be idle before it is expired. You can edit the *iSQL*Plus* configuration file, *sqlplus.conf*, to change the timeout interval. The syntax of the line to change in the configuration file is:

```
FastCgiServer ... -initial-env iSQLPlusTimeOutInterval=n
```

Where *n* is the number of whole minutes of idle time before the session times out. *iSQLPlusTimeOutInterval* has a default of 30 minutes. It can be set to any value from 1 to 1440 minutes. 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 and the following error is displayed:

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

Setting the iSQL*Plus Hash Table Size Parameter

The number of hash table entries is defined by the `iSQLPlusHashTableSize` initialization parameter. Each user session consumes one entry in the hash table even if it is idle. Its default value is derived from the value of the `iSQLPlusNumberOfThreads` parameter value. However, `iSQLPlusHashTableSize` can be set independently to tune the system.

You can edit the *iSQL*Plus* configuration file, `isqlplus.conf`, to change the hash table size. The syntax of the line to change in the configuration file is:

```
FastCgiServer ... -initial-env iSQLPlusHashTableSize=n
```

Where *n* is the number of entries in the hash table.

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 allows greater security for *iSQL*Plus* Servers in hosted environments. Connection identifiers are listed in the order defined in `iSQLPlusConnectIdList`.

You can edit the *iSQL*Plus* configuration file, `isqlplus.conf`, to restrict database access. The syntax of the line to change in the configuration file is:

```
FastCgiServer ... -initial-env "iSQLPlusConnectIdList=SID1, SID2,..."
```

where *SID1*, *SID2*, ... is a comma separated list of Oracle Net connection identifiers specifying permitted databases. For example:

```
FastCgiServer ... -initial-env "iSQLPlusConnectIdList=ABC1, PROD2, DEV3"
```

Note the use of quotes in the example. The opening quote must occur before the `iSQLPlusConnectIdList` parameter name, the closing quote at the end of the list of SIDs.

For more information about restricted database access, see "[Enabling or Disabling Restricted Database Access](#)" on page 10-10.

Setting the iSQL*Plus Idle Timeout

The FastCGI timeout parameter or idle timeout is the time the Oracle HTTP Server waits for results from *iSQL*Plus*. It is set to a value likely to prevent *iSQL*Plus* timing out before the web browser. It is sufficient for many long queries to return results before *iSQL*Plus* times out.

The idle timeout should not be confused with the `iSQLPlusTimeOutInterval` which manages the lifetime of a user's session.

You can edit the `iSQL*Plus` configuration file, `isqlplus.conf`, to change the idle timeout value. The syntax of the line to change in the configuration file is:

```
FastCgiServer ... -initial-env -idle-timeout=n
```

Where `n` is the number of seconds of the Oracle HTTP Server waits for results from `iSQL*Plus`. The default value is 3600 seconds.

Changing the Cascading Style Sheet

`iSQL*Plus` uses a cascading style sheet to control the format of the user interface. You can replace the default style sheet with your own style sheet. It is recommended that you do not delete the default style sheet, but rename it so that you can revert to it if necessary.

For example, to replace the cascading style sheet in Windows

1. Navigate to the `%ORACLE_HOME%\sqlplus\admin\iplus\` directory.
2. Rename the existing style sheet from `iplus.css` to another name.
3. Copy your new style sheet to the `%ORACLE_HOME%\sqlplus\admin\iplus\` directory.
4. Rename your new style sheet to `iplus.css`.
5. You may need to refresh your web browser display to see the effects of your new style sheet.

Enabling Server Authentication for Users

By default, Oracle HTTP Server authentication is required for SYSDBA and SYSOPER privileged users. You may also want to limit who can access `iSQL*Plus` by requiring Oracle HTTP Server authentication for normal user logins. See "[Enabling Server Authentication for Users](#)" on page 10-10 for more details.

Enabling DBA Access

To connect with SYSDBA or SYSOPER privileges, or to generate the `iSQL*Plus` Server Statistics report, your username and password must be added to the `iSQL*Plus` authentication file for the Oracle HTTP Server. See "[Enabling DBA Access](#)" on page 10-10 for more details.

Configuring the Middle Tier: Oracle HTTP Server

The Oracle HTTP Server is installed during Oracle9i Database installation on the middle tier. You can:

- [Test the Oracle HTTP Server Configuration File](#)
- [Start and Stop the Oracle HTTP Server](#)
- [Enable or Disable iSQL*Plus](#)

Additional iSQL*Plus configuration information must be included in the Oracle HTTP Server configuration file, *httpd.conf*, for the iSQL*Plus Server.

There are two layers of nested configuration files:

- *httpd.conf* includes the Oracle9i configuration file, *oracle_apache.conf*
- *oracle_apache.conf* includes the iSQL*Plus configuration file, *isqlplus.conf*.

Changes are usually only made to:

- *isqlplus.conf* to configure the iSQL*Plus Server.
- *oracle_apache.conf* to disable iSQL*Plus

After making changes to .conf files, check them to make sure there are no errors, and then stop and start the Oracle HTTP Server to implement the changes.

Testing the Oracle HTTP Server Configuration File

To check the Oracle HTTP Server configuration file, *httpd.conf*, and any included configuration files for errors. On Windows do the following steps:

1. Open a Windows Command Prompt.
2. Change directory to the Oracle HTTP Server home directory by entering:

```
cd %ORACLE_HOME%\Apache\Apache\conf
```
3. Parse the Oracle HTTP Server *httpd.conf* configuration file by entering:

```
apache -t
```

Any errors in the configuration file are displayed. If there are any errors, edit the included configuration files, *oracle_apache.conf* or *isqlplus.conf*, again to correct them and then test again. If there are no errors, the message "Syntax OK" is displayed.

On UNIX, do the following steps:

1. Open a terminal.
2. Change directory to the Oracle HTTP Server home bin directory by entering:
`cd $ORACLE_HOME/Apache/Apache/conf`
3. Parse the Oracle HTTP Server *httpd.conf* configuration file by entering:
`apachectl configtest`

Any errors in the configuration file are displayed. If there are any errors, edit the included configuration files, *oracle_apache.conf* or *isqlplus.conf*, again to correct them and then test again. If there are no errors, the message "Syntax OK" is displayed.

Starting and Stopping the Oracle HTTP Server

For changes to the Oracle HTTP Server configuration file, *httpd.conf*, and any included configuration files to take affect, you must stop and restart the Oracle HTTP Server if it is running. There is no convenient way to know how many users are currently accessing the server, so it is important to have the server down for the shortest time. When making changes to configuration files parse the *httpd.conf* configuration file and report any errors before starting and stopping the Oracle HTTP Server.

To stop and start the Oracle HTTP Server. On Windows do the following steps:

1. Open a Windows Command Prompt.
2. Change directory to the Oracle HTTP Server home directory by entering:
`cd %ORACLE_HOME%\Apache\Apache`
3. Stop the running Oracle HTTP Server by entering:
`apache -k shutdown`
4. Start the Oracle HTTP Server by entering
`apache -k start`

On UNIX, do the following steps:

1. Open a terminal.

2. Change directory to the Oracle HTTP Server home bin directory by entering:

```
cd $ORACLE_HOME/Apache/Apache/bin
```

3. Stop the running Oracle HTTP Server by entering:

```
apachectl stop
```

4. Start the Oracle HTTP Server by entering

```
apachectl start
```

Warning: If the Oracle HTTP Server is started by a user who is a member of the "dba" or "oper" groups on UNIX, or who is a member of the ORA_DBA, ORA_OPER, ORA_SID_DBA, or ORA_SID_OPER groups on Windows, the iSQL*Plus DBA URL is automatically authenticated for Oracle9i by the operating system. To avoid this, start the Oracle HTTP Server as a user who is not a member of these operating system groups.

Users of the iSQL*Plus DBA URL can authenticate for Oracle9i using '/ as sysdba' or '/ as sysoper'.

Enabling or Disabling iSQL*Plus

You can edit the Oracle HTTP Server configuration file to disable iSQL*Plus.

To disable iSQL*Plus

1. Stop the Oracle HTTP Server.
2. Change directory to the Oracle HTTP Server configuration directory by entering:

On Windows:

```
cd %ORACLE_HOME%\Apache\Apache\conf
```

On UNIX:

```
cd $ORACLE_HOME/Apache/Apache/conf
```

3. Open the *oracle_apache.conf* configuration file.
4. Comment out the *isqlplus.conf* include line by inserting a # at the beginning of the line as follows:

On Windows:

```
# include "ORACLE_HOME\sqlplus\admin\isqlplus.conf"
```

On UNIX:

```
# include "ORACLE_HOME/sqlplus/admin/isqlplus.conf"
```

Where ORACLE_HOME is the path of your Oracle home directory.

5. Save your *oracle_apache.conf* file.
6. Check your edits by parsing the edited configuration file. See "[Testing the Oracle HTTP Server Configuration File](#)"
7. When you next start the Oracle HTTP Server, iSQL*Plus is disabled.

To re-enable iSQL*Plus, reverse the edit to uncomment the include line in *oracle_apache.conf* and restart the Oracle HTTP Server.

Configuring the Middle Tier: Oracle Net

If you plan to connect to a remote database you need to ensure that you install and configure Oracle Net on the middle tier middle tier where the iSQL*Plus server is running. For further information about installing and configuring Oracle Net, see the Oracle9*i* documentation.

Configuring the Database Tier

Oracle9*i* is installed on the database tier. The database tier may be physically separate from the middle tier and accessed using Oracle Net, or it may be the same physical machine as used by the middle tier. If you are using Oracle Net to access the database, then make sure the database listener is configured and running. For further information about installing and configuring Oracle9*i*, see the Oracle9*i* documentation.

iSQL*Plus Extension for Windows Configuration

The iSQL*Plus Extension for Windows is accessed through extended menus in Windows platforms. The iSQL*Plus Extension for Windows extended menu is accessed by right clicking files with the .SQL file extension.

If you have installed the Oracle9*i* Server, iSQL*Plus Server entries for your Oracle HTTP Server are created by default. If you have installed the Oracle9*i* Client, no

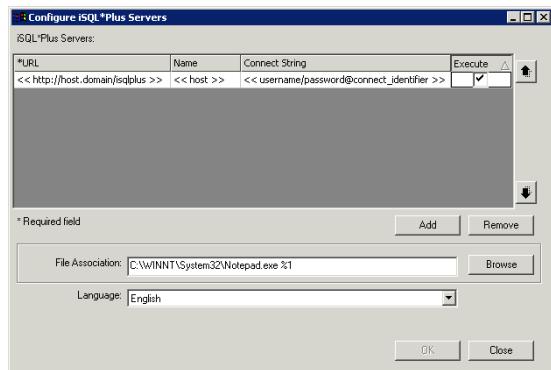
iSQL*Plus Server entries are created. You can use the Configuration dialog to configure the available iSQL*Plus Servers that you want.

Configuration Dialog

You can open the Configuration dialog by right clicking a .SQL file in Windows Explorer, then select iSQL*Plus Servers, and then Configure. The Configure iSQL*Plus Servers dialog is displayed.

When the column is narrower than the field it contains, tool tips show the full text in the field, but to edit or copy a field, make sure that the column width is wide enough to display the full field. You can widen the column by selecting and dragging the heading column separator.

You can sort the list of iSQL*Plus Servers in ascending or descending field name order by clicking the field name column heading. You can also manually sort the server definitions by using the up and down arrow buttons on the right side of the list of iSQL*Plus Servers.



URL Enter a valid iSQL*Plus Server URL in the form:

`http://host.domain/sqlplus`

This field is mandatory.

Name Enter a name for this iSQL*Plus Server. The name, if entered, is used in the context menu, otherwise the full iSQL*Plus Server URL is used.

Connect String Enter a connect string to specify your username and password and the database you want to connect to. If you omit a username and password you are

prompted for them when *iSQL*Plus* starts. If you omit a database connection identifier or Oracle Net alias, you are connected to the default database.

Execute Clear the Execute checkbox to change the action performed on the selected file. The default action is Execute, the alternative is Load. Execute runs the selected file in the *iSQL*Plus* Server and displays the results in your browser. Load opens the *iSQL*Plus* Server and loads the selected file into the Input area.

Add Click Add to add a new *iSQL*Plus* Server.

Remove Click Remove to delete a selected *iSQL*Plus* Server definition.

File Association: Enter a path and arguments for the application you want to associate with the .SQL file extension when you double click. The default application is Windows Notepad. This definition does not affect the *iSQL*Plus* Server definitions.

Browse Click Browse to find an application you want to associate with the .SQL file extension when you double click.

Language: Select a language you want to use in the *iSQL*Plus* Extension from the dropdown list of available languages:

- Brazilian Portuguese
- English
- French/Canadian French
- German
- Italian
- Japanese
- Korean
- Simplified Chinese
- Spanish/LA Spanish
- Traditional Chinese

This language setting only affects the *iSQL*Plus* Extension, not *iSQL*Plus*.

OK Click OK to save your changes and close the Configure *iSQL*Plus* Servers dialog.

Cancel Click Cancel to quit your changes and close *iSQL*Plus* Extension. You are prompted once more before your changes are lost.

When you first open the Configure iSQL*Plus Servers dialog, the OK button is unavailable and the Cancel button is labelled Close. Once you make changes, OK is enabled and Close is renamed Cancel.

Adding a Server

You must configure at least one iSQL*Plus Server before you can use the iSQL*Plus Server Extension. To add an iSQL*Plus Server, perform the following steps:

1. Right click on a .SQL file in Windows Explorer.
2. Select iSQL*Plus Servers to display the context menu options. Initially, there are the following options:
 - No iSQL*Plus Servers configured
If you have installed Oracle9i Server, there are two iSQL*Plus Servers configured, one for the standard URL and one for the DBA URL.
 - Configure.
 - About iSQL*Plus Extension.
3. Click Configure. The Configure iSQL*Plus Servers dialog is displayed.
4. Enter an iSQL*Plus Server definition in the iSQL*Plus Servers: area. When you first open the dialog, the following syntax model is displayed to show you the expected field contents:

```
URL: << http://host.domain/sqlplus >>
Name: << host >>
Connect String: << username/password@connect_identifier >>
```

You must enter a URL for your iSQL*Plus Server, the other fields are optional. This may be different if iSQL*Plus Servers have been configured during an Oracle9i Server installation.

5. Click OK to save your new server definition.

The new iSQL*Plus Server Name appears in the context menu. When you select a server from the context menu, the full iSQL*Plus Server URL is shown in the status bar.

Modifying a Server

To modify an *iSQL*Plus* Server, perform the following steps:

1. Right click on a .SQL file in Windows Explorer.
2. Select *iSQL*Plus* Servers to display the context menu options.
3. Click Configure. The Configure *iSQL*Plus* Servers dialog is displayed.
4. Select the server you wish to modify from the list of available servers.
5. Edit the server definition directly in the text fields and press Enter when you have finished editing each field. To edit or copy a field when the column is narrower than the field it contains, you need to widen the column by selecting and dragging the heading column separator.
6. Click OK to save your changes.

The modified *iSQL*Plus* Server name appears in the context menu.

Removing a Server

Select the server you wish to remove from the list of available servers. The server's details will appear in the following text boxes. Click the Remove button to remove it from the list of available servers.

To remove an *iSQL*Plus* Server, perform the following steps:

1. Right click a .SQL file in Windows Explorer.
2. Select *iSQL*Plus* Servers to display the context menu options.
3. Click Configure. The Configure *iSQL*Plus* Servers dialog is displayed.
4. Select the server you wish to remove from the list of available servers.
5. Click Remove.
6. Click OK to save your changes.

The *iSQL*Plus* Server is removed from the context menu.

4

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:

- [Starting Command-line SQL*Plus](#)
- [The SQLPLUS Command](#)
- [Getting Command-line Help](#)
- [Exiting Command-line SQL*Plus](#)
- [Starting iSQL*Plus](#)
- [Getting Help in iSQL*Plus](#)
- [Exiting iSQL*Plus](#)
- [Starting iSQL*Plus](#)
- [Login Username and Password](#)
- [Database Connection Identifier](#)

Starting Command-line SQL*Plus

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

Example 4–1 Starting SQL*Plus

This example shows you how to start SQL*Plus. Follow the steps shown.

1. Make sure that SQL*Plus has been installed on your computer.
2. Log on to the host 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 9.2.0.1.0 - Production on Thu Aug 1 16:29:01 2002  
(c) Copyright 1986, 2002 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 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 command prompt indicates that SQL*Plus is ready to accept your commands. Throughout this guide, where you see the following keyboard icon

 in the margin, it is prompting you to enter information at the command prompt line. Where you see the computer screen icon  in the margin, it is showing you what you should expect to see displayed on your screen.

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

Shortcuts to Starting Command-line SQL*Plus

When you start SQL*Plus, you can enter your username and password, separated by a slash (/), following the command SQLPLUS. For example, you can enter



SQLPLUS HR/your_password

and press Return. You can also arrange to log in to SQL*Plus automatically when you log on to your host operating system. See the Oracle installation and user's guide provided for your operating system for details.

The SQLPLUS Command

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

SQLPLUS [[*Options*] [*Logon*] [*Start*]]

where:

Options on page 4-4 has the following syntax:

```
-H[ELP] | -V[ERSION]
| [ [-L[OGON]] [ -M[ARKUP] markup_option] [-R[ESTRICT] {1|2|3}]
[-SILENT]] ]
```

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}]
```

Logon on page 4-10 has the following syntax:

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

Start on page 4-12 has the following syntax:

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

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.

The following sections contain descriptions of SQLPLUS command terms:

Options

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. This option is not available with the Windows graphical user interface SQL*Plus executable.

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.

Use SQLPLUS -MARKUP HTML ON or SET 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 SET MARKUP HTML ON SPOOL OFF to generate HTML output suitable for embedding in an existing web page. Output generated this way has no <HTML> or <BODY> tags.

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 now the default behavior when the HTML option is set ON. You can generate output using HTML <PRE> tags by setting PREFORMAT ON.

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](#) in Chapter 13, "SQL*Plus Command Reference".

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

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, or in the case of SET MARKUP, options set by previous SET MARKUP HTML commands in the current session.

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

You enable the writing of HTML output with the MARKUP option, SPOOL ON, and you subsequently initiate writing output to a spool file with the SQL*Plus command, SPOOL *filename*. See [SPOOL {ON | OFF}](#) below, and the [SPOOL](#) command in [Chapter 13, "SQL*Plus Command Reference"](#) for more information.

HEAD *text*

The HEAD *text* option allows you to specify content for the <HEAD> tag. By default, *text* is:

```
<TITLE>SQL*Plus Report</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 allows 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 allows 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>SELECT DEPARTMENT_ID, CITY  
1   FROM EMP_DETAILS_VIEW  
2  WHERE SALARY = 12000;
```

With ENTMAP ON, SQL*Plus screen output is:

```
SQL&gt; SELECT DEPARTMENT_ID, CITY  
2   FROM EMP_DETAILS_VIEW  
3  WHERE SALARY = 12000;
```

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

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.

Note: ENTMAP only has affect when either the HTML option is set ON, or the SPOOL option is set ON. For more information about using entities in your output, see the [COLUMN](#) command on page 13-29.

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.

SQL*Plus writes several HTML tags to the spool file when you issue the SPOOL *filename* command. The tags written and their default content are:

```
<HTML>
<HEAD>
<TITLE>SQL*Plus Report</TITLE>
<META name="generator" content="SQL*Plus 9.0.1">
</HEAD>
<BODY>
```

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.

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

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

MARKUP Usage Notes

Existing scripts that do not explicitly set PREFORMAT ON will generate output in HTML tables. If you want output in HTML <PRE> tags, you must set PREFORMAT ON.

Some SQL*Plus commands have different behavior when output is directed to an HTML table. Commands originally intended to format paper reports may 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, they 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 and RECSEP only produce output in HTML reports when PREFORMAT is ON.

RESTRICT Option

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

Allows 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 7-1 shows the commands disabled in each restriction level.

Table 4-1 Commands Disabled by 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

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. If you enter your password on the command-line as part of the SQLPLUS command in the form,

`sqlplus username[/password]`

it could be viewable by anyone on your system. Some operating systems have monitoring tools that list all executing commands and their arguments.

If you omit *username* and *password*, SQL*Plus prompts you for them. If you omit only *password*, SQL*Plus prompts you for *password*. When prompting, SQL*Plus does not display *password* on your terminal screen. In silent mode, *username* and *password* prompts are not visible – your *username* will appear as you type it, but not your *password*.

@connect_identifier

Consists of an Oracle Net connect identifier. The exact syntax depends upon the Oracle Net communications protocol your Oracle installation uses. For more information, refer to the Oracle Net manual appropriate for your protocol 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 LOGON*name* or USERID*name*. See the *Oracle9i Database Administrator’s Guide* for information about operating system authentication.

AS {SYSOPER|SYSDBA}

The AS clause allows privileged connections by users who have been granted SYSOPER or SYSDBA system privileges. You can also use either of these privileged connections with / and /NOLOG.

If you use this option, you need to quote the command arguments on many operating systems, for example:

```
SQLPLUS "/ AS SYSDBA"  
SQLPLUS "SYSTEM/your_password AS SYSOPER"
```

/NOLOG

Establishes no initial connection to Oracle. 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 13-132 for more information.

Getting Command-line Help

To access online help for SQL*Plus commands, you can type HELP followed by the command name at the SQL command prompt. 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 usually fits in a single screen. For example:



`HELP INDEX`

If you get a response that help is unavailable, consult your database administrator. See the [HELP](#) command on page 13-68 for more information.

Installing Command-line Help

The database administrator creates the SQL*Plus help tables and populates them with SQL*Plus help data. Before you can install SQL*Plus help, ensure that:

- SQL*Plus is installed, otherwise, you cannot create and load the help tables.
- The default tablespace for the SYSTEM user is large enough to accommodate the help system. You must have at least 128K of free space.

- The SQL*Plus help script files are available in

```
$ORACLE_HOME/SQLPLUS/ADMIN/HELP/
```

The help script files are:

- HLPBLD.SQL - to drop and create new help tables.
- HELPUS.SQL - to populate the help tables with the help data.
- HELPDROP.SQL - to drop existing SQL*Plus help tables.

To install SQL*Plus help:

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

```
SQLPLUS SYSTEM/your_password
```

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

2. Run the SQL script, HLPBLD.SQL, from SQL*Plus with:

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

Exiting Command-line SQL*Plus

When you are done working with SQL*Plus and wish to return to the operating system, enter the EXIT command at the SQL*Plus command prompt.

Example 4-2 Exiting SQL*Plus

To leave SQL*Plus, enter the EXIT command at the SQL*Plus command prompt:

```
EXIT
```

SQL*Plus displays the version of Oracle from which you disconnected and the versions of tools available through SQL*Plus. After a moment you will see the operating system prompt.

Before continuing with this chapter, follow steps 3, 4, and 5 of [Example 4-1](#) to start SQL*Plus again. Alternatively, log in using the shortcut shown under "[Shortcuts to Starting Command-line SQL*Plus](#)".

Starting iSQL*Plus

The Oracle HTTP Server and the iSQL*Plus Server must be running on the middle tier before you can run iSQL*Plus. See "[Starting and Stopping the Oracle HTTP Server](#)" on page 3-13

To run iSQL*Plus

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 Oracle HTTP 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 "[Database Connection Identifier](#)" for more information.
3. Click the Login button. The iSQL*Plus Work screen is displayed.

To run iSQL*Plus with SYSDBA or SYSOPER privileges, use the iSQL*Plus DBA URL:

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

When you are connected through the iSQL*Plus DBA URL, the Oracle HTTP Server authentication permits AS SYSDBA or AS SYSOPER connections through the DBA Login screen, or through a CONNECT command, but the Oracle9*i* username and password authentication may still prevent access.

Getting Help in iSQL*Plus

The online iSQL*Plus Help provides help and syntax specific to iSQL*Plus. Click the Help icon to access the iSQL*Plus Help. It is displayed in a new browser window. iSQL*Plus Help is available in the following eight languages:

Brazilian Portuguese

French

German

Italian

Japanese
Korean
Simplified Chinese
Spanish

English is installed by default. For more information about language support in SQL*Plus, see [Chapter 12, "SQL*Plus Globalization Support"](#).

Exiting iSQL*Plus

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

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

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, HTTPS 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 Work screen.

You can invoke iSQL*Plus as a normal user, or with SYSDBA or SYSOPER privileges. You can also invoke iSQL*Plus to generate a report on iSQL*Plus Server settings and statistics.

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

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

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

```
http://machine_name.domain:port/isqlplusdba[?DBAOpts]
```

or to invoke iSQL*Plus to generate the iSQL*Plus Server statistics report, use:

```
http://machine_name.domain:port/isqlplusdba[?Statistics]
```

where

machine_name.domain is the URL of the Oracle HTTP Server

port is the number of the port used by the Oracle HTTP Server

UserOpts is UserLogin|Script|UserLogin&Script

DBAOpts is DBALogin|Script|DBALogin&Script

Statistics is statistics={active|full}[&refresh=*number*]

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 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 Input area of the Work screen, but it is not executed. A web browser may not be able to display large scripts in the Work screen, and as a result, scripts may be truncated.

See "[iSQL*Plus Server Statistics](#)" on page 2-12 for an explanation of the Statistics syntax and functionality.

Examples

To log into *iSQL*Plus* with the username *hr* and password *your_password*, enter

```
http://machine_name.domain/sqlplus?userid=hr/your_password
```

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

```
http://machine_name.domain:port/sqlplus?script=http://machine_name2.domain/myscript.sql
```

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

```
http://machine_name.domain:port/sqlplusdba?userid=hr/your_password@oracle9i%20as%20sysdba&script=ftp://machine_name2.domain/script.sql&name=*&salary=12000
```

As the *iSQL*Plus* DBA URL is used, Oracle HTTP 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:port/sqlplus?script="select * from employee_details_view;"&type=text&action=load
```

Login Username and Password

When you start SQL*Plus, you need a *username* that identifies you as an authorized Oracle user and a *password* that proves you are the legitimate owner of your username.

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

Default logins are created and displayed in messages during Oracle9*i* installation. The default login *username/password* combinations created are:

- SYS/CHANGE_ON_INSTALL
- SYSTEM/MANAGER

Default passwords and your database account password should be changed as soon as possible. See "[Changing your Password](#)" following. For further information about the default logins, see the *Oracle9i Database Administrator's Guide*.

Once you have logged in, you can connect under a different username with the SQL*Plus 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/FOX
```

In the command-line interface, if you omit the username and password, SQL*Plus prompts you for them. You also have the option of typing only the username following CONNECT and omitting the password (SQL*Plus then prompts for the password). 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, SQL*Plus prompts you 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 disconnect the username currently connected to Oracle without leaving SQL*Plus by entering the SQL*Plus command DISCONNECT.

Changing your Password

In the command-line interface, you can change your password with the PASSWORD command. See "["PASSWORD"](#)" on page 13-75.

Once you have logged in, you can connect under a different username with the CONNECT command. The username and password must be valid for the database.

For example, to connect the username HR to the default database using the password *your_password*, you could enter

```
CONNECT HR/your_password
```

You can disconnect the username currently connected to Oracle without leaving SQL*Plus or ending your iSQL*Plus session with the DISCONNECT command.

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.



Username: Enter your Oracle database account username.

Old password: Enter your current Oracle database account password.

New password: Enter your new password.

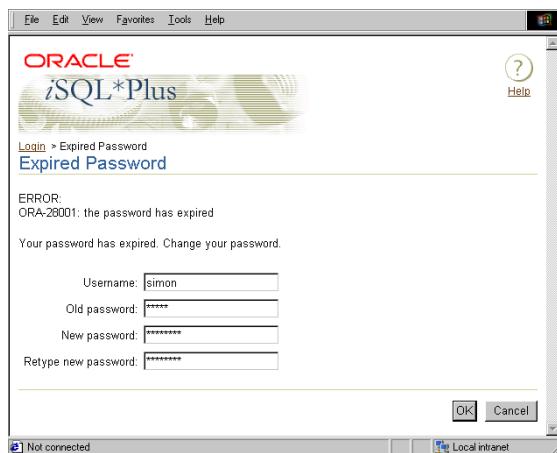
Retype new password: Enter your new password again to make sure you have entered it correctly.

OK Click the OK button to change the password for your Oracle database account.

Cancel Click the Cancel button to return to the Preferences screen without changing your password.

iSQL*Plus Expired Password Screen

The Expired Password screen is automatically displayed on attempting to log into iSQL*Plus if your password has expired. Fill out the fields on the Expired Password screen as you would for the [Change Password screen](#).



Multi-User Systems

Each user must have a username and password to access the operating system. These may or may not be the same ones you use with SQL*Plus.

Single-User Systems

If only one person at a time uses your computer, you may be expected to perform the functions of a DBA for yourself. If you want to define your own username and password, see the *Oracle9i SQL Reference*.

Database Connection Identifier

To use SQL*Plus to access data in an Oracle database, you must first connect to the database. When starting SQL*Plus, you use a *connection identifier* to specify the database you want to connect to. The *connection identifier* is an argument to the SQLPLUS command you use to start a command-line connection, or it is entered in the Connection Identifier field on the iSQL*Plus Login Screen.

If you omit the *connection identifier*, you are connected to the default database. You must use a *connection identifier* to specify any database other than the default database.

The DBA is responsible for creating the databases you use and giving you the *connection identifiers* that allow you to connect to those databases. In the iSQL*Plus user interface, the database administrator can provide a restricted list of connection

identifiers. These are accessed through a dropdown list which replaces the usual Connection Identifier field on the Login Screen.

The default database is configured at an operating system level by setting operating system environment variables, symbols or, possibly, by editing an Oracle specific configuration file. Refer to the Oracle documentation for your operating system for more information.

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

Databases on other computers, or databases on your host computer other than your default database are called *remote databases*. You can access a remote database if it has Oracle Net configured and both databases have compatible network drivers. You can connect to a remote database in two ways:

- As you start SQL*Plus
- Using the CONNECT command

Connecting to a Remote Database as You Start SQL*Plus

To connect to a remote database when you start iSQL*Plus, enter the Oracle Net service name in your Login screen Connection identifier field. Leave the field blank to use the default Oracle database if one exists, otherwise enter an Oracle Net alias to specify a remote database you want to connect to. If you use an Oracle Net alias, it must be defined on the machine running the iSQL*Plus Server, which may not be the same machine from which you run your web browser.

To connect to a remote database when you start command-line SQL*Plus, include the Oracle Net service name in your SQLPLUS command in the following form:

```
SQLPLUS HR/your_password@connect_identifier
```

You can also use the full connection identifier, for example:

```
(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=www.oracle.com)
(PORT=1521)))(CONNECT_DATA=((SERVICE_NAME=orashop.us.acme.com)))
```

You must use a username and password valid for the remote database and substitute the appropriate service name for the remote database. Command-line SQL*Plus prompts you for a username and password as needed. The database you connect to is used until you CONNECT to another database, DISCONNECT, or exit SQL*Plus.

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 as this user is not permitted until the account is unlocked by your DBA.

Connecting to a Remote Database Using the CONNECT Command

To connect to a remote database using the CONNECT command, include an Oracle Net connection identifier in the CONNECT command in the following form:

```
CONNECT HR/your_password@connect_identifier
```

For more information, see the Oracle Net guide appropriate for your protocol, or contact your DBA.

Command-line SQL*Plus prompts you for a password as needed, and connects you to the specified database. In iSQL*Plus, you are not prompted, but must supply the username and password with the CONNECT command.

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 as this user is not permitted until the account is unlocked by your DBA.

When you connect to a remote database in this manner, you can use the complete range of SQL and SQL*Plus commands and PL/SQL blocks on the database.

The exact string you enter for the service name depends upon the Oracle Net protocol your computer uses. For more information, see [CONNECT](#) on page 13-46 and the Oracle Net guide appropriate for your protocol, or contact your DBA.

Note: Do not confuse the @ symbol of the connect identifier with the @ command used to run a script.

Part II

Using SQL*Plus

This section 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.

The following chapters are covered in this section:

- [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](#)

5

SQL*Plus Basics

This chapter helps you learn the basics of using SQL*Plus, including the following topics:

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

Entering and Executing Commands

Unless stated otherwise, descriptions of command use are generally applicable to both command-line and iSQL*Plus user interfaces.

In command-line SQL*Plus, you type commands at the SQL*Plus prompt. Usually, you separate the words in a command from each other by a space or 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 in either the command-line or the iSQL*Plus user interfaces:

- 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.

You can use the Backspace and the Delete keys in both command-line SQL*Plus and iSQL*Plus. In iSQL*Plus, you can cut and paste using your web browser's edit keys to edit the statements in the Input area. You can also cut or copy scripts or statements from other applications such as text editors, and paste them directly into the Input area.

In iSQL*Plus, the Save Script button enables you to save scripts to a text file. You can also load scripts with the Load Script button. Saving and loading scripts may be useful when editing and testing.

The SQL Buffer

The area where SQL*Plus stores your most recently entered SQL command or PL/SQL block (but not SQL*Plus commands) is called the *SQL buffer*. The command or block remains there until you enter another. If you want to edit or re-run the current SQL command or PL/SQL block, you may do so without re-entering it. For more information about editing or re-running a command or block stored in the buffer see "[Running Scripts](#)" on page 6-14.

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 a SQL or PL/SQL statement at the end of the Input area, even if it is incomplete or does not have a final ";" or "/". If you intend to run iSQL*Plus scripts in the SQL*Plus command-line, you should make sure you use a ";" or "/" to terminate your statements.

iSQL*Plus retains the state of your current system variables and other options from one execution to the next. 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"](#) for a list of SQL*Plus commands not supported in iSQL*Plus.

Running SQL Commands

The SQL command language enables you to manipulate data in the database. See your *Oracle9i SQL Reference* for information on individual SQL commands.

Example 5–1 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 will display a “2”, the prompt for the second line. 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. SQL*Plus processes the command and displays the results on the screen:



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 displays the command prompt again. If you made a mistake and therefore did not get the results shown above, simply re-enter the command.

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 will need to adjust a system variable called LINESIZE, which sets the width of the output in characters, see "[Setting Page Dimensions](#)" on page 7-31. Typically, in the examples in this guide this is set to 70 characters. You may need to SET LINESIZE to 70 so the query output appears the same as in this guide. Whether you see the message concerning the number of records retrieved depends on the setting of a system variable called FEEDBACK. You will learn more about system variables in "[System Variables that Affect How Commands Run](#)". To save space, the number of records selected will not be shown in the rest of the examples in this guide.

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 between lines. Thus, you can enter the query you entered in [Example 5-1, "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 5-1, "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 5-1, "Entering a SQL Command"](#), and press Return. SQL*Plus will process the command and store it in the SQL buffer (see ["The SQL Buffer"](#) 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. Type the semicolon and press Return again to run the command.

Note: You cannot enter a comment on the same line after a semicolon. For more information about placing comments, see ["Placing Comments in Scripts"](#) on page 6-10.

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. Type a slash and press Return again. SQL*Plus executes the command and stores it in the buffer (see ["The SQL Buffer"](#) for details).

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.

Note: You can change the way blank lines appear and behave in SQL statements using the SET SQLBLANKLINES command. For more information about changing blank line behavior, see the [SET](#) command on page 13-95.

Press Return again; SQL*Plus now prompts you with the SQL*Plus command prompt. SQL*Plus does not execute the command, but stores it in the SQL buffer (see "[The SQL Buffer](#)" for details). If you subsequently enter another SQL command, SQL*Plus overwrites the previous command in the buffer.

Creating Stored Procedures Stored procedures are PL/SQL functions, packages, or procedures. To create stored procedures, you use SQL CREATE commands. The following SQL CREATE commands are used to create stored procedures:

- 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](#)". 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
```

For more information about the [SHOW](#) command, see [Chapter 13, "SQL*Plus Command Reference"](#).

To execute a PL/SQL statement that references a stored procedure, you can use the EXECUTE command. EXECUTE runs the PL/SQL statement that you enter immediately after the command. For example:



```
EXECUTE :ID := EMPLOYEE_MANAGEMENT.GET_ID('BLAKE')
```

For more information about the [EXECUTE](#) command, see [Chapter 13, "SQL*Plus Command Reference"](#).

Executing the Current SQL Command or PL/SQL Block from the Command Prompt

You can run (or re-run) the current SQL command or PL/SQL block by entering the RUN command or the slash (/) command at the command prompt. The RUN command lists the SQL command or PL/SQL block in the buffer before executing the command or block; the slash (/) command simply runs the SQL command or PL/SQL block.

Running PL/SQL Blocks

You can also use PL/SQL subprograms (called *blocks*) to manipulate data in the database. See your *PL/SQL User's Guide and Reference* for information on individual PL/SQL statements.

To enter a PL/SQL subprogram in SQL*Plus, you need to be in PL/SQL mode. You are placed in PL/SQL mode when

- You type DECLARE or BEGIN at the SQL*Plus command prompt. 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 FUNCTION) that creates a stored procedure. After you enter PL/SQL mode in this way, type the stored procedure you want to create.

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.

SQL*Plus stores the subprograms you enter at the SQL*Plus command prompt in the SQL buffer. Execute the current subprogram by issuing a RUN or slash (/) command. Likewise, to execute a SQL CREATE command that creates a stored

procedure, you must also enter RUN or slash (/). A semicolon (;) will not execute these SQL commands as it does other SQL commands.

SQL*Plus sends the complete PL/SQL subprogram to Oracle for processing (as it does SQL commands). See your *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;
/

```

When you run a subprogram, the SQL commands within the subprogram may behave somewhat differently than they would outside the subprogram. See your *PL/SQL User's Guide and Reference* for detailed information on the PL/SQL language.

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. For information on individual SQL*Plus commands, see [Chapter 13, "SQL*Plus Command Reference"](#).

To speed up command entry, you can abbreviate many SQL*Plus commands to one or a few letters. Abbreviations for some SQL*Plus commands are described along with the commands in [Chapter 3, "Configuring SQL*Plus"](#), [Chapter 5, "SQL*Plus Basics"](#), and [Chapter 6, "Using Scripts in SQL*Plus"](#). For abbreviations of all SQL*Plus commands, see [Chapter 13, "SQL*Plus Command Reference"](#).

Example 5–2 Entering a SQL*Plus Command

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. On the command-line, 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 RUN command to re-run the most recent query (from Example 2-3):



```
RUN
```



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. The RUN command then re-ran the query of [Example 5–1, "Entering a SQL Command"](#), which was stored in the buffer. SQL*Plus does not store SQL*Plus commands in the SQL buffer.

Understanding SQL*Plus Command Syntax

SQL*Plus commands have a different syntax from SQL commands or PL/SQL blocks.

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.

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.

Ending a SQL*Plus Command You do not need to end a SQL*Plus command with a semicolon. When you finish entering the command, you can just press Return. If you wish, however, you can enter a semicolon at the end of a SQL*Plus command.

System Variables that Affect How Commands Run

The SQL*Plus command SET controls many variables—called SET variables or system variables—the settings of 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. System variables are also called *SET variables*.

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.)

For more information on system variables and their default settings, see the [SET](#) command on page 13-95. For details on the SQL*Plus LOGIN file, refer to "[SQL*Plus Configuration](#)" on page 3-2 and to "[The SQLPLUS Command](#)" on page 4-3.

To list the current setting of a SET command variable, enter SHOW followed by the variable name at the command prompt. See the [SHOW command](#) on page 13-124 for information on other items you can list with SHOW.

Saving Changes to the Database Automatically

Through the SQL DML commands UPDATE, INSERT, and DELETE—which can be used independently or within a PL/SQL block—specify changes you wish to make to the information stored in the database. These changes are not made permanent until you enter a SQL COMMIT command or a SQL DCL or 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 SET command's AUTOCOMMIT variable.

Example 5–3 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
```

For more information, see the AUTOCOMMIT variable of the [SET](#) command on page 13-95.

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 and returns to the command prompt.

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 7, "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 Host Operating System Commands

You can execute a host operating system command from the SQL*Plus command prompt. This is useful when you want to perform a task such as listing existing host operating system files.

To run a host operating system command, enter the SQL*Plus command HOST followed by the host operating system command. For example, this SQL*Plus command runs a host command, DIRECTORY *.SQL:



```
HOST DIRECTORY *.SQL
```

When the host 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 effect the current SQL*Plus session. For example, setting an operating system environment variable does not effect the current SQL*Plus session, but may effect SQL*Plus sessions started subsequently.

You can suppress access to the HOST command. For more information about suppressing the HOST command see [Chapter 10, "SQL*Plus Security"](#).

Getting Help

While you use SQL*Plus, you may find that you need to list column definitions for a table, or start and stop the display that scrolls by. You may also need to interpret error messages you receive when you enter a command incorrectly or when there is a problem with Oracle or SQL*Plus. The following sections describe how to get help for those situations.

Listing a Table Definition

To see the definitions of each column in a given table or view, use the SQL*Plus DESCRIBE command.

Example 5–4 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 data dictionary. You can also use SQL SELECT commands to access this and other information in the database. See your *Oracle9i SQL Reference* for details.

Listing PL/SQL Definitions

To see the definition of a function or procedure, use the SQL*Plus DESCRIBE command.

Example 5–5 Using the DESCRIBE Command

To list the definition of a function called AFUNC, enter



```
DESCRIBE afunc
```



```
FUNCTION afunc RETURNS NUMBER
Argument Name      Type      In/Out   Default?
-----
F1                CHAR      IN
F2                NUMBER    IN
```

Controlling the Display

Suppose that you wish to stop and examine the contents of the screen while displaying a long report or the definition of a table with many columns. The display will pause while you examine it. To continue, press Resume.

If you wish, you can use the PAUSE variable of the SQL*Plus SET command to have SQL*Plus pause after displaying each screen of a query or report. For more information, refer to the [SET](#) command on page 13-95.

Interpreting Error Messages

If SQL*Plus detects an error in a command, it displays an error message. See [Chapter 14, "SQL*Plus Error Messages"](#) for a list of SQL*Plus error messages.

Example 5–6 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 "employees.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 [Chapter 14, "SQL*Plus Error Messages"](#) of this guide.
- If the error is a numbered error beginning with the letters “CPY” look up the SQL*Plus COPY command message in [Chapter 14, "SQL*Plus Error Messages"](#) of this guide.
- If the error is a numbered error beginning with the letters “ORA”, look up the Oracle message in the *Oracle9i Database Error Messages* guide or in the Oracle installation and user’s guides provided for your operating system.

If the error is unnumbered, look up correct syntax for the command that generated the error in [Chapter 13, "SQL*Plus Command Reference"](#) of this guide for a SQL*Plus command, in the *Oracle9i SQL Reference* for a SQL command, or in the *PL/SQL User’s Guide and Reference* for a PL/SQL block. Otherwise, contact your DBA.

6

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](#)
- [Modifying Scripts](#)
- [Editing Scripts in SQL*Plus](#)
- [Placing Comments in Scripts](#)
- [Running Scripts](#)
- [Nesting Scripts](#)
- [Receiving a Return Code](#)
- [Exiting from a Script with a Return Code](#)
- [Writing Interactive Commands](#)
- [Using 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 [Chapter 1, "SQL*Plus Overview"](#).

Editing Scripts

In command-line SQL*Plus, 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, and which can be executed in either command-line or iSQL*Plus user interfaces. This is especially useful for storing complex commands or frequently used reports.

You can load any valid SQL script into iSQL*Plus that you can access from your workstation. Some web browsers may require you to create a MIME type or application association for files with a .SQL extension in order to load them into iSQL*Plus. See "[Adding MIME Types](#)" on page 3-5 for information on how to create a MIME or application association.

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 host operating system's default text editor without leaving SQL*Plus 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 Configuration](#)" on page 3-2, and the [DEFINE](#) and [EDIT](#) commands in [Chapter 13, "SQL*Plus Command Reference"](#) 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.

You must include a semicolon at the end of each SQL command and a period on a line by itself after each PL/SQL block in the file. (You can include multiple SQL commands and PL/SQL blocks.)

Example 6–1 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, you must invoke your editor and create a file to hold your script:



```
EDIT SALES
```

You can enter SQL*Plus, SQL and PL/SQL statements and commands. 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 zero in 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 [Chapter 5, "SQL*Plus Basics"](#) and in the *Oracle9i SQL Reference*.

Now use your editor's save command to store your query in a file called SALES.SQL:



Modifying Scripts

You can modify an existing script using the EDIT command. To edit an existing script with the EDIT command, follow the word EDIT with the name of the file.

For example, to edit an existing file named PROFIT that has the extension SQL, enter the following command:



```
EDIT PROFIT
```

Remember that EDIT assumes the file extension SQL if you do not specify one.

Editing Scripts in SQL*Plus

Because SQL*Plus does not store SQL*Plus commands in the buffer, you edit a SQL*Plus command entered directly at the command prompt by using Backspace or by re-entering the command.

You can use a number of SQL*Plus commands to edit the SQL command or PL/SQL block currently stored in the buffer. Alternatively, you can use a host operating system editor to edit the buffer contents.

Table 6–1 lists the SQL*Plus commands that allow you to examine or change the command in the buffer without re-entering the command.

Table 6–1 SQL*Plus Editing Commands

Command	Abbreviation	Purpose
APPEND <i>text</i>	A <i>text</i>	adds <i>text</i> at the end of a line
CHANGE / <i>old/new</i>	C / <i>old/new</i>	changes <i>old</i> to <i>new</i> in a line
CHANGE / <i>text</i>	C / <i>text</i>	deletes <i>text</i> from a 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</i> <i>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	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

Table 6–1 SQL*Plus Editing Commands

Command	Abbreviation	Purpose
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 6–2 Listing the Buffer Contents

Suppose you want to list the current command. Use the LIST command as shown below. (If you have exited SQL*Plus or entered another SQL command or PL/SQL block since following the steps in [Example 5–1, "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 mark the end of the command when you enter it, but SQL*Plus does not store it in the SQL buffer. This makes editing more convenient, since it means you can append a new line to the end of the buffer without removing a semicolon.

Editing the Current Line

The SQL*Plus CHANGE command allows 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 6–3 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. Re-enter the line by typing the line number followed by a space and the new text and pressing Return.

Example 6–4 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 5–2, "Entering a SQL*Plus Command"](#). (If you have left SQL*Plus and started again since performing [Example 5–2, "Entering a SQL*Plus Command"](#) the column has reverted to its original format.)

For information about the significance of case in a CHANGE command and on using wildcards to specify blocks of text in a CHANGE command, refer to the [COLUMN command](#) on page 13-29.

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 that line becomes line 1.



```
0 SELECT EMPLOYEE_ID
```

Example 6–5 Adding a Line

Suppose you want to add a fourth line to the SQL command you modified in [Example 6–4, "Correcting the Error"](#). Since line 3 is already the current line, enter INPUT (which may be abbreviated to I) 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

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 just 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 6–6 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

Deleting Lines

To delete lines in the buffer, use the DEL command.

1. Use the LIST command (or just the line numbers) to list the lines you want to delete.
2. Enter DEL with an optional clause.

Suppose you want to delete the current line to the last line inclusive. Use the DEL command as shown below.



DEL * LAST

DEL makes the following line of the buffer (if any) the current line.

For more information, see the [DEL command](#) on page 13-51.

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.

For further information about using comments in scripts, see "[Notes on Placing Comments](#)".

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, otherwise the comment is treated as a command, and the slash is interpreted as an execute command, executing any command in the SQL*Plus buffer.

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'

```

If you enter a SQL comment directly at the command prompt, SQL*Plus does not store the comment in the buffer.

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 generally does not parse or execute input it identifies as a comment.

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');
```

Warning: Procedure created with compilation errors.

The location of the comment prevents SQL*Plus from recognizing the command as a PL/SQL command. SQL*Plus submits the 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.

2. 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 statement terminators on the same line and is unable to recognize the comment.

3. 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.

4. 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;
```

It prompts for the value of &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.
```

SQL*Plus interprets text after the ampersand character “&” as a substitution variable and prompts for the value of the variable. 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 13-95.

Running Scripts

The START command retrieves a script and runs the command(s) 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`

If the file has the extension SQL, you need not add the period and the extension SQL to the filename.

Example 6–7 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

To see the commands as SQL*Plus “enters” them, you can set the ECHO variable of the SET command to ON. The ECHO variable controls the listing of the commands in scripts run with the START, @ and @@ commands. Setting the ECHO variable to OFF suppresses the listing.

You can also use the @ (“at” sign) command to run a script:



`@SALES`

The @ command lists and runs the commands in the specified script in the same manner as START. SET ECHO affects the @ command as it affects the START command.

START, @ and @@ leave the last SQL command or PL/SQL block in 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 four options:

- Follow the SQLPLUS command with your username, a slash, your password, a space, @, and the name of the file:



```
SQLPLUS HR/your_password @SALES
```

SQL*Plus starts and runs the script.

- Follow the SQLPLUS command and your username with a space, @, and the name of the file:



```
SQLPLUS HR @SALES
```

SQL*Plus prompts you for your password, starts, and runs the script.

- Include your username as the first line of the file. Follow the SQLPLUS command with @ and the filename. SQL*Plus prompts for your password, starts, and runs the file.
- Include your username, a slash (/), and your password as the first line of the file. Follow the SQLPLUS command with @ and the filename. SQL*Plus starts and runs the file. Please consider the security risks of exposing your password in the file before using this technique.

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](#) in [Chapter 13, "SQL*Plus Command Reference"](#) for more information.

Receiving a Return Code

If you fail to log in successfully to SQL*Plus because your username or password is invalid or some other error, SQL*Plus will return an error status equivalent to an EXIT FAILURE command. See the EXIT command in this chapter for further information.

Example 6–8 Starting SQL*Plus

To start SQL*Plus with *username* HR and *password* *your_password*, enter



```
SQLPLUS HR/your_password
```

To start SQL*Plus, as above, and to make POLICY the default database (where POLICY is a valid Oracle Net database connect identifier), enter



```
SQLPLUS HR/your_password@POLICY
```

To start SQL*Plus with *username* HR and *password* *your_password* and run a script named STARTUP with the extension SQL, enter



```
SQLPLUS HR/your_password @STARTUP
```

Note the space between HR and @STARTUP.

To start SQL*Plus with HTML ON, so that output can be captured in a file and then viewed on a web browser, enter



```
SQLPLUS -M "HTML ON" HR/your_password
```

To start SQL*Plus with no access to the EDIT and HOST commands during the session, enter



```
SQLPLUS -R 1 HR/your_password
```

Example 6–9 Displaying the SQLPLUS syntax

To display the syntax of the SQLPLUS command, enter



```
SQLPLUS -H
```



```
Usage: SQLPLUS [ [<option>] [<logon>] [<start>] ]
where <option> ::= -H | -V | [[-L] [-M <o>] [-R <n>] [-S] ]
      <logon> ::= <username>[/<password>][@<connect_string>] | / | /NOLOG
      <start> ::= @<URL>|<filename>[.<ext>] [<parameter> ...]
      -H displays the SQL*Plus version banner and usage syntax
      -V displays the SQL*Plus version banner
```

```
-L attempts logon just once  
-M <o> uses HTML markup options <o>  
-R <n> uses restricted mode <n>  
-S uses silent mode
```

Exiting from a Script with a Return Code

If your script generates a SQL error while running from a batch file on the host operating system, you may want to abort the script and exit with a return code. Use the SQL*Plus command **WHENEVER SQLERROR** to do this; see the [WHENEVER SQLERROR](#) command on page 13-154 for more information.

Similarly, the **WHENEVER OSERROR** command may be used to exit if an operating system error occurs. See the [WHENEVER OSERROR](#) command on page 13-152 for more information.

Writing Interactive Commands

The following features of SQL*Plus make it possible for you to set up scripts that allow end-user input:

- defining user variables
- substituting values in commands
- using the START command to provide values
- prompting for values

Defining User Variables

You can define variables, called *user variables*, for repeated use in a single script by using the SQL*Plus **DEFINE** command. Note that you can also define user 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 6–10 Defining a User Variable

To define a user 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 user variable definitions, enter `DEFINE` by itself at the command prompt. Note that any user 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 user variable of datatype `NUMBER` implicitly through the `ACCEPT` command. You will learn more about the `ACCEPT` command later in this chapter.

To delete a user variable, use the `SQL*Plus` command `UNDEFINE` followed by the variable name.

Using Substitution Variables

Suppose you want to write a query like the one in `SALES` (see [Example 6-1, "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 `CHAR` 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 value `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 a user variable name 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 at the command prompt. 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.

You should avoid creating substitution 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 substitution variable matches a variable name, then the contents of the matching variable are used instead of the supplied value.

Example 6–11 Using Substitution Variables

Create a script named STATS, to be used to calculate a subgroup statistic (the maximum value) on a numeric column:

```


CLEAR BUFFER
INPUT
    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

JOB_ID	MAXIMUM
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 6–11](#), 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 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*.

Example 6–12 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* 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, such as in SQL*Plus comments (REMARK, /*... */ or --). The buffer editing commands, APPEND, CHANGE, and INPUT, treat text beginning with “&” or “&&” literally, as any other text string.

System Variables

The following system variables, specified with the SQL*Plus SET command, affect substitution variables:

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 VERIFY ON	Lists each line of the script before and after substitution.
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 (.)

For more information about system variables, see the [SET](#) command on page 13-95.

Substitution Variables in *iSQL*Plus*

System variables specified with the SET command can affect *iSQL*Plus* behavior. SET DEFINE, SET ESCAPE, SET VERIFY ON, and SET CONCAT affect variable substitution behavior, and should be set in *iSQL*Plus* before attempting to execute a script. For further information about these SET options, see the [SET command](#) on page 13-95.

*iSQL*Plus* preprocesses a script for '&' and '&&' variables, and prompts the user for their values before sending the script to the SQL*Plus engine for execution. You should synchronize variable substitution with one of the two following options:

- Enter SET DEFINE 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. Do not use DEFINE, or UNDEFINE. Click the Execute button to execute the script.

*iSQL*Plus* prompts you for values for all the substitution variables in your script. At the end of script execution, any double ampersand values contained in the script remain defined. This means that you will not be 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 a single ampersand as the prefix for variables in your script. You are always prompted for value substitution for variables created with a single ampersand prefix. If you use DEFINE to define variable values in your script in this mode, the defined values override values entered in the Variable Substitution screen.

- Enter SET DEFINE OFF to set *iSQL*Plus* to never prompt for substitution variables before running any further scripts. Click the Execute button to execute the command.

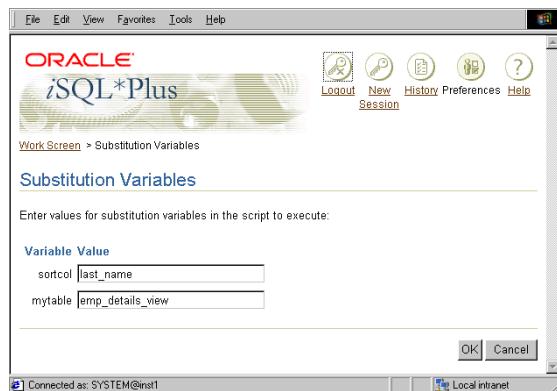
Enter your script. Ensure that you include SET DEFINE OFF as the last command in your script to make sure that *iSQL*Plus* does not prompt for variable values when the script is executed again. Enter SET DEFINE ON, and DEFINE all variables with '&' or '&&' before they are referenced. You can also use COLUMN ... *new_value* or COLUMN ... *old_value* to instantiate substitution variables. Click the Execute button to execute the script. *iSQL*Plus* does not prompt you for values for substitution variables. In this usage, be aware that *iSQL*Plus* substitutes a NULL value for any variable you do not DEFINE in the script.

iSQL*Plus Substitution Variables Screen

When iSQL*Plus executes a script containing substitution variables, the Substitution Variables screen is displayed. For example, when you enter:

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

iSQL*Plus displays:



Variable Displays the substitution variable names.

Value Enter a value for each substitution variable. For example, enter LAST_NAME in the *sortcol* field, and EMP_DETAILS_VIEW in the *mytable* field of the example script.

OK Click the OK button to execute the script in the Input area with the substitution variable values you entered.

Cancel Click the Cancel button to return to the Work screen without executing the script in the Input area.

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 CLERK for &1 and 7900 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 6–13 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 any number of parameters in a script. Within a script, you can refer to each parameter any number of times, and can include the parameters in any order.

Note: You cannot use parameters when you run a command with RUN or slash (/). You must store the command in a script and run it with START or @.

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.

Prompting for and Accepting User Variable

Through PROMPT and ACCEPT, you can send messages to the end user and accept values as end-user input. PROMPT displays a message you specify on-screen; use it to give directions or information to the user. ACCEPT prompts the user for a value and stores it in the user variable you specify. Use PROMPT in conjunction with ACCEPT when your prompt for the value spans more than one line.

Example 6-14 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:



```
INPUT
```



```
4  PROMPT Enter a title of up to 30 characters
5  ACCEPT MYTITLE PROMPT 'Title: '
6  TTITLE LEFT MYTITLE SKIP 2
7  SELECT EMPLOYEE_ID, FIRST_NAME, LAST_NAME, SALARY
8  FROM EMP_DETAILS_VIEW
9  WHERE JOB_ID='SA_MAN'
10
```



```
SAVE PROMPT1
```



Created file PROMPT1.sql

The TTITLE command sets the top title for your report. For more information about the TTITLE command, see "[Defining Page and Report Titles and Dimensions](#)" on page 7-23.



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 6–15 Using PROMPT and ACCEPT in Conjunction with Substitution Variables

As you have seen in [Example 6–14](#), 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 enter 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.



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



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

Suppose that you want to be able to display the variables you use in your PL/SQL subprograms in SQL*Plus or use the same variables in multiple subprograms. If you declare a variable in a PL/SQL subprogram, you cannot display that variable in SQL*Plus. Use a bind variable in PL/SQL to access the variable from SQL*Plus.

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. For more information, see the [VARIABLE command](#) on page 13-145. (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:



```
VARIABLE ret_val NUMBER
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`. For more information about displaying bind variables, see the [PRINT command](#) on page 13-77.

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 allows 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.

Note: You must have Oracle7, Release 7.3 or above to assign the return value of a stored function to a REFCURSOR variable.

Example 6-16 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 *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 6–17 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 cv_types AS
TYPE EmpInfoTyp is REF CURSOR RETURN emp%ROWTYPE;
END cv_types;
/
Package created.
```

Next, create the stored procedure containing an OPEN... FOR SELECT statement.

```

CREATE OR REPLACE PROCEDURE EmpInfo_rpt
(emp_cv IN OUT cv_types.EmpInfoTyp) AS
BEGIN
OPEN emp_cv FOR SELECT EMPLOYEE_ID, SALARY FROM EMP_DETAILS_VIEW -
WHERE JOB_ID='SA_MAN' ;
END;
/
Procedure created.
```

Execute the procedure with a SQL*Plus bind variable as the parameter.

```
VARIABLE odcv REFCURSOR
```

 EXECUTE EmpInfo_rpt(:odcv)
PL/SQL procedure successfully completed.

Now print the bind variable.

 PRINT odcv

 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 6–18 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.



```
PRINT rc
```



EMPLOYEE_ID	SALARY
145	14000
146	13500
147	12000
148	11000
149	10500

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 [Chapter 1, "SQL*Plus Overview"](#).

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 13-29 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 7-1 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 13-95 for more information.)

Example 7-2 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 7-3 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. The sections below describe the default display and how you can alter the default 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.

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 below:

```
COLUMN column_name FORMAT model
```

Use format models to add commas, dollar signs, angle brackets (around negative values), and/or 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 7-4](#)). For a complete list of format models and further details, see the [COLUMN](#) command on page 13-29.

Example 7-4 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 above, 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 derived from the NLS parameters in effect. Otherwise, the default format width is A9. For more information on formatting DATE columns, see the FORMAT clause of the [COLUMN command](#) on page 13-29.

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 13-29 for more details.

Example 7–5 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	MONTHLY	
NAME	SALARY	COMMISSION
Russ	\$14,000	.4
ell		
Part	\$13,500	.3
ners		
Erra	\$12,000	.3
zuri		
z		

LAST	MONTHLY	
NAME	SALARY	COMMISSION
Camb	\$11,000	.3
raul		
t		
Zlot	\$10,500	.2
key		

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 7–5](#). 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 13-29 for more information on these clauses. You will use the WORD_WRAPPED clause of COLUMN later in this chapter.

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 7–6 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
```



```
Building
-----
Owned
```

For more information about the `createXML`, `extract`, `text` and `getStringVal` functions, and about creating and manipulating `XMLType` data, see *Oracle9i XML API Reference - XDK and Oracle XML DB* and *Oracle9i XML Case Studies and Applications*.

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 7-7 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 below:



```
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 below:



```
COLUMN column_name CLEAR
```

Example 7–8 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 below:

```
COLUMN column_name WORD_WRAPPED
```

Example 7–9 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 and/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 (and/or average, maximum, minimum, standard deviation, variance, or count of rows) of salary for each department and for all departments.

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 7-10 Suppressing Duplicate Values in a Break Column

To suppress the display of duplicate department numbers in the query results shown above, 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	14000
	Partners	13500
90	King	24000
	Kochhar	17000
	De Haan	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 7-11 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	14000
	Partners	13500
90	King	24000
	Kochhar	17000
	De Haan	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 7–12 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:



DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY
20	MK_MAN	Hartstein	13000

DEPARTMENT_ID	JOB_ID	LAST_NAME	SALARY
80	SA_MAN	Russell	14000
		Partners	13500

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 about the COMPUTE command, see [Chapter 13, "SQL*Plus Command Reference"](#).

The following table lists compute functions and their effects

Table 7-1 Compute Functions

Function	Effect
SUM	Computes the sum of the values in the column.
MINIMUM	Computes the minimum value in the column.
MAXIMUM	Computes the maximum value in the column.
AVG	Computes the average of the values in the column.
STD	Computes the standard deviation of the values in the column.
VARIANCE	Computes the variance of the values in the column.
COUNT	Computes the number of non-null values in the column.
NUMBER	Computes the 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 13-40 for more details. Note that if you use the NOPRINT option for the column on which the COMPUTE is being performed, the COMPUTE result is also suppressed.

Example 7-13 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.

The format of the column SALARY controls the appearance of the sum of SALARY, as well as the individual values of SALARY. 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 7-14 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 7–15 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 7–14](#) 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 7–16 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
	Raphaelly	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 7-17 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](#) and [REPHEADER](#) commands in [Chapter 13, "SQL*Plus Command Reference"](#).

Example 7-18 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 7-19 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 linesize 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 7-20 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 7-21 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 user 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). For a list of system-maintained values you can display in titles, see the **TTITLE** command on page 13-141.

Example 7-22 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 7-23 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 below. 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 7-24 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.

To create the variable (in this example named `_DATE`), you can add the following commands to your SQL*Plus LOGIN file:



```
BREAK ON TODAY
COLUMN TODAY NEW_VALUE _DATE
SELECT TO_CHAR(SYSDATE, 'fmMonth DD, YYYY') TODAY
FROM DUAL;
CLEAR BREAKS
```

When you start SQL*Plus, these commands place the value of SYSDATE (the current date) into a variable named `_DATE`. To display the current date, you can reference `_DATE` in a title as you would any other variable.

The date format model you include in the SELECT command in your LOGIN file determines the format in which SQL*Plus displays the date. See your *Oracle9i SQL Reference* for more information on date format models. For more information about the LOGIN file, see "[Modifying Your LOGIN File](#)" on page 3-3.

You can also enter these commands interactively at the command prompt. For more information, see the [COLUMN](#) command on page 13-29.

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 below:

- number of lines before the top title: 1
- number of lines per page, from the top title to the bottom of the page: 24
- 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 linesize to center a title properly over your output, or you may want to increase linesize 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 7-25 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 linesize 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 24
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, memo, 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 host operating system; on most hosts it is LST or LIS. See the Oracle

installation and user's manual(s) 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 Oracle8 to Oracle9*i*.

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 13-95.

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 host computer's standard (default) printer. SPOOL OUT does not delete the spool file after printing.

Example 7–26 Sending Query Results to a Printer

To generate a final report and spool and print the results, create a script named EMPPRPT containing the following commands.

First, use EDIT to create the script with your host operating system text editor.



EDIT EMPPRPT

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.

8

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](#)

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 [Chapter 1, "SQL*Plus Overview"](#).

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 command in the "[SQL*Plus Command Summary](#)" section and the [SET MARKUP](#) command on page 13-112 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 allows you to easily identify the type of your output files, and also allows 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 8–1 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:

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: #FFFC6} --> </STYLE>
<meta name="generator" content="SQL*Plus 9.2.0.1.0">
</head>
<body TEXT="#FF00FF">
SQL&gt; SELECT '&lt;A HREF="http://oracle.com/' || DEPARTMENT_
NAME || '.html"' || DEPARTMENT_NAME || '&lt;/A&gt;' DEPARTMENT_NAME, CITY
<br>
      2  FROM EMP_DETAILS_VIEW
<br>
      3* WHERE SALARY>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.<br>

SQL&gt; spool off
<br>
</body>
</html>
```

Example 8-2 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/your_password@Ora9i  
@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”, 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 "[Creating Reports with CGI Scripts](#)" 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.

Creating Reports with CGI Scripts

The SQLPLUS -MARKUP command allows you to start a SQL*Plus session in 'markup mode', rather than using the SET MARKUP command interactively. This allows you to run a SQL*Plus session embedded inside a Common Gateway Interface (CGI) script. A file created in this way can be displayed directly in a web browser. You can call SQL*Plus using any script language which is supported by your web server, such as a UNIX shell script, a Windows batch file, Java, JavaScript or a Perl script.

You can use this embedded approach to produce web pages that use existing SQL*Plus scripts without change. It provides an easy way to provide dynamically-created, web-based reports.

Example 8–3 Creating a Report from a CGI Script

You can use a CGI script to run SQL*Plus, and so produce a web report from a SQL script. There are three main elements required:

- A web page to call and pass parameters to the CGI script.
- A CGI script to gather the input and run SQL*Plus.
- The SQL script to be run by the SQL*Plus session.

Web Page for CGI Example

In this example, the web page is an HTML form, with fields for a username and password, a database connection string and the name of the SQL script to run.

Note: You need to carefully consider security on your server before embedding login information in a script file, or using a CGI script to prompt for login information and pass it into the SQLPLUS command.

Consider setting initial conditions rather than assuming default values. For example, explicitly set ENTMAP ON even though its default is ON.

Create an HTML file containing the following script and save it as *plus.html*.



```
<html>
<head><title>SQL*Plus CGI Report</title></head>
<body bgcolor="#ffffff">

<h1>SQL*Plus CGI Report</h1>

<!-- Change the URL here. On Windows NT you may need to use
http://machine_name.domain:port/cgi-bin/perl?plus.pl if your web server is
not configured to identify the script as a Perl program -->

<form method=post action="http://machine_name.domain:port/cgi-bin/plus.pl">
<table border=0 summary="">

<tr>
  <td>Username:</td>
  <td><input type="text" name="username" size="10" align="left"></td>
</tr>
<tr>
  <td>Password:</td>
  <td><input type="password" name="password" size="10" align="left"></td>
</tr>
<tr>
  <td>Connect string:</td>
  <td><input type="text" name="db" size="10" align="left"></td>
</tr>
<tr>
  <td>Report to run:</td>
  <td><input type="text" name="script" value="employee.sql" size=40></td>
</tr>
<tr>
  <td><input type="submit" value="Run it">&nbsp;<input type="reset"
value="Reset Form"></td>
  <td>&nbsp;</td>
</tr>
</table>
</form>
</body>
</html>
```

Perl Script for CGI Example

In this example, the CGI script is a Perl script, but it could be a shell script, a Java class or any other language supported by your web server. Create the following Perl CGI script and save it as *plus.pl* in the *cgi-bin* directory of your web server:



```
#! /usr/local/bin/perl -w
```

```
# Copyright (c) Oracle Corporation 1999, 2002. All Rights Reserved.  
# NAME  
#   plus.pl  
# DESCRIPTION  
#   This is a demonstration program to run a SQL*Plus report via CGI.  
#   It is provided as is with no warranty implied or expressed.  
#   Users are strongly recommended to understand error handling and  
#   security issues before implementing CGI scripts.  
#  
# NOTES  
#   This demonstration requires that SQL*Plus 9.2.0 (or later) is  
#   installed on your web server, and the web server is configured to  
#   run CGI programs. The database may be on another machine, but  
#   must have Oracle Net access configured.  
#  
#   This demonstration consists of three files:  
#       plus.html      - Sample HTML form that you open in your web  
#                         browser. It calls plus.pl to run employee.sql  
#       plus.pl        - Sample CGI program to run SQL*Plus  
#       employee.sql  - Sample SQL script to generate a report from  
#                         the HR sample schema.  
#   These scripts need to be customized for your site.  
#  
# INSTALLATION INSTRUCTIONS:  
#   1. Put plus.pl (this file) in the cgi-bin directory of your  
#      web server and edit the environment variable section at the top  
#      of the file. Make the program executable, for example on UNIX,  
#      chmod +x plus.pl  
#      You may need to customize the top line of this script to point  
#      to the Perl installation on your machine, and in the syntax  
#      required for your operating system.  
#   2. Put employee.sql in the cgi-bin directory too.  
#   3. Put plus.html in a directory you can access from the web.  
#      Edit plus.html to change the form URL to that of your web server.  
#   4. Open plus.html in your browser and enter the fields. As  
#      this demonstration uses the view, EMP_DETAILS_VIEW, from the HR  
#      sample schema, enter the associated username, HR, and password.  
#      If your database is not the default, or is on another machine,  
#      enter a valid network alias, or full connection identifier in  
#      the Connect Identifier field, otherwise leave it blank. If  
#      employee.sql is in your cgi-bin directory, you will probably  
#      not need to specify a path, otherwise specify a machine path  
#      and filename.  
  
$debug = 0;    # Set this to 1 to see the form fields values entered.
```

```
# !!! Customize these environment variables and the executable name.  
# !!! On Windows use "$ENV{'ORACLE_HOME'}\\bin\\sqlplus" for the executable.  
  
# Set up the SQL*Plus environment  
$ENV{'ORACLE_SID'} = "Ora9i";           # Your SID goes here  
$ENV{'ORACLE_HOME'} = "/oracle"; # Your Oracle Home directory goes here  
# $ENV{'TNS_ADMIN'} = "/var/opt/oracle";  
$plusexe = "$ENV{'ORACLE_HOME'}/bin/sqlplus";  
  
# Extract parameters and values from data entered through web browser  
$i=>;  
@in = split(/[\&;]/,$i);  
foreach $i (0 .. $#in)  
{ ($key,$val) = split(/=/,$in[$i],2);  
# Change encoding to machine character set  
    $key =~ s/%([A-Fa-f0-9]{2})/pack("c",hex($1))/ge;  
    $val =~ s/%([A-Fa-f0-9]{2})/pack("c",hex($1))/ge;  
# Store the value  
    $in{"$key"} = $val;  
}  
  
# Construct the connection string from values passed in  
$connstr = $in{'username'}. "/" . $in{'password'};  
$connstr = $connstr . "@" . $in{'db'} if ($in{'db'});  
  
# Construct the SQL script to be run  
$script = "@". $in{'script'};  
  
# Force output to be flushed  
$| = 1;  
  
# Print mime type  
print "Content-Type: text/html\n\n";  
  
if ($debug)  
{ print "<html><body>\n";  
    print "$plusexe:$connstr:$script:\n";  
    print "</body></html>\n";  
    exit;  
}  
  
# Call SQL*Plus with the parameters entered from the web browser  
system ("$plusexe -r 3 -s -m \"html on\" $connstr $script");  
exit;
```

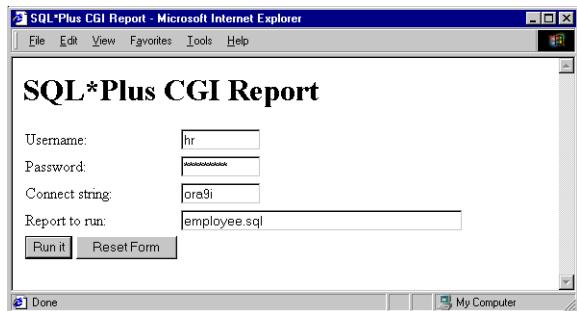
SQL Script for CGI Example

Create the following SQL*Plus script in a text editor and save it as *employee.sql* in the *cgi-bin* directory of your web server:



```
SELECT LAST_NAME, CITY, SALARY
FROM EMP_DETAILS_VIEW;
EXIT;
```

Start your web browser and enter the appropriate URL to open *plus.html*:



Click **Run It** to execute the shell script *plus.pl*, which in turn starts SQL*Plus and runs the *employee.sql* script. The query results are displayed directly in your web browser:

LAST_NAME	CITY	SALARY
King	Seattle	24000
Kochhar	Seattle	17000
De Haan	Seattle	17000
Russell	Oxford	14000
Partners	Oxford	13500
Hartstein	Toronto	13000

6 rows selected.

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 8–1 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, HTTPS 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.

You are not prompted for undefined variables. You should take care that there are no variables that have not been defined in your script, or explicitly passed as parameters.

You can also include username and password information in the request. You should carefully consider the security implications of including usernames and passwords in HTML files. If you do not include a username or password, iSQL*Plus prompts you to enter login information 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.

Example 8–4 Creating a Dynamic Report

Create and save the following script to a file called *script.sql* on your Oracle HTTP 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?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 Oracle HTTP Server. Save the HTML file on your Oracle HTTP Server.

Load the HTML file in your web browser and click on "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 8–5 Creating a Dynamic Report with Parameters

Create and save the following script to a file called *employee_name.sql* on your Oracle HTTP 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><em>i</em>SQL*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"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 port number of your Oracle HTTP Server. Save the HTML file on your Oracle HTTP 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 8–6 Creating a Dynamic Script with Parameters and Login Details

Create and save the following script to a file called `employee_id.sql` on your Oracle HTTP 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">
<INPUT TYPE="hidden" NAME="userid" VALUE="hr/your_password">
<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 port number of your Oracle HTTP Server, and *hr/your_password* with a valid userid and password. Save the HTML file on your Oracle HTTP 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 and displays the results in your web browser.

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](#)
- [System Variables Influencing SQL*Plus Performance](#)
- [iSQL*Plus Server Statistics](#)
- [iSQL*Plus Tuning Notes](#)

For information about tuning Oracle9*i*, see the *Oracle9i Database Performance Tuning Guide and Reference* and *Oracle9i Database Performance Planning*.

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 Report

You can control the report by setting the AUTOTRACE system variable.

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 PLUTRACE role granted to you. DBA privileges are required to grant the PLUTRACE role. For information on how to grant a role and how to create the PLAN_TABLE table, see the *Oracle9i SQL Reference*. For more information about the roles and the PLAN_TABLE, see the *Oracle9i SQL Reference* and the AUTOTRACE variable of the [SET](#) command on page 13-95.

Example 9–1 Creating a PLAN_TABLE

Run the following commands from your SQL*Plus session to create the PLAN_TABLE in the HR schema:



```
CONNECT HR/your_password  
@$ORACLE_HOME/RDBMS/ADMIN/UTLXPLAN.SQL
```



Table created.

Example 9–2 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 9–3 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. 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. For information about interpreting the output of EXPLAIN PLAN, see the *Oracle9i Database Performance Tuning Guide and Reference*.

Statistics

The statistics are recorded by the server when your statement executes and indicate the system resources required to execute your statement.

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.

The results include the following statistics. For a more complete list of database statistics, see the *Oracle9i Database Reference*. For more information about the statistics and how to interpret them, see the *Oracle9i Database Performance Tuning Guide and Reference*.

Database Statistic Name	Description
recursive calls	Number of recursive calls generated at both the user and system level. Oracle maintains tables used for internal processing. When Oracle 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

Database Statistic Name	Description
bytes sent via SQL*Net to client	Total number of bytes sent to the client from the foreground processes.
bytes received via SQL*Net from client	Total number of bytes received from the client over Oracle Net.
SQL*Net roundtrips 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

Example 9–4 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
Kochhar            17000 Administration Vice President
De Haan             17000 Administration Vice President
Russell              14000 Sales Manager
Partners             13500 Sales Manager
Hartstein            13000 Marketing Manager
```

6 rows selected.

Execution Plan

```
0      SELECT STATEMENT Optimizer=CHOOSE
1      0      TABLE ACCESS (BY INDEX ROWID) OF 'EMPLOYEES'
2      1      NESTED LOOPS
3      2          TABLE ACCESS (FULL) OF 'JOBS'
4      2          INDEX (RANGE SCAN) OF 'EMP_JOB_IX' (NON-UNIQUE)
```

Statistics

```
0  recursive calls
2  db block gets
34 consistent gets
0  physical reads
0  redo size
848 bytes sent via SQL*Net to client
503 bytes received via SQL*Net from client
4  SQL*Net roundtrips to/from client
0  sorts (memory)
0  sorts (disk)
6  rows processed
```

Example 9–5 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

```
0      SELECT STATEMENT Optimizer=CHOOSE
1      0      TABLE ACCESS (BY INDEX ROWID) OF 'EMPLOYEES'
2      1      NESTED LOOPS
3      2          TABLE ACCESS (FULL) OF 'JOBS'
4      2          INDEX (RANGE SCAN) OF 'EMP_JOB_IX' (NON-UNIQUE)
```

Statistics

```
0  recursive calls
2  db block gets
34 consistent gets
```

```

0 physical reads
0 redo size
848 bytes sent via SQL*Net to client
503 bytes received via SQL*Net from client
4 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.

Example 9–6 Tracing Statements Using a Database Link

To trace a statement using a database link, enter:



```

SET AUTOTRACE TRACEONLY EXPLAIN
SELECT * FROM EMPLOYEES@MY_LINK;

Execution Plan
-----
0      SELECT STATEMENT (REMOTE) Optimizer=CHOOSE
1      0   TABLE ACCESS (FULL) OF 'EMPLOYEES' MY_LINK.DB_DOMAIN

```

The Execution Plan shows that the table being accessed on line 1 is via the database link MY_LINK.DB_DOMAIN.

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 13-139 and the Oracle installation and user's guide provided for your operating system for more information. See also "[Tracing Statements](#)" for information about using AUTOTRACE to collect statistics.

To delete all timers, enter CLEAR TIMING at the command prompt.

Tracing Parallel and Distributed Queries

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 *Oracle9i Database Performance Tuning Guide and Reference* 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*).

Example 9–7 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

```

0      SELECT STATEMENT Optimizer=CHOOSE (Cost=1 Card=1 Bytes=26)
1      0      SORT (AGGREGATE)
2      1      SORT* (AGGREGATE) :Q2000
3      2      NESTED LOOPS* (Cost=1 Card=41 Bytes=1066) :Q2000
4      3      TABLE ACCESS* (FULL) OF 'D2_T2' (Cost=1 Card=41 Byte :Q2000
           s=533)

5      3          INDEX* (UNIQUE SCAN) OF 'D2_I_UNIQUE1' (UNIQUE) :Q2000

2 PARALLEL_TO_SERIAL      SELECT /*+ PIV_SSF */ SYS_OP_MSR(COUNT(A1.C0
           )) FROM (SELECT /*+ ORDERED NO_EXPAND USE_NL
           (A3) INDEX(A3 "D2_I_UNIQUE1") */ A2.C0 C0,A3
           .ROWID C1,A3."UNIQUE1" C2 FROM (SELECT /*+ N
           O_EXPAND ROWID(A4) */ A4."UNIQUE1" C0 FROM "
           D2_T2" PX_GRANULE(0, BLOCK_RANGE, DYNAMIC) A4)
           A2,"D2_T1" A3 WHERE A2.C0=A3."UNIQUE1")A1

3 PARALLEL_COMBINED_WITH_PARENT
4 PARALLEL_COMBINED_WITH_PARENT
5 PARALLEL_COMBINED_WITH_PARENT

```

Line 0 of the Execution Plan shows the cost based optimizer estimates the number of rows at 1, taking 26 bytes. The total cost of the statement is 1.

Lines 2, 3, 4 and 5 are marked with asterisks, denoting parallel operations. For example, the NESTED LOOPS step (line 3) is a PARALLEL_TO_SERIAL operation. PARALLEL_TO_SERIAL operations execute a SQL statement to produce output serially. Line 2 also shows that the parallel query server had the identifier *Q2000*.

Numbers identifying parallel report lines cross reference the line of the parent report. For example, in the last line of the above example:

```
4 PARALLEL_COMBINED_WITH_PARENT
```

The 4 refers to the "4 3 TABLE ACCESS..." line in the parent report.

Example 9–8 To monitor disk reads and buffer gets.



```
SET AUTOTRACE ON TRACEONLY STATISTICS
```

The following shows typical results:



Statistics

```
70 recursive calls
 0 db block gets
 591 consistent gets
 404 physical reads
 0 redo size
 315 bytes sent via SQL*Net to client
 850 bytes received via SQL*Net from client
 3 SQL*Net roundtrips to/from client
 3 sorts (memory)
 0 sorts (disk)
 0 rows processed
```

If consistent gets or physical reads is 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.

System Variables Influencing SQL*Plus Performance

The following system variables can influence SQL*Plus performance.

SET APPINFO OFF

Sets automatic registering of scripts through the DBMS_APPLICATION_INFO package. Setting APPINFO OFF disables the registering and monitoring of performance and resource usage of scripts. This reduction in overheads may improve performance.

SET ARRAYSIZE

Sets the number of rows—called a *batch*—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. ARRSIZE has no effect on the results of SQL*Plus operations other than increasing efficiency.

SET DEFINE OFF

Controls whether SQL*Plus parses scripts for substitution variables. If DEFINE is OFF, SQL*Plus does not parse scripts for substitution variables. If a script does not use substitution variables, setting DEFINE OFF may give some performance gains.

SET FLUSH OFF

SET FLUSH is not supported in *iSQL*Plus*

Controls when output is sent to the user's display device. OFF allows the host operating system to buffer output which may improve performance by reducing the amount of program input and output.

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 SERVEROUTPUT

Controls whether SQL*Plus checks for and displays DBMS output. If SERVEROUTPUT is OFF, SQL*Plus does not check for DBMS output and does not display output after applicable SQL or PL/SQL statements. Suppressing this output checking and display may result in performance gains.

SET TRIMOUT ON

SET TRIMOUT is not supported in *iSQL*Plus*

Determines whether SQL*Plus allows trailing blanks at the end of each displayed line. ON removes blanks at the end of each line, which may improve performance especially when you access SQL*Plus from a slow communications device. TRIMOUT ON does not affect spooled output.

SET TRIMSPOOL ON

SET TRIMSPOOL is not supported in *iSQL*Plus*

Determines whether SQL*Plus allows trailing blanks at the end of each spooled line. ON removes blanks at the end of each line, which may improve performance especially when you access SQL*Plus from a slow communications device. TRIMSPOOL ON does not affect terminal output.

iSQL*Plus Server Statistics

The active statistics from the iSQL*Plus Server Statistics report provide useful feedback for tuning the iSQL*Plus Server.

To run the report, you must have Oracle HTTP Server authentication to access the iSQL*Plus DBA URL, but as there is no connection to a database, no Oracle9*i* login is required. The syntax of the URL to run the iSQL*Plus Server Statistics report is

```
http://machine_name.domain:port/isqlplusdba?statistics={active|full}  
[&refresh=number]
```

To maximize resource availability it is recommended that each user of iSQL*Plus have a database schema profile with appropriately defined limits.

For the full syntax, and for further information about the full iSQL*Plus Server Statistics report, see "[iSQL*Plus Server Statistics](#)" on page 2-12. Only active statistics are shown in the following list:

Active Statistics

The active statistics report shows the current values for the following:

Sessions active	The number of concurrent active sessions, or the number of sessions currently logged in to iSQL*Plus.
Sessions since startup	The cumulative count of sessions established since the iSQL*Plus Server started.
Maximum concurrent sessions	The maximum or peak number of concurrent sessions since the iSQL*Plus Server started.
Sessions expired since startup	The cumulative count of sessions timed-out due to inactivity since the iSQL*Plus Server started.
Requests active	The number of concurrent active HTTP requests. Each request corresponds to a user action such as clicking a button, and the processing of that request by iSQL*Plus. Requests active has a maximum value set by <code>iSQLPlusNumberOfThreads</code> . If it reaches this limit and user response time is poor, then response time may be improved by increasing <code>iSQLPlusNumberOfThreads</code> .

Requests since startup	The cumulative count of active HTTP requests since the iSQL*Plus server was started.
Next expiry operation (minutes)	The number of minutes (rounded down) until the next expiry process.
Expiry operations since startup	The number of times the expiry process has run since the iSQL*Plus Server started.
Hash table collisions	The number of active sessions that currently have a hash table collision. Compare this with Sessions active to see if there is a current problem with collisions.
Hash table collisions since startup	The cumulative count of the sessions that have had a hash table collision since the iSQL*Plus Server started. Compare this with Sessions since startup to see if there is a problem with collisions.

Interpreting Active Statistics

The following notes provide some interpretation of the active statistics.

Increasing Number of Threads

If users have more idle time compared to active time, then a higher value of `iSQLPlusNumberOfThreads` may be needed. Each thread can handle one user request.

A request begins when a user clicks a button or follows a command link in iSQL*Plus, and finishes when all results have been returned to the user. Active time is when a user request is in progress, and a thread to process it is consumed. Idle time is when a user request has been processed, and the associated processing thread is available for use by another iSQL*Plus session.

Note that if `iSQLPlusHashTableSize` is not specified in the `isqlplus.conf`, its value will increase when `iSQLPlusNumberOfThreads` is increased.

Increasing Hash Table Size

If users typically have more idle time compared to active time, then a higher value of `iSQLPlusHashTableSize` is needed for a given value of `iSQLPlusNumberOfThreads`. Each user session consumes one entry in the hash table even if the session is idle.

Reducing Timeout Interval

If large numbers of sessions are being timed out, it is an indication that users may not be logging out cleanly, and sessions may be remaining idle. In this case, and if the *iSQL*Plus* Server load is high, you may want to consider reducing the *iSQLPlusTimeOutInterval* to more aggressively time out sessions.

Idle Timeout

The idle timeout is the time the Oracle HTTP Server waits for results from *iSQL*Plus*. The parameter value for the FastCGI timeout parameter, *-idle-timeout*, is set to 3600 seconds. This value is likely to prevent *iSQL*Plus* timing out before the web browser. It is sufficient for many long queries to return results before *iSQL*Plus* times out.

The idle timeout should not be confused with the *iSQLPlusTimeOutInterval* which manages the lifetime of the resources used by an idle user's session.

*iSQL*Plus* Tuning Notes

If the following *iSQL*Plus* errors appear frequently in your log at *ORACLE_HOME/Apache/Apache/logs/error_log*:

```
[Mon Feb 14 17:08:09 2005] [error] [client 148.87.9.44]
(146)Connection refused: FastCGI: failed to connect to server
"/oracle/sqlplus/bin/isqlplus": connect() failed
```

or if your users see the following error page generated by the Oracle HTTP Server:

Internal Server Error
The server encountered an internal error or misconfiguration and was unable to complete your request.

This indicates that *iSQL*Plus* has not been able to handle the request load. The common cause of this problem is that *iSQLPlusNumberOfThreads* is set to too small a value.

10

SQL*Plus Security

This chapter describes the available methods for controlling access to database tables and SQL*Plus commands. 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](#)
- [iSQL*Plus Security](#)

PRODUCT_USER_PROFILE Table

Various Oracle products use 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—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 via 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 the Oracle installation and user's manuals provided for your operating system or 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 that the PUP table information is not loaded.

PUP Table Structure

The PUP table has the following columns:

PRODUCT	NOT NULL CHAR (30)
USERID	CHAR(30)
ATTRIBUTE	CHAR(240)
SCOPE	CHAR(240)
NUMERIC_VALUE	NUMBER(15,2)
CHAR_VALUE	CHAR(240)
DATE_VALUE	DATE
LONG_VALUE	LONG

Description and Use of PUP Columns

The following list describes each column in the PUP table:

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 (in 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 " for a list of SQL and SQL*Plus commands you can disable. See " Creating and Controlling Roles " 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 " 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 usernames should have only SELECT access to this table, which allows 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	NUMBERIC VALUE	CHAR VALUE	DATE 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.

You can disable the following SQL*Plus commands:

COPY	HOST	SET
EDIT	PASSWORD	SPOOL
EXECUTE	QUIT	START
EXIT	RUN	
GET	SAVE	

Notes:

- Disabling HOST also disables your operating system's alias for HOST, such as \$ on VMS, and ! on UNIX
 - Disabling the SQL*Plus SET command will also disable the SQL SET CONSTRAINTS, SET ROLE and SET TRANSACTION commands.
 - Disabling the SQL*Plus START command will also disable the SQL*Plus @ and @@ commands.
-

You can also disable the following SQL commands:

ALTER	GRANT	SET CONSTRAINTS
ANALYZE	INSERT	SET ROLE
AUDIT	LOCK	SET TRANSACTION
CONNECT	NOAUDIT	TRUNCATE
CREATE	RENAME	UPDATE
DELETE	REVOKE	
DROP	SELECT	

You can also disable the following PL/SQL commands:

BEGIN	DECLARE
-------	---------

Note: Disabling BEGIN and DECLARE does not prevent the use of the SQL*Plus EXECUTE command. EXECUTE must be disabled separately.

Example 10–1 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/*your_password*

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/*your_password*;
SELECT * FROM EMP_DETAILS_VIEW;

This command causes the following error message:

 SP2-0544: invalid command: SELECT

4. To delete this row and remove the restriction from the user HR, CONNECT again with SYSDBA privileges 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 *Oracle9i SQL Reference*, your *Oracle9i Database Administrator's Guide*, and your *Oracle9i 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 via 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 allows 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 *Oracle9i SQL Reference* and *Oracle9i 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
-----	-----	-----	-----	-----	-----	-----
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. See "[Disabling SET ROLE](#)" for more information.

To re-enable roles, delete the row containing the restriction.

Disabling Commands with SQLPLUS -RESTRICT

Like the Product User Profile table, the RESTRICT option allows 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

Notes:

- Disabling HOST also disables your operating system's alias for HOST, such as \$ on VMS, 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 4-9.

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 Oracle HTTP Server.
- The Oracle Net connection between the iSQL*Plus Server (in the Oracle HTTP Server) and Oracle9*i*.

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 Oracle HTTP Server is provided by standard HTTPS, which is fully supported by Oracle. It enables secure listener connections with an Oracle-provided encryption mechanism via the Secure Sockets Layer (SSL). It can be implemented when installing the Oracle HTTP Server by installing the *mod_ssl* module. For detailed information about implementing HTTPS security in Oracle, see the *Oracle Advanced Security Administrator's Guide*.

The Oracle Net connection between the iSQL*Plus Server and Oracle9*i* provides the same security as in previous client server architectures. For more information about Oracle Net connection security, see the *Oracle9i Net Services Administrator's Guide* and the *Oracle Advanced Security Administrator's Guide*.

Administration Privileges

There are three 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 Oracle HTTP Server authentication username and password entered in a separate dialog.
- Generate the iSQL*Plus Server statistics report
 - Requires an Oracle HTTP Server authentication username and password.

Enabling Server Authentication for Users

By default, Oracle HTTP Server authentication is enabled for SYSDBA and SYSOPER privileged users. You may also want to limit who can access iSQL*Plus by enabling Oracle HTTP Server authentication for normal user logins. You can enable Oracle HTTP Server authentication for normal user connections by editing the *isqlplus.conf* file and changing the following lines:

```
<Location /isqlplus>
    SetHandler fastcgi-script
    Order deny,allow
    Allow from all
</Location>
```

to:

```
<Location /isqlplus>
    SetHandler fastcgi-script
    Order deny,allow
    AuthType Basic
    AuthName 'iSQL*Plus'
    # The following line for UNIX, comment out the Windows line.
    # AuthUserFile $ORACLE_HOME/sqlplus/admin/iplus.pw
    # The following line for Windows, comment out the UNIX line.
    AuthUserFile %ORACLE_HOME%\sqlplus\admin\iplus.pw
    Require valid-user
</Location>
```

For information about editing the *isqlplus.conf* file, see "[Session Integrity](#)" on page 3-7.

iplus.pw is suggested as the file to contain the Oracle HTTP Server authentication usernames and passwords for user connections. Now, whenever a user connection is requested, users are not only required to enter their Oracle9*i* username and password, but they are also prompted to enter an Oracle HTTP Server authentication username and password.

Enabling or Disabling 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 allows greater security for iSQL*Plus Servers in hosted environments. Connection identifiers are listed in the order defined in *iSQLPlusConnectIdList*.

You can edit the *isqlplus.conf* file to enforce restricted database access by changing the following line:

```
FastCgiServer ... -initial-env "iSQLPlusConnectIdList=SID1, SID2,..."
```

where *SID1*, *SID2*, ... is a comma separated list of Oracle Net connection identifiers specifying permitted databases. For example:

```
FastCgiServer ... -initial-env "iSQLPlusConnectIdList=ABC1, PROD2, DEV3"
```

For information about editing the *isqlplus.conf* file, see "[Session Integrity](#)" on page 3-7.

While no quotes or embedded whitespace is allowed in a connection identifier, quotes are required around the entire *iSQLPlusConnectIdList*= argument as shown. Connection identifiers are case insensitive, and each connection identifier listed in the argument should be identical to an alias in the *tnsnames.ora* file.

There are several initialization parameters that are set in one statement in the *isqlplus.conf* file. You should leave existing elements intact.

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.

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 DBA Access

SYSDBA and SYSOPER privileged connections are not available to iSQL*Plus users automatically, but must be set up the system administrator. To connect with SYSDBA or SYSOPER privileges, or to generate the iSQL*Plus Server Statistics report, your username and password must be added to the iSQL*Plus authentication file for the Oracle HTTP Server. For example, on Windows, the authentication file is installed, with no user entries, at %ORACLE_HOME%\sqlplus\admin\iplusdba.pw. The username and password used in the authentication file are independent of the Oracle9i username and password.

Warning: If the Oracle HTTP Server is started by a user who is a member of the "dba" or "oper" groups on UNIX, or who is a member of the ORA_DBA, ORA_OPER, ORA_SID_DBA, or ORA_SID_OPER groups on Windows, the iSQL*Plus DBA URL is automatically authenticated for Oracle9i by the operating system. To avoid this, start the Oracle HTTP Server as a user who is not a member of these operating system groups.

Users of the iSQL*Plus DBA URL can authenticate for Oracle9i using '/ as sysdba' or '/ as sysoper'.

Adding Entries to an Oracle HTTP Server Authentication File

If you have enabled Oracle HTTP Server authentication for user connections, you need to create a separate authentication file to contain username/password entries for user level connections. See "[Enabling Server Authentication for Users](#)" for information about enabling user level Oracle HTTP Server authentication.

To create a new entry in an Oracle HTTP Server authentication file on Windows.

1. Log in to the machine running the Oracle HTTP Server as the Oracle HTTP Server administrator.
2. Open a terminal.
3. Run the *htpasswd* utility to add users to the authentication file. *htpasswd* is usually located in %ORACLE_HOME%\Apache\Apache\bin. For SYSDBA or SYSOPER users, use the form:

```
htpasswd %ORACLE_HOME%\sqlplus\admin\iplusdba.pw username
```

For user connections, where *iplus.pw* has been created as an empty authentication file, use the form:

```
htpasswd %ORACLE_HOME%\sqlplus\admin\iplus.pw username
```

In both cases you are prompted for the associated password. For further information about *htpasswd*, see the Oracle HTTP Server documentation.

To create a new entry in an Oracle HTTP Server authentication file on UNIX.

1. Log in to the machine running the Oracle HTTP Server as the Oracle HTTP Server administrator.
2. Open a terminal.

3. Run the *htpasswd* utility to add users to the authentication file. *htpasswd* is usually located in \$ORACLE_HOME/Apache/Apache/bin. For SYSDBA or SYSOPER users, use the form:

```
htpasswd $ORACLE_HOME/sqlplus/admin/iplusdba.pw username
```

For user connections, where *iplus.pw* has been created as an empty authentication file, use the form:

```
htpasswd $ORACLE_HOME/sqlplus/admin/iplus.pw username
```

In both cases you are prompted for the associated password. For further information about *htpasswd*, see the Oracle HTTP Server documentation.

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 Oracle HTTP Server authentication username and password, you may not be required to re-authenticate to the Oracle HTTP Server until you restart your browser. However, you are still required to log in with your Oracle9i username and password.
- The Product User Profile (PUP) tables are per user, per database as for SQL*Plus client server installations. See "["PRODUCT_USER_PROFILE Table"](#)" 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. No user *login.sql* file is read.

11

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. In order to access the functionality of the commands mentioned in this chapter, database administrator privileges are necessary.

For more information on database administration, see the *Oracle9i 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 10, "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.

You cannot use STARTUP or SHUTDOWN to start or stop Oracle instances on Oracle7 servers.

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 *Oracle9i Database Concepts* guide. For information about the STARTUP command, see [Chapter 13, "SQL*Plus Command Reference"](#).

Example 11–1 Starting an Instance

To start an Oracle instance, without mounting the database, enter



```
STARTUP NOMOUNT
```

Example 11–2 Mounting the Database

To start an instance, mount the database, but leave the database closed, enter



```
STARTUP MOUNT
```

Example 11–3 Opening the Database

To start an instance using the Oracle9i Server parameter file INITSALE.ORA, mount and open the database named SALES in exclusive mode, and restrict access to administrative personnel, enter



```
STARTUP OPEN sales PFILE=INITSALE.ORA EXCLUSIVE RESTRICT
```

where SALES is the database name specified in the DB_NAME parameter in the INITSALE.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 closes all online datafiles.

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 processes that constitute an Oracle instance.

For more information about database shutdown, see the *Oracle9i Database Concepts* guide. For information about the **SHUTDOWN** command, see [Chapter 13, "SQL*Plus Command Reference"](#).

Example 11–4 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 allows 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 permits 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 *Oracle9i Database Concepts* manual. For information about using the **ARCHIVE LOG** command, see [Chapter 13, "SQL*Plus Command Reference"](#).

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 using the RECOVER command, see [Chapter 13, "SQL*Plus Command Reference"](#).

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 table-spaces, enter

RECOVER TABLESPACE ts1, ts2

Make sure that the table-spaces you are interested in recovering have been taken offline, before proceeding with recovery for those table-spaces.

12

SQL*Plus Globalization Support

This chapter provides a brief overview of the globalization support in SQL*Plus:

- [Configuring Globalization Support in Command-line SQL*Plus](#)
- [Configuring Globalization Support in iSQL*Plus](#)

For more information on globalization support, see the Oracle Technology Network globalization notes at <http://otn.oracle.com/tech/globalization/content.html>, and see the *Oracle9i Database Globalization Support Guide*

Configuring Globalization Support in Command-line SQL*Plus

To display another language in SQL*Plus, you must configure both the Oracle9*i* database and the client environment before starting SQL*Plus. Configuration of the client environment involves setting the NLS_LANG environment variable. NLS_LANG is read by SQL*Plus at startup.

SQL*Plus

To display and enter data in the Japanese character set using UTF-8 character encoding.

On UNIX, do the following:

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
```

On Windows, do the following:

1. Ensure you have exited your current SQL*Plus session.
2. Open System from the Control panel
3. Create a new environment variable, NLS_LANG, with a value of Japanese_Japan.UTF8.
4. Restart Windows.

The NLS_LANG parameter 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 *Oracle9*i* Database Globalization Support Guide*.

Oracle9*i* Database

To store data in the Japanese character set using UTF-8 character encoding.

Ensure that your Oracle9*i* database has been created with the UTF8 character set. See your Oracle9*i* Installation Guide for information about creating your database in a character set other than US7ASCII.

Configuring Globalization Support in iSQL*Plus

To display another language in *iSQL*Plus*, you must configure all three tiers. The following example is for Japanese using the Unicode (UTF-8) character set in Microsoft Windows.

To use the UTF-8 character encoding for Japanese:

Web Browser

1. Ensure you have a font available that supports the Unicode character set.

Microsoft Language Packs and updates are available for Windows operating systems to provide international language support at:

<http://windowsupdate.microsoft.com/>

or you can find information about Asian language support for Windows at:

<http://www.microsoft.com/windows/ie/features/ime.asp>

Netscape information about fonts, and font downloads to support international language sets can be found at:

<http://home.netscape.com/eng/intl/>.

2. Change the character encoding in your web browser:

For Microsoft Internet Explorer 5.0:

- a. Select Encoding from the View menu.
- b. Select Unicode (UTF-8).

For Netscape Navigator 4.7:

- a. Select Character Set from the View menu.
- b. Click Unicode (UTF-8).

3. Set the fonts associated with the UTF-8 character encoding:

For Microsoft Internet Explorer:

- a. Select Internet Options... from the Tools menu.
- b. Select the General tab in the Internet Options dialog box and click Fonts...
- c. Choose a language script and the web page (proportional) font and plain text (fixed-width) font to be used with it.

- d. You can install fonts and support for additional languages by selecting Windows Update on the Tools menu

For Netscape Navigator:

- a. Select Preferences from the Edit menu.
- b. Select Fonts under Appearance.
- c. Choose Unicode from the Encoding dropdown list.
- d. Select the variable and fixed pitch fonts that support the Unicode character set from the Variable and Fixed Pitch dropdown lists.

Oracle HTTP Server

Set the Globalization Support variables you want in the Oracle HTTP Server operating system. Every *iSQL*Plus* session inherits this environment.

On Windows, do the following:

1. Shutdown the Oracle HTTP Server.
2. Open System from the Control Panel.
3. Create a new environment variable, NLS_LANG, with a value of Japanese_Japan.UTF8.
4. Restart the Oracle HTTP Server.

On UNIX, do the following:

1. Shutdown the Oracle HTTP Server.
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`
3. Restart the Oracle HTTP Server.

The Oracle HTTP Server should be started from the terminal used to set the NLS_LANG variable. This is to ensure that the variable is read at startup. Alternatively, NLS_LANG could be set in your login initialization file or a command shell initialization file.

Oracle9*i*

Create your Oracle9*i* database with the UTF8 character set.

Part III

SQL*Plus Reference

This section contains the SQL*Plus command reference, and the list of SQL*Plus error messages.

The following chapters are covered in this section:

- [SQL*Plus Command Reference](#)
- [SQL*Plus Error Messages](#)

SQL*Plus Command Reference

This chapter contains descriptions of the SQL*Plus commands available in command-line and *i*SQL*Plus interfaces listed alphabetically. Each description contains the following parts:

Syntax	Shows how to enter the command and provides a brief description of the basic uses of the command. Refer to " Conventions in Code Examples " on page -xxiv for an explanation of the syntax notation
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.

A summary table that lists and briefly describes SQL*Plus commands precedes the individual command descriptions.

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 just 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
@	13-5	Runs the SQL*Plus statements in the specified script. The script can be called from the local file system or from a web server.
@@	13-7	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)	13-9	Executes the SQL command or PL/SQL block.
ACCEPT	13-10	Reads a line of input and stores it in a given user variable.
APPEND	13-12	Adds specified text to the end of the current line in the buffer.
ARCHIVE LOG	13-10	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	13-16	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	13-18	Specifies where and how formatting will change in a report, or lists the current break definition.
BTITLE	13-23	Places and formats a specified title at the bottom of each report page, or lists the current BTITLE definition.
CHANGE	13-24	Changes text on the current line in the buffer.
CLEAR	13-27	Resets or erases the current clause or setting for the specified option, such as BREAKS or COLUMNS.
COLUMN	13-29	Specifies display characteristics for a given column, or lists the current display characteristics for a single column or for all columns.
COMPUTE	13-40	Calculates and prints summary lines, using various standard computations, on subsets of selected rows, or lists all COMPUTE definitions.
CONNECT	13-46	Connects a given user to Oracle.
COPY	13-48	Copies results from a query to a table in a local or remote database.
DEFINE	13-49	Specifies a user variable and assigns it a CHAR value, or lists the value and variable type of a single variable or all variables.

Command	Page	Description
DEL	13-51	Deletes one or more lines of the buffer.
DESCRIBE	13-53	Lists the column definitions for the specified table, view, or synonym or the specifications for the specified function or procedure.
DISCONNECT	13-60	Commits pending changes to the database and logs the current user off Oracle, but does not exit SQL*Plus.
EDIT	13-61	Invokes a host operating system text editor on the contents of the specified file or on the contents of the buffer.
EXECUTE	13-63	Executes a single PL/SQL statement.
EXIT	13-64	Terminates SQL*Plus and returns control to the operating system.
GET	13-66	Loads a host operating system file into the buffer.
HELP	13-68	Accesses the SQL*Plus help system.
HOST	13-69	Executes a host operating system command without leaving SQL*Plus.
INPUT	13-71	Adds one or more new lines after the current line in the buffer.
LIST	13-73	Lists one or more lines of the buffer.
PASSWORD	13-75	Allows a password to be changed without echoing the password on an input device.
PAUSE	13-76	Displays the specified text, then waits for the user to press [Return].
PRINT	13-77	Displays the current value of a bind variable.
PROMPT	13-78	Sends the specified message to the user's screen.
QUIT	13-64	Terminates SQL*Plus and returns control to the operating system. QUIT is identical to EXIT.
RECOVER	13-79	Performs media recovery on one or more tablespaces, one or more datafiles, or the entire database.
REMARK	13-86	Begins a comment in a script.
REPFOOTER	13-87	Places and formats a specified report footer at the bottom of each report, or lists the current REPFOOTER definition.
REPHEADER	13-89	Places and formats a specified report header at the top of each report, or lists the current REPHEADER definition.

Command	Page	Description
RUN	13-92	Lists and runs the SQL command or PL/SQL block currently stored in the buffer.
SAVE	13-93	Saves the contents of the buffer in a host operating system file (a script).
SET	13-95	Sets a system variable to alter the SQL*Plus environment for your current session.
SHOW	13-124	Shows the value of a SQL*Plus system variable or the current SQL*Plus environment.
SHUTDOWN	13-129	Shuts down a currently running Oracle instance.
SPOOL	13-131	Stores query results in an operating system file and, optionally, sends the file to a printer.
START	13-132	Runs the SQL*Plus statements in the specified script. The script can only be called from a <i>url</i> in iSQL*Plus. It can be called from the local file system or from a web server in command-line SQL*Plus.
STARTUP	13-134	Starts an Oracle instance and optionally mounts and opens a database.
STORE	13-138	Saves attributes of the current SQL*Plus environment in a host operating system file (a script).
TIMING	13-139	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	13-141	Places and formats a specified title at the top of each report page, or lists the current TTITLE definition.
UNDEFINE	13-144	Deletes one or more user variables that you defined either explicitly (with the DEFINE command) or implicitly (with an argument to the START command).
VARIABLE	13-145	Declares a bind variable that can be referenced in PL/SQL.
WHENEVER OSERROR	13-152	Exits SQL*Plus if an operating system command generates an error. Performs the specified action if an operating system command generates an error.
WHENEVER SQLERROR	13-154	Exits SQL*Plus if a SQL command or PL/SQL block generates an error. Performs the specified action if a SQL command or PL/SQL block generates an error.

@ ("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.

Terms

Refer to the following for a description of the term or clause:

url

Specifies the Uniform Resource Locator of a script to run on the specified web server. SQL*Plus supports HTTP and FTP protocols.

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 the **SUFFIX** variable of the **SET** command on page 13-121.

When you enter `@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 Oracle installation and user's manual(s) 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 of 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, refer to the subsection "[Substitution Variables in iSQL*Plus](#)" under "[Writing Interactive Commands](#)" on page 6-24.

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

In a script, you can include any command you would normally enter interactively (typically, SQL, SQL*Plus commands, or PL/SQL blocks).

An EXIT or QUIT command used in a script terminates SQL*Plus.

The @ command functions similarly to START.

If the START command is disabled (see "[Disabling SQL*Plus, SQL, and PL/SQL Commands](#)" on page 10-4), this will also disable the @ command. See [START](#) on page 13-132 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 the SQLTERMINATOR variable of the SET command in this chapter 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 by using:



@HTTP://*machine_name.domain:port*/SCRIPTSERVER?ENDOFYEAR VAL1 VAL2

@@ (double “at” sign)

Syntax

`@@url|file_name[.ext]`

Runs a script. This command is almost identical 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 or *url* as the script from which it was called. Only the *url* form is supported in iSQL*Plus.

Terms

Refer to the following for a description of the term or clause:

url

Specifies the Uniform Resource Locator of a script to run on the specified web server. SQL*Plus supports HTTP and FTP protocols.

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 the [SUFFIX](#) variable of the [SET](#) command on page 13-121.

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 such a file, SQL*Plus searches a system-dependent path to find the file. Some operating systems may not support the path search. See the Oracle installation and user’s manual provided for your operating system for specific information related to your operating system environment.

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

You can include in a script any command you would normally enter interactively (typically, SQL or SQL*Plus commands).

An EXIT or QUIT command used in a script terminates SQL*Plus.

The @@ command functions similarly to START.

If the START command is disabled (see "[Disabling SQL*Plus, SQL, and PL/SQL Commands](#)" on page 10-4), this will also disable the @@ command. For more information, see the [SPOOL](#) command on page 13-131.

SQL*Plus removes the SQLTERMINATOR (a semicolon by default) before the @@ command is issued. A workaround for this is to add another SQLTERMINATOR. See the [SQLTERMINATOR](#) variable of the [SET](#) command on page 13-121 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 EMPPRPT 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 EMPPRPT in the current local 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 SQL command or PL/SQL block currently stored in the SQL buffer.

Usage

You can enter a slash (/) at the command prompt or at a line number prompt of a multi-line command.

The slash command functions similarly to RUN, but does not list the command in the buffer on your screen.

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 (/) at the command prompt 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

ACCEPT is not available in iSQL*Plus.

Syntax

ACC[EPT] *variable* [NUM[BER]]|CHAR|DATE] [FOR[MAT] *format*] [DEF[AULT] *default*] [
[PROMPT *text*]|NOPR[OMPT]] [HIDE]

Reads a line of input and stores it in a given user variable.

Terms

Refer to the following list for a description of each term or clause:

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 datatype of *variable* the datatype NUMBER. If the reply does not match the datatype, ACCEPT gives an error message and prompts again.

CHAR

Makes the datatype of *variable* the datatype CHAR. The maximum CHAR length limit 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.

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 for a reply. The format element must be a text constant such as A10 or 9.999. See the [CHANGE](#) command in this chapter for a complete list of format elements.

Oracle date formats such as “dd/mm/yy” are valid when the datatype is DATE. DATE without a specified format defaults to the Oracle NLS_

DATE_FORMAT of the current session. See the *Oracle9i Database Administrator's Guide* and the *Oracle9i SQL Reference* for information on Oracle date formats.

DEF[ULT]

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.

HIDE

Suppresses the display as you type the reply.

To display or reference variables, use the **DEFINE** command. See the **DEFINE** command in this chapter 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 named HIRED with the format “dd/mm/yyyy” and a default of “01/01/2001”, enter



```
ACCEPT hired DATE FORMAT 'dd/mm/yyyy' DEFAULT '01/01/2001'-
PROMPT 'Enter date hired: '
```

APPEND

APPEND is not available in iSQL*Plus.

Syntax

A[PPEND] *text*

Adds specified text to the end of the current line in the SQL buffer.

Terms

Refer to the following for a description of the term or clause:

text

Represents the text to append. 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

Refer to the following list for a description of each term or clause:

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 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 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](#) in this chapter.

If an online redo log file group fills and none are available for reuse, database operation is suspended. The condition can be resolved by archiving a log file group.

For information about specifying archive destinations, see your platform-specific Oracle documentation.

Note: This command applies only to the current instance. To specify archiving for a different instance or for all instances in a Parallel Server, use the SQL command `ALTER SYSTEM`. For more information about using SQL commands, see the *Oracle9i 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

ATTRIBUTE [*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 format for NUMBER data.

Also lists the current display characteristics for a single attribute or all attributes.

Terms

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.

Refer to the following list for a description of each term or clause:

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* will apply 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 20 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 Requires the following syntax:

{*column*|*expr*|ROW|REPORT}

action Requires the following 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
- printing computed figures each time a given column value changes or at the end of the report (see also the [COMPUTE](#) command)

Enter BREAK with no clauses to list the current BREAK definition.

Terms

Refer to the following list for a description of each term or clause:

ON *column* [*action* [*action*]]]

When you include *action*(s), specifies *action*(s) 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 *action*(s), 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 break(s), 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 occurring 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.

ON *expr* [*action* [*action*]]

When you include action(s), specifies action(s) for SQL*Plus to take when the value of the expression changes.

When you omit action(s), BREAK ON *expr* suppresses printing of duplicate values of *expr* and marks a place in the report 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 above for ON *column* also applies to ON *expr*.

ON ROW [*action* [*action*]]

When you include action(s), specifies action(s) 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.

Refer to the following list for a description of each action:

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.

[SKI[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 via 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 inserts one blank line when the value of JOB_ID changes, and *additionally* prints the sum of SALARY and inserts another blank line when the value of DEPARTMENT_ID changes, 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 SKIP 1 ON JOB_ID SKIP 1 DUPLICATES
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

BTITLE [*printspec* [*text*|*variable*] ...] [ON|OFF]

where *printspec* represents one or more of the following clauses used to place and format the *text*:

COL <i>n</i>	CE[ENTER]
S[KIP] [<i>n</i>]	R[IGHT]
TAB <i>n</i>	BOLD
LE[FT]	FORMAT <i>text</i>

Places and formats a specified title at the bottom of each report page, or lists the current BTITLE definition.

For a description of the old form of BTITLE, see [Appendix C, "Obsolete SQL*Plus Commands"](#).

Terms

Refer to the [TTITLE](#) command in this chapter for information on terms and clauses in the BTITLE command syntax.

Enter BTITLE with no clauses to list the current BTITLE definition.

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.

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.

Terms

Refer to the following list for a description of each term or clause:

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
```

will find the first occurrence of “aq”, “AQ”, “aQ”, or “Aq” and change 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 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 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.

Terms

Refer to the following list for a description of each term or clause:

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 the [SET BUFFER](#) command in [Appendix C, "Obsolete SQL*Plus Commands"](#)).

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 the **SET BUFFER** command in [Appendix C, "Obsolete SQL*Plus Commands"](#)).

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]|C[ENTRE]|RIGHT}
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_WWRAPPED]|TRU[NATED]

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.

Terms

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.

Refer to the following list for a description of each term or clause:

{*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.

ALI[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}

Allows entity mapping to be turned on or off for selected columns in HTML output. This feature allows 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 4-4 and [SET](#) later this Chapter.

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_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.

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.

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.

To change the width of a datatype to *n*, use FORMAT An. (A stands for alphanumeric.) 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 parameters in effect. Otherwise, the default width is A9. In Oracle9*i*, the NLS parameters may be set in your database parameter file or may be environment variables or an equivalent platform-specific mechanism. They may also be specified for each session with the ALTER SESSION command. (See the docu-

mentation for Oracle9*i* for a complete description of the NLS parameters).

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 automatically allows for a very wide column.

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 To change a NUMBER column's width, use FORMAT followed by an element as specified in [Table 13–1](#).

Table 13–1 Number Formats

Element	Examples	Description
9	9999	Number of "9"s specifies number of significant digits returned. Blanks are displayed for leading zeroes. A zero (0) is displayed for a value of zero.
0	0999 9990	Displays a leading zero or a value of zero in this position as 0.
\$	\$9999	Prefixes value with dollar sign.
B	B9999	Displays a zero value as blank, regardless of "0"s in the format model.
MI	9999MI	Displays "-" after a negative value. For a positive value, a trailing space is displayed.
S	S9999	Returns "+" for positive values and "-" for negative values in this position.
PR	9999PR	Displays a negative value in <angle brackets>. For a positive value, a leading and trailing space is displayed.
D	99D99	Displays the decimal character in this position, separating the integral and fractional parts of a number.
G	9G999	Displays the group separator in this position.
C	C999	Displays the ISO currency symbol in this position.

Table 13–1 Number Formats

Element	Examples	Description
L	L999	Displays the local currency symbol in this position.
, (comma)	9,999	Displays a comma in this position.
. (period)	99.99	Displays a period (decimal point) in this position, separating the integral and fractional parts of a number.
V	999V99	Multiplies value by 10^n , where n is number of "9"s after "V".
EEEE	9.999EEEE	Displays value in scientific notation (format must contain exactly four "E"s).
RN or rn	RN	Displays upper- or lowercase Roman numerals. Value can be an integer between 1 and 3999.
DATE	DATE	Displays value as a date in MM/DD/YY format; used to format NUMBER columns that represent Julian dates.

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 FORMAT, 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 within the column width, SQL*Plus indicates overflow by displaying a pound sign (#) in place of each digit the width allows.

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 the **HEADSEP** variable of the **SET** command in this chapter for information on changing the HEADSEP character.

JUS[TIFY] {L[EFT]|C[ENTER]|C[ENTRE]|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.

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 val-

ues 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.

For information on displaying a column value in the bottom title, see [COLUMN OLD_VALUE](#). For more information on referencing variables in titles, see the [TTITLE](#) command later in this chapter. For information on formatting and valid format models, see [COLUMN FORMAT](#) command.

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 will always become CHAR so the SET NULL text can be stored in it.

OLD_VALUE *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.

For information on displaying a column value in the top title, see [COLUMN NEW_VALUE](#). For more information on referencing variables in titles, see the [TTITLE](#) command later in this chapter.

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_WWRAPPED]|TRU[NCTATED]

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.

Usage

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. Thus, the COLUMN commands you enter can control a column's display attributes for multiple SQL SELECT commands.

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 shipped by air freight 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

In order 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 in this case instead of EMP_DETAILS_VIEW as you have used up to now. (For details on creating a date variable, see ["Displaying the Current Date in Titles"](#) under ["Defining Page and Report Titles and Dimensions"](#) on page 7-30.)



```
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;
```

Your two page report would look similar to the following report, with “Job Report” centered within your current linesize:



Job Report

04/19/01

Job: MK_MAN

LAST NAME	MANAGER_ID	HIRE_DATE	SALARY	DEPARTMENT_ID
Hartstein	100	17-FEB-96	\$13,000.00	20
			\$13,000.00	

Job Report

04/19/01

Job: SA_MAN

LAST NAME	MANAGER_ID	HIRE_DATE	SALARY	DEPARTMENT_ID
Errazuriz	100	10-MAR-97	\$12,000.00	80
Zlotkey	100	29-JAN-00	\$10,500.00	80
Cambrault	100	15-OCT-99	\$11,000.00	80
Russell	100	01-OCT-96	\$14,000.00	80
Partners	100	05-JAN-97	\$13,500.00	80

Job Report

04/19/01

Job: SA_MAN

LAST NAME	MANAGER_ID	HIRE_DATE	SALARY	DEPARTMENT_ID
			\$12,200.00	

6 rows selected.

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 *Oracle9i SQL Reference* for information on the ALTER SESSION command.

Note that in a SELECT statement, some SQL calculations or functions, such as TO_CHAR, may cause a column to be very wide. In such cases, use the FORMAT option to alter the column width.

COMPUTE

Syntax

```
COMP[UTE] [function [LAB[EL] text] ...
          OF {expr|column|alias} ...
          ON {expr|column|alias|REPORT|ROW} ...]
```

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 7-12.

Terms

Refer to the following list for a description of each term or clause:

function ...

Represents one of the functions listed in [Table 13–2](#). 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 13–2 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

Table 13–2 COMPUTE Functions

Function	Computes	Applies to Datatypes
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 line-size, 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*} ...

Specifies the event SQL*Plus will use as a break. (*column* cannot have a table or view appended to it. To achieve this, you can alias the column in the SQL statement.) COMPUTE prints the computed value and restarts the computation when the event occurs (that is, when the value

of the expression changes, a new ROW is fetched, or the end of the report is reached).

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
            Cambrault         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;

```

COMPUTE



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}]

where *logon* requires the following syntax:

username/*password*[@*connect_identifier*]

Connects a given username to Oracle. In iSQL*Plus you must always include your username and password in a CONNECT command as iSQL*Plus does not prompt for a missing password. CONNECT does not reprompt for username or password if the initial connection does not succeed.

Terms

Refer to the following list for a description of each term or clause:

username/*password*

The username and password with which you wish to connect to Oracle. If you omit *username* and *password*, SQL*Plus prompts you for them. If you enter a slash (/) or simply enter Return to the prompt for *username*, SQL*Plus logs you in using a default logon (see “/ (slash)”).

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 for information about changing your password in SQL*Plus, and see “[Changing your Password](#)” on page 4-18 for information about changing passwords in iSQL*Plus.

connect_identifier

An Oracle Net connect identifier. The exact syntax depends on the Oracle Net communications protocol your Oracle installation uses. For more information, refer to the Oracle Net manual for your protocol 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

Oracle9i Database Administrator's Guide for information about operating system authentication.

AS {SYSOPER|SYSDBA}

The AS clause allows 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 *Oracle9i Database Administrator's Guide*.

Usage

CONNECT commits the current transaction to the database, disconnects the current username from Oracle, 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 *Oracle9i SQL Reference*.

Examples

To connect across Oracle Net with username HR and password HR to the database known by the Oracle Net alias as FLEETDB, enter



```
CONNECT HR/your_password@FLEETDB
```

To connect as user HR, letting SQL*Plus prompt you for the password, enter



```
CONNECT HR
```

For more information about setting up your password file, refer to the *Oracle9i Database Administrator's Guide*.

To use a password file to connect to an instance on the current node as a privileged user named HR with the password HR, enter



```
CONNECT HR/your_password 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 Oracle8. 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 variable and assigns a CHAR value to it, or lists the value and variable type of a single variable or all variables.

Terms

Refer to the following list for a description of each term or clause:

variable

Represents the user 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 user 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 user variables.

Usage

Defined variables retain their values until one of the following events occurs:

- you enter a new DEFINE command referencing the variable
- you enter an UNDEFINE command referencing the variable
- you enter an ACCEPT command referencing the variable
- you reference the variable in the NEW_VALUE or OLD_VALUE clause of the COLUMN command and reference the column in a subsequent SQL SELECT command
- you 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*.

Note that you can use DEFINE to define the variable, _EDITOR, which establishes the host system editor invoked by the SQL*Plus EDIT command.

If you continue the value of a defined variable on multiple lines (using the SQL*Plus command continuation character), SQL*Plus replaces each continuation character and carriage return you enter with a space in the resulting variable. 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 that contains a reference to &POS, SQL*Plus will substitute 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.

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.

Terms

Refer to the following list for a description of each term or clause:

<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.
<i>*</i>	Deletes the current line.
<i>* n</i>	Deletes the current line through line <i>n</i> .
<i>* LAST</i>	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 *Oracle9i 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[RE] {[schema.]object[@connect_identifier]}
```

Lists the column definitions for the specified table, view, or synonym, or the specifications for the specified function or procedure.

Terms

Refer to the following list for a description of each term or clause:

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.

@connect_identifier

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 *Oracle9i 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 allows 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 later in this chapter.

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 later in this chapter.

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

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

 PROCEDURE 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

DESCRIBE



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
```



Name	Null?	Type
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`

Name	Null?	Type
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) );
/
```

DESCRIBE

```
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
```



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)

For more information on using the CREATE TYPE command, see your *Oracle9i SQL Reference*.

For information about using the SET DESCRIBE and SHOW DESCRIBE commands, see the [SET](#) and [SHOW](#) commands later in this chapter.

DISCONNECT

Syntax

DISC[ONNECT]

Commits pending changes to the database and logs the current username out of Oracle, 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 but have the user remain in SQL*Plus. Use Logout in iSQL*Plus, and EXIT or QUIT in SQL*Plus command-line to log out of Oracle and return control to your host computer's operating system.

Examples

Your script might begin with a CONNECT command and end with a DISCONNECT, as shown below.



```
CONNECT HR/your_password
SELECT LAST_NAME, DEPARTMENT_NAME FROM EMP_DETAILS_VIEW;
DISCONNECT
SET INSTANCE FIN2
CONNECT HR2/your_password
```

EDIT

EDIT is not available in iSQL*Plus.

Syntax

ED[IT] [*file_name*[.*ext*]]

Invokes a host operating system text editor on the contents of the specified file or on the contents of the buffer.

Terms

Refer to the following for a description of the term or clause:

file_name[.*ext*]

Represents the file you wish to edit (typically a script).

Enter EDIT with no filename to edit the contents of the SQL buffer with the host 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 in this chapter.

If you specify a filename, SQL*Plus searches for the file in the current working directory. If SQL*Plus cannot find the file in the current working directory, it creates a file with the specified name.

The user variable, _EDITOR, contains the name of the text editor invoked by EDIT. You can change the text editor by changing the value of _EDITOR. See [COPY](#) for information about changing the value of a user variable. If _EDITOR is undefined, EDIT attempts to invoke the default host operating system editor.

EDIT alone places the contents of the SQL buffer in a file by default named AFIEDT.BUF (in your current working directory) and invokes 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 in this chapter.

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.

Examples

To edit the file REPORT with the extension SQL using your host operating system text editor, enter



EDIT REPORT

EXECUTE

Syntax

EXEC[UTE] *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 *PL/SQL User's Guide and Reference*.

Terms

Refer to the following for a description of the term or clause:

statement

Represents a PL/SQL statement.

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.

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 in this chapter.

EXIT

Syntax

{EXIT|QUIT} [SUCCESS|FAILURE|WARNING|*n*|*variable*|*BindVariable*] [COMMIT|ROLLBACK]

Commits or rolls back all pending changes, logs out of Oracle, 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 log out of Oracle.

Terms

Refer to the following list for a description of each term or clause:

{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 allows you to specify an operating system return code. This allows 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. See the Oracle installation and user's manual(s) provided for your operating system for details.

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](#) and [WHENEVER OSERROR](#) commands later in this chapter.

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]* [LIS[T]|NOL[IST]]

Loads a host operating system file into the SQL buffer.

Terms

Refer to the following list for a description of each term or clause:

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).

LIS[T]

Lists the contents of the file after it is loaded. This is the default.

NOL[IST]

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 the **SUFFIX** variable of the **SET** command in this chapter.

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 the [SAVE](#) command in this chapter for more information.

Examples

To load a file called YEARENDRPT with the extension SQL into the buffer, enter



```
GET YEARENDRPT
```

HELP

Syntax

HELP [*topic*]

Accesses the SQL*Plus command-line help system. Enter HELP INDEX for a list of topics.

Terms

Refer to the following for a description of the term or clause:

topic

Represents a SQL*Plus help topic, for example, COLUMN.

Enter HELP 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

Alternatively, to see a single column display of SQL*Plus commands for which help is available, enter



HELP TOPICS

HOST

HOST is not available in *i*SQL*Plus.

Syntax

HO[ST] [*command*]

Executes a host operating system command without leaving SQL*Plus.

Terms

Refer to the following for a description of the term or clause:

command

Represents a host operating system command.

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 Oracle installation and user's manual(s) provided for your operating system.

Note: Operating system commands entered from a SQL*Plus session using the HOST command do not effect the current SQL*Plus session. For example, setting an operating system environment variable does not effect the current SQL*Plus session, it only effects SQL*Plus sessions started subsequently.

You can suppress access to the HOST command. For more information about suppressing the HOST command see [Chapter 10, "SQL*Plus Security"](#).

Usage

With some operating systems, you can use a "\$" (VMS), "!" (UNIX), or another character instead of HOST. See the Oracle installation and user's manual(s) provided for your operating system for details.

You may not have access to the HOST command, depending on your operating system. See the Oracle installation and user's manual(s) provided for your operating system or ask your DBA for more information.

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 the **SQLTERMINATOR** variable of the **SET** command in this chapter for more information on the SQLTERMINATOR.

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*]

Adds one or more new lines of text after the current line in the buffer.

Terms

Refer to the following for a description of the term or clause:

text

Represents the text you wish to add. 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



```
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.

Terms

Refer to the following list for a description of each term or clause:

<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 to list all lines. The last line or only line listed becomes the new current line (marked by an asterisk).

Examples

To list the contents of the buffer, enter



LIST

You will see a listing of all lines in the buffer, similar to the following example:



```
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 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

PASSWORD is not available in iSQL*Plus. In iSQL*Plus use the Password screen.

Syntax

PASSW[ORD] [*username*]

Allows you to change a password without echoing it on an input device.

Terms

Refer to the following for a description of the clause or term:

username

Specifies the user. If omitted, *username* defaults to the current user.

Usage

To change the password of another user, you must have been granted the appropriate privilege. For more information about changing your password, see the [CONNECT](#) command in this chapter.

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

PAUSE is not available in iSQL*Plus.

Syntax

PAU[SE] [*text*]

Displays the specified text then waits for the user to press RETURN.

Terms

Refer to the following for a description of the clause or term:

text

Represents the text you wish to display.

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.

For information on pausing between pages of a report, see the **PAUSE** variable of the **SET** command later in this chapter.

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

PRI[NT] [*variable* ...]

Displays the current values of bind variables. For more information on bind variables, see your *PL/SQL User's Guide and Reference*.

Terms

Refer to the following for a description of the clause or term:

variable ...

Represents names of bind variables whose values you wish to display.

Enter PRINT with no variables to print all bind variables.

Usage

Bind variables are created using the VARIABLE command. For more information and examples, see the [VARIABLE](#) command in this chapter.

You can control the formatting of the PRINT output just as you would query output. For more information, see the formatting techniques described in [Chapter 7, "Formatting SQL*Plus Reports"](#).

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. For more information, see the [SET](#) command in this chapter.

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*]

Sends the specified message or a blank line to the user's screen.

Terms

Refer to the following for a description of the term or clause:

text

Represents the text of the message you wish to display. 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. ASKFORDEPT contains the following SQL*Plus and SQL commands:



```
PROMPT
PROMPT Please enter a valid department
PROMPT For example: 10, 20, 30, 40
SELECT DEPARTMENT_NAME FROM EMP_DETAILS_VIEW
WHERE DEPARTMENT_ID = &NEWDEPT
```



Assume you run the file using START or @:

```
@YEAREND.SQL VAL1 VAL2.SQL VAL1 VAL2x
```



```
Please enter a valid department
For example: 10, 20, 30, 40
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| 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 } [TEST | ALLOW integer CORRUPTION ]...]
|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 datafilename [, datafilename]...
/ STANDBY
{TABLESPACE tablespace [, tablespace]... | DATAFILE datafilename [, datafilename]...}
UNTIL [CONSISTENT] [WITH] CONTROLFILE }
```

where the *managed* clause has the following syntax:

```
MANAGED STANDBY DATABASE
[ {NODELAY | [TIMEOUT] integer| CANCEL [IMMEDIATE] [NOWAIT]}
| [DISCONNECT [FROM SESSION] ] [FINISH [NOWAIT]] ]
```

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 *Oracle9i Database Administrator's Guide*, the ALTER DATABASE RECOVER command in the *Oracle9i SQL Reference*, the *Oracle9i Backup and Recovery Concepts*, *Oracle9i Backup and Recovery Concepts* guide, and the *Oracle9i User-Managed Backup and Recovery Guide*.

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

You must set AUTORECOVERY ON to use the RECOVER command in iSQL*Plus. Attempting to RECOVER a database with AUTORECOVERY OFF raises the error:

```
SP2-0872 SET AUTORECOVERY ON must be used in iSQL*Plus
```

Terms

Refer to the following list for a description of each term and clause:

AUTOMATIC

Automatically generates the name of the next archived redo log file needed to continue the recovery operation. Oracle 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 then accept the generated filename or replace it with a fully qualified filename. If you know the archived filename differs from what Oracle would generate, you can save time by using the LOGFILE clause.

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 following the conventions of your operating system. 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.

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 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.

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 if no other logfile is specified. This is equivalent to specifying AUTOMATIC, except that Oracle 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.

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 *Oracle9i User-Managed Backup and Recovery Guide*.

NODELAY

Applies a delayed archivelog 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 archivelog is delayed according to the parameter setting. If DELAY was not specified in the parameter, the archivelog is applied immediately.

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 recov-

ery 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, the database remains in sustained standby recovery mode until you reissue the statement with the RECOVER CANCEL clause or until instance shutdown or failure.

CANCEL (managed clause)

In managed recovery, CANCEL terminates the managed standby recovery operation after applying the current archived redo file. Session control returns when the recovery process terminates.

CANCEL IMMEDIATE

Terminates the managed recovery operation 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 cannot be issued from the same session that issued the RECOVER MANAGED STANDBY DATABASE statement.

CANCEL NOWAIT

Terminates the managed recovery operation after the next redo log file read and returns session control immediately.

DISCONNECT FROM SESSION

Indicates that the managed redo process (MRP) should apply archived redo files as a detached background process. Doing so leaves the current session available.

FINISH

Recovers the current log standby logfiles of the standby database. It is useful in the event of the primary database failure. This clause overrides any delays specified for archivelogs, so that Oracle logs are applied immediately.

NOWAIT

Returns control immediately rather than after completion of the recovery process.

Usage

You must have the OSDBA role enabled. You cannot use the RECOVER command when connected via 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 and 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 datafile(s) 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, -- ..., refer to ["Placing Comments in Scripts" on page 6-10](#).

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]
RIGHT]
BOLD
FORMAT text
```

Places and formats a specified report footer at the bottom of each report, or lists the current REPFOOTER definition.

Terms

Refer to the [REPIHEADER](#) command for additional information on terms and clauses in the REPFOOTER command syntax.

Enter REPFOOTER with no clauses to list the current REPFOOTER definition.

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

```
REPH[EADER] [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.

Terms

Refer to the following list for a description of each term or clause. 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 user 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 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 format *variable* with the FORMAT clause.

OFF	Turns the report header or footer off (suppresses its display) without affecting its definition.
COL <i>n</i>	Indents to column <i>n</i> of the current line (backward if column <i>n</i> has been passed). Column in this context means print position, not table column.
S[KIP] [<i>n</i>]	Skips to the start of a new line <i>n</i> times; if you omit <i>n</i> , one time; if you enter zero for <i>n</i> , backward to the start of the current line.
TAB <i>n</i>	Skips forward <i>n</i> columns (backward if you enter a negative value for <i>n</i>). 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 <i>printspec</i> 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 <i>text</i>	<p>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 <i>text</i> constant such as A10 or \$999. See COLUMN FORMAT for more information on formatting and valid format models.</p> <p>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.</p> <p>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.</p>

Refer to the **FORMAT** clause of the **COLUMN** command in this chapter for more information on default formats.

Enter REPHEADER with no clauses to list the current REPHEADER definition.

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

Page: 2

LAST_NAME	SALARY
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.

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 a host operating system script.

Terms

Refer to the following list for a description of each term or clause:

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). For information on changing this default extension, see the [SUFFIX](#) variable of the [SET](#) command in this chapter.

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:

- display width for data
- customize HTML formatting
- enabling or disabling the printing of column headings
- the number of lines per page

You can also use the System Variables screen in iSQL*Plus to set system variables.

Syntax

`SET system_variable value`

where *system_variable* and *value* are shown in the [SET System Variable Summary](#) following.

Usage

SQL*Plus maintains system variables (also called SET command variables) to enable you to setup 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 *Oracle9i 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 OFF <i>tex</i> }	13-99	Sets automatic registering of scripts through the DBMS_APPLICATION_INFO package.
SET ARRAYSIZE {15 <i>n</i> }	13-100	Sets the number of rows, called a <i>batch</i> , that SQL*Plus will fetch from the database at one time.
SET AUTOCOMMIT{ON OFF IMMEDIATE <i>n</i> }	13-101	Controls when Oracle commits pending changes to the database.
SET AUTOPRINT {ON OFF}	13-101	Sets the automatic printing of bind variables.

System Variable	Page	Description
SET AUTORECOVERY [ON OFF]	13-101	ON sets the RECOVER command to automatically apply the default filenames of archived redo log files needed during recovery.
SET AUTOTRACE {ON OFF TRACE[ONLY]} [EXPLAIN] [STATISTICS]	13-102	Displays a report on the execution of successful SQL DML statements (SELECT, INSERT, UPDATE or DELETE).
SET BLOCKTERMINATOR {. c}	13-102	Sets the non-alphanumeric character used to end PL/SQL blocks to <i>c</i> .
SET CMDSEP {.: c ON OFF}	13-103	Sets the non-alphanumeric character used to separate multiple SQL*Plus commands entered on one line to <i>c</i> .
SET COLSEP {_ text{}}	13-104	In iSQL*Plus, 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 COMPATIBILITY{V7 V8 NATIVE}	13-104	Specifies the version of Oracle to which you are currently connected.
SET CONCAT {. c ON OFF}	13-105	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 {0 n}	13-105	Controls the number of batches after which the COPY command commits changes to the database.
SET COPYTYPECHECK {ON OFF}	13-105	Sets the suppression of the comparison of datatypes while inserting or appending to tables with the COPY command.
SET DEFINE {& c ON OFF}	13-105	Sets the character used to prefix substitution variables to <i>c</i> .
SET DESCRIBE [DEPTH {1 n ALL}][LINENUM {ON OFF}][INDENT {ON OFF}]	13-106	Sets the depth of the level to which you can recursively describe an object.
SET ECHO {ON OFF}	13-107	Controls whether the START command lists each command in a script as the command is executed.
*SET EDITFILE <i>file_name .ext </i>	13-107	Sets the default filename for the EDIT command.
SET EMBEDDED {ON OFF}	13-107	Controls where on a page each report begins.
SET ESCAPE {\ c ON OFF}	13-108	Defines the character you enter as the escape character.
SET FEEDBACK {6 n ON OFF}	13-108	Displays the number of records returned by a query when a query selects at least <i>n</i> records.

System Variable	Page	Description
SET FLAGGER {OFF ENTRY INTERMEDIATE FULL}	13-108	Checks to make sure that SQL statements conform to the ANSI/ISO SQL92 standard.
*SET FLUSH {ON OFF}	13-109	Controls when output is sent to the user's display device.
SET HEADING {ON OFF}	13-109	Controls printing of column headings in reports.
SET HEADSEP { c ON OFF}	13-110	Defines the character you enter as the heading separator character.
SET INSTANCE [<i>instance_path</i> LOCAL]	13-110	Changes the default instance for your session to the specified instance path.
SET LINESIZE {80 <i>n</i> }	13-111	Sets the total number of characters that SQL*Plus displays on one line before beginning a new line.
SET LOBOFFSET { <i>n</i> 1}	13-111	Sets the starting position from which CLOB and NCLOB data is retrieved and displayed.
SET LOGSOURCE [<i>pathname</i>]	13-111	Specifies the location from which archive logs are retrieved during recovery.
SET LONG {80 <i>n</i> }	13-112	Sets maximum width (in bytes) for displaying LONG, CLOB, NCLOB and XMLType values; and for copying LONG values.
SET LONGCHUNKSIZE {80 <i>n</i> }	13-112	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}]	13-112	Outputs HTML marked up text, which is the output used by iSQL*Plus.
*SET NEWPAGE {1 <i>n</i> NONE}	13-114	Sets the number of blank lines to be printed from the top of each page to the top title.
SET NULL <i>text</i>	13-114	Sets the text that represents a null value in the result of a SQL SELECT command.
SET NUMFORMAT <i>format</i>	13-114	Sets the default format for displaying numbers.
SET NUMWIDTH {10 <i>n</i> }	13-114	Sets the default width for displaying numbers.
SET PAGESIZE {24 <i>n</i> }	13-115	Sets the number of lines in each page.
*SET PAUSE {ON OFF <i>text</i> }	13-115	Allows you to control scrolling of your terminal when running reports.
SET RECSEP {WRAPPED EACH OFF}	13-115	RECSEP tells SQL*Plus where to make the record separation.

System Variable	Page	Description
SET RECSEPCHAR {_ c}	13-115	Display or print record separators.
SET SERVEROUTPUT {ON OFF} [SIZE <i>n</i>] [FORMAT {WRAPPED WORD_ WRAPPED TRUNCATED}]	13-115	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}	13-117	Allows correct alignment for terminals that display shift characters.
*SET SHOWMODE {ON OFF}	13-118	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}	13-118	Controls whether SQL*Plus allows blank lines within a SQL command or script.
SET SQLCASE {MIXED LOWER UPPER}	13-119	Converts the case of SQL commands and PL/SQL blocks just prior to execution.
*SET SQLCONTINUE {> text}	13-119	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}	13-120	Sets the prompt for the second and subsequent lines of a SQL command or PL/SQL block.
SET SQLPLUSCOMPATIBILITY {x.y[.z]}	13-120	Sets the behavior or output format of VARIABLE to that of the release or version specified by x.y[.z].
*SET SQLPREFIX {# c}	13-120	Sets the SQL*Plus prefix character.
*SET SQLPROMPT {SQL> text}	13-120	Sets the SQL*Plus command prompt.
SET SQLTERMINATOR {; c ON OFF}	13-121	Sets the character used to end and execute SQL commands to <i>c</i> .
*SET SUFFIX {SQL text}	13-121	Sets the default file extension that SQL*Plus uses in commands that refer to scripts.
*SET TAB {ON OFF}	13-122	Determines how SQL*Plus formats white space in terminal output.
*SET TERMOUT {ON OFF}	13-122	Controls the display of output generated by commands executed from a script.
*SET TIME {ON OFF}	13-122	Controls the display of the current time.
SET TIMING {ON OFF}	13-122	Controls the display of timing statistics.
*SET TRIMOUT {ON OFF}	13-122	Determines whether SQL*Plus allows trailing blanks at the end of each displayed line.

System Variable	Page	Description
*SET TRIMSPPOOL {ON OFF}	13-123	Determines whether SQL*Plus allows trailing blanks at the end of each spooled line.
SET UNDERLINE {- c ON OFF}	13-123	Sets the character used to underline column headings in SQL*Plus reports to <i>c</i> .
SET VERIFY {ON OFF}	13-123	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 {ON OFF}	13-123	Controls whether SQL*Plus truncates the display of a SELECTed row if it is too long for the current line width.

*SET command not available in *i*SQL*Plus.

SET APP[INFO]{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.

Note: To use this feature, you must have access to the DBMS_APPLICATION_INFO package. Run DBMSUTIL.SQL (this name may vary depending on your operating system) as SYS to create the DBMS_APPLICATION_INFO package. DBMSUTIL.SQL is part of the Oracle*9i* database server product.

For more information on the DBMS_APPLICATION_INFO package, see the *Oracle9i Database Performance Tuning Guide and Reference* manual.

Example

To display the setting 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—called a *batch*—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|IMMEDIATE}|*n*

Controls when Oracle commits pending changes to the database. ON commits pending changes to the database after Oracle executes each successful INSERT, UPDATE, or DELETE command 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 the ON option. *n* commits pending changes to the database after Oracle 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.

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). For more information about displaying bind variables, see the [PRINT](#) command in this chapter.

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 when AUTORECOVERY is set to ON, provided the necessary files are in the expected locations with the expected names. The filenames used when AUTORECOVERY is ON are derived from the values of the initialization parameters LOG_ARCHIVE_DEST and LOG_ARCHIVE_FORMAT.

You must set AUTORECOVERY ON to use the RECOVER command in iSQL*Plus. Attempting to RECOVER a database with AUTORECOVERY OFF raises the error:

SP2-0872 SET AUTORECOVERY ON must be used in iSQL*Plus

OFF, the default option, requires that you enter the filenames manually or accept the suggested default filename given. See the [RECOVER](#) command in this chapter for more information about database recovery.

Example

To set the recovery mode to AUTOMATIC, enter



```
SET AUTORECOVERY ON  
RECOVER DATABASE
```

SET AUTOT[RACE] {ON|OFF|TRACE[ONLY]} [EXP[LAIN]] [STATISTICS]

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 *Oracle9i SQL Reference* manual.

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 *Oracle9i Database Performance Tuning Guide and Reference* manual.

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.

AUTOTRACE is not available when FIPS flagging is enabled.

See "[Tracing Statements](#)" on page 9-2 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|*}

In iSQL*Plus, SET COLSEP determines the column separator character to be printed between column output that is rendered inside <PRE> tags. HTML table output is the default. To generate preformatted output you must set PREFORMAT ON with the SET MARKUP HTML PREFORMAT ON command.

Sets the text to be printed between selected columns. 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](#) in this chapter for more information.

Example

To set the column separator to “ | ” enter



```
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 COMPATIBILITY{V7|V8|NATIVE}

Specifies the version of Oracle SQL syntax to use. Set COMPATIBILITY to V7 for Oracle7, or to V8 for Oracle8 or later. COMPATIBILITY always defaults to NATIVE. COMPATIBILITY should be correctly set for the version of Oracle SQL syntax you want to use on the database to which you are connected, otherwise, you may be unable to run any SQL commands.

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 Oracle9*i*:



```
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 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 batches 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. For more information on the SCAN variable, see the [SET SCAN](#) command on page C-6.

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.

For more information about describing objects, see [DESCRIBE](#) earlier in this chapter.

Example

To describe the view EMP_DETAILS_VIEW to a depth of two levels, and indent the output while also displaying line numbers, first describe the view as follows:



```
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 format EMP_DETAILS_VIEW so that the output displays with indentation and line numbers, use the SET DESCRIBE command as follows:



```
SET DESCRIBE DEPTH 2 LINENUM ON INDENT ON
```

To display the above settings, enter



```
DESCRIBE EMP_DETAILS_VIEW
```



	Name	Null?	Type
1	EMPLOYEE_ID	NOT NULL	NUMBER(6)
2	JOB_ID	NOT NULL	VARCHAR2(10)
3	MANAGER_ID		NUMBER(6)
4	DEPARTMENT_ID		NUMBER(4)
5	LOCATION_ID		NUMBER(4)
6	COUNTRY_ID		CHAR(2)
7	FIRST_NAME		VARCHAR2(20)
8	LAST_NAME	NOT NULL	VARCHAR2(25)
9	SALARY		NUMBER(8,2)
10	COMMISSION_PCT		NUMBER(2,2)
11	DEPARTMENT_NAME	NOT NULL	VARCHAR2(30)
12	JOB_TITLE	NOT NULL	VARCHAR2(35)
13	CITY	NOT NULL	VARCHAR2(30)
14	STATE_PROVINCE		VARCHAR2(25)
15	COUNTRY_NAME		VARCHAR2(40)
16	REGION_NAME		VARCHAR2(25)

SET ECHO {ON|OFF}

Controls whether the START command lists each command in a script as the command is executed. ON lists the commands; OFF suppresses the listing.

SET EDITF[ILE] *file_name [.ext]*

SET EDITFILE is not supported in iSQL*Plus

Sets the default filename for the EDIT command. For more information about the EDIT command, see [EDIT](#) in this chapter.

You can include a path and/or file extension. For information on changing the default extension, see the [SUFFIX](#) variable of the SET command. 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 allows 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 FLAGGER {OFF|ENTRY |INTERMED|ATE|FULL}

Checks to make sure that SQL statements conform to the ANSI/ISO SQL92 standard. If any non-standard constructs are found, the Oracle 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 *i*SQL*Plus

Controls when output is sent to the user's display device. OFF allows the host operating system to buffer output. ON disables buffering.

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 will not affect the column width displayed, and 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] {||c|ON|OFF}

Defines the character used as the heading separator character. 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 “|”.

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. See your operating system-specific Oracle documentation for a description of how to set the initial default instance.

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 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*}

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. Refer to the Oracle installation and user's manual(s) provided for your operating system.

SET LOBOF[FSET] {*n*|1}

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 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/oracle90/dbs/arch" enter



```
SET LOGSOURCE "/usr/oracle90/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. The maximum value of *n* is 2 gigabytes.

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.

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.

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 HMTL output to it. SET MARKUP has the same options and behavior as SQLPLUS -MARKUP.

For detailed information see "["MARKUP Options"](#) on page 4-4. For examples of usage, see [SET MARKUP](#) on page 13-112, and "["Generating HTML Reports from SQL*Plus"](#) on page 8-1.

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: fffffc6} --></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}

SET NEWPAGE is not supported in iSQL*Plus

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 that represents a null value 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.

SET NUMF[ORMAT] *format*

Sets the default format for displaying numbers. Enter a number format for *format*. For number format descriptions, see the **FORMAT** clause of the **COLUMN** command in this chapter.

SET NUM[WIDTH] {10|*n*}

Sets the default width for displaying numbers. For number format descriptions, see the **FORMAT** clause of the **COLUMN** command in this chapter.

SET PAGES[IZE] {24|*n*}

Sets the number of lines in each page. You can set PAGESIZE to zero to suppress all headings, page breaks, titles, the initial blank line, and other formatting information.

SET PAU[SE] {ON|OFF|*text*}

SET PAUSE is not supported in iSQL*Plus

Allows you to control scrolling of your terminal when running reports. ON causes SQL*Plus to pause at the beginning of each page of report output. You must press [Return] after each pause. The *text* you enter specifies the text to be displayed each time SQL*Plus pauses. If you enter multiple words, you must enclose *text* 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.

SET RECSEP {WRAPPED|EA[CH]|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.

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*] [FOR[MAT] {WRA[PPED]|WORD|WRAPPED}|TRU[NATED])]

Controls whether to display output (that is, DBMS_OUTPUT.PUT_LINE) of stored procedures or PL/SQL blocks in SQL*Plus. OFF suppresses the output of DBMS_OUTPUT.PUT_LINE; ON displays the output.

SIZE sets the number of bytes of the output that can be buffered within the Oracle8i or Oracle9i database server. The default for *n* is 2000. *n* cannot be less than 2000 or greater than 1,000,000.

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 each FORMAT, every server output line begins on a new output line.

For more information on DBMS_OUTPUT.PUT_LINE, see your *Oracle9i 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 TRIGGER SERVER_TRIG BEFORE INSERT OR UPDATE -
OR DELETE
ON SERVER_TAB
BEGIN
    DBMS_OUTPUT.PUT_LINE('Task is complete.');
END;
/
Trigger created.
```



```
INSERT INTO SERVER_TAB VALUES ('TEXT');
```



```
Task is complete.
1 row created.
```

To set the output to WORD_WWRAPPED, enter



```
SET SERVEROUTPUT ON FORMAT WORD_WWRAPPED
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 SHIFTINOUT is not supported in iSQL*Plus

Allows correct alignment for terminals that display shift characters. The SET SHIFTINOUT 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 iSQL*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 SQLBLANKLINES {ON|OFF}

SET SQLBLANKLINES is not supported in iSQL*Plus

Controls whether SQL*Plus allows 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[NUMBER] {ON|OFF}

SET SQLNUMBER is not supported in *i*SQL*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 or output format of VARIABLE 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, 8.1.7 or 9.0.0. In later releases, SQLPLUSCOMPATIBILITY may affect features other than VARIABLE.

Setting the value of SQLPLUSCOMPATIBILITY to a version less than 9.0.0 will result in VARIABLE definition of NCHAR or NVARCHAR2 datatypes to revert to Oracle8*i* behavior whereby the size of the variable is in bytes or characters depending on the chosen national character set.

The default glogin.sql file contains SET SQLPLUSCOMPAT 8.1.7. It is recommended that you add SET SQLPLUSCOMPAT 9.0.0 to your scripts to maximize their compatibility with future versions of SQL*Plus.

SET SQLPRE[FIX] {#|c}

SET SQLPREFIX is not supported in *i*SQL*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 *i*SQL*Plus

Sets the SQL*Plus command prompt.

Example

You need the Select Any Table privilege to successfully run the following example scripts.

To change your SQL*Plus prompt to display your username and SID, enter:

```
 SET SQLPROMPT '&_CONNECT_IDENTIFIER > '
```

To change your SQL*Plus prompt to display your SID enter:

```
 SET TERMOUT OFF
COLUMN X NEW_VALUE Y
SELECT RTRIM(INSTANCE, CHR(0)) X FROM V$THREAD;
SET SQLPROMPT '&Y SQL>'
SET TERMOUT ON
```

To set the SQL*Plus command prompt to show the current user, enter

```
 SET TERMOUT OFF
COLUMN D22 NEW_VALUE VAR
SELECT USERNAME D22 FROM USER_USERS;
SET SQLPROMPT '&&VAR>'
SET TERMOUT ON
```

These settings are not dynamic. You need to reset them whenever you change instances, such as when you use the connect command to log on to another instance.

SET SQL[TERMINATOR] {:|c|ON|OFF}

Sets the character used to end and execute SQL commands to *c*. 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. 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 *.UFI*, enter

```
 SET SUFFIX UFI
```



If you then enter

GET EXAMPLE

SQL*Plus will look for a file named EXAMPLE.UFI instead of EXAMPLE.SQL.

SET TAB {ON|OFF}

SET TAB is not supported in *i*SQL*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 *i*SQL*Plus

Controls the display of output generated by commands executed from a script. OFF suppresses the display so that you can spool output from a script without seeing the output on the screen. ON displays the output. TERMOUT OFF does not affect output from commands you enter interactively.

SET TI[ME] {ON|OFF}

SET TIME is not supported in *i*SQL*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. For information about the data SET TIMING ON displays, see the Oracle installation and user's manual(s) provided for your operating system. Refer to the [TIMING](#) command for information on timing multiple commands.

SET TRIM[OUT] {ON|OFF}

SET TRIMOUT is not supported in *i*SQL*Plus

Determines whether SQL*Plus allows 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 allows SQL*Plus to display trailing blanks. TRIMOUT ON does not affect spooled output.

SET TRIMS[POOL] {ON|OFF}

SET TRIMSPOOL is not supported in *i*SQL*Plus

Determines whether SQL*Plus allows trailing blanks at the end of each spooled line. ON removes blanks at the end of each line. OFF allows 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 to *c*. Note, *c* 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 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 allows 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.

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

REL[EASE]

REPF[OOTER]

REPH[EADER]

SGA

SPOO[L]

SQLCODE

TTI[TLE]

USER

Shows the value of a SQL*Plus system variable or the current SQL*Plus environment. SHOW SGA requires a DBA privileged login.

Terms

Refer to the following list for a description of each term or clause:

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 alter these widths using the COLUMN command.

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.

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.

REL[EASE]

Shows the release number of Oracle 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.
Note, you need SELECT ON V_\$SGA object privileges to use the SGA clause, 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"

Examples

To list the current LINESIZE, enter



```
SHOW LINESIZE
```

If the current linesize is 80 characters, SQL*Plus will give the following response:



```
LINESIZE 80
```

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 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

SHUTDOWN

Syntax

SHUTDOWN [ABORT|IMMEDIATE|NORMAL|TRANSACTIONAL [LOCAL]]

Shuts down a currently running Oracle instance, optionally closing and dismounting a database.

Terms

Refer to the following list for a description of each term or clause:

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 via a multi-threaded server. For more information about connecting to a database, see the [CONNECT](#) command earlier in this chapter.

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. Use preference settings to output to a file.

Syntax

SPO[OL] [*file_name*[.*ext*]|OFF|OUT]

Stores query results in a file, or optionally sends the file to a printer.

Terms

Refer to the following list for a description of each term or clause:

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).

OFF

Stops spooling.

OUT

Stops spooling and sends the file to your host 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 run interactively.

Examples

To record your output in the file DIARY using the default file extension, enter



SPOOL DIARY

To stop spooling and print the file on your default printer, enter



SPOOL OUT

START

Syntax

STA[RT] {*url*|*file_name[.ext]*} [*arg...*]

Runs the SQL*Plus statements in the specified script. The script can be called from a web server in iSQL*Plus, or from the local file system or a web server in SQL*Plus command-line. You can pass values to script variables in the usual way.

Terms

Refer to the following list for a description of each term or clause:

url

Specifies the Uniform Resource Locator of a script to run on the specified web server. SQL*Plus supports HTTP, FTP and gopher protocols.

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). For information on changing this default extension, see the [SUFFIX](#) variable of the [SET](#) command in this chapter.

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. Consult the Oracle installation and user's manual(s) 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.

For more information on using parameters, refer to the subsection "[Substitution Variables in iSQL*Plus](#)" under "[Writing Interactive Commands](#)" on page 9-2.

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 (see "[Disabling SQL*Plus, SQL, and PL/SQL Commands](#)" on page 10-4), also disables the @ and @@ commands. See the [@ \("at" sign\)](#) and [@@ \(double "at" sign\)](#) commands in this chapter for further information on these commands.

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* | *migrate_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 *migrate_options* has the following syntax:

[PFILE=*filename*] MIGRATE [QUIET]

Starts an Oracle instance with several options, including mounting and opening a database.

Terms

Refer to the following list for a description of each term and clause:

FORCE

Shuts down the current Oracle 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 allows Oracle 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.

MIGRATE

Starts the database in OPEN MIGRATE mode and sets system initialization parameters to specific values required to enable database upgrade or downgrade scripts to be run. MIGRATE should only be used when a database is first started with a new version of the Oracle Database Server.

See the *Oracle9i Database Migration* guide for details about preparing for, testing and implementing a database version migration or release upgrade or downgrade.

When run, upgrade or downgrade scripts transform an installed version or release of an Oracle database into another version, for example, to migrate an Oracle7 database to an Oracle9i database. Once the migration 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 via a multi-threaded server.

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 database administrators, 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 host operating system script.

Terms

Refer to the following list for a description of each term or clause:

SET

Saves the values of the system variables.

Refer to the [SAVE](#) command for information on the other terms and clauses in the STORE command syntax.

Usage

This command creates a script which can be executed with the [START](#), [@](#) or [@@](#) commands.

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

Refer to the following list for a description of each term or clause:

`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.

For information about the data TIMING displays, see the Oracle installation and user's manual(s) provided for your operating system. Refer to 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*:

COL <i>n</i>	CE[NTER]
S[KIP] [<i>n</i>]	R[IGHT]
TAB <i>n</i>	BOLD
LE[FT]	FORMAT <i>text</i>

Places and formats a specified title at the top of each report page or lists the current TTITLE definition. The old form of TTITLE is used if only a single word or string in quotes follows the TTITLE command.

For a description of the old form of TTITLE, see [TTITLE](#) on page C-7.

Terms

Refer to the following list for a description of each term or clause. 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 user 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 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.

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 **FORMAT** command 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.

Refer to the [FORMAT](#) clause of the [COLUMN](#) command in this chapter for more information on default formats.

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 NEW_VALUE](#) 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 2001' -
RIGHT 'Page:' FORMAT 999 SQL.PNO SKIP CENTER -
'Data in Thousands'
```



Monthly Analysis	01 Jan 2001	Page: 1
	Data in Thousands	

To suppress the top title display without changing its definition, enter



```
TTITLE OFF
```

UNDEFINE

Syntax

`UNDEF[INE] variable ...`

Deletes one or more user variables that you defined either explicitly (with the `DEFINE` command) or implicitly (with an argument to the `START` command).

Terms

Refer to the following for a description of the term or clause:

variable

Represents the name of the user variable you wish to delete. One or more user variables may be deleted in the same command.

Examples

To undefine a user variable named `POS`, enter



```
UNDEFINE POS
```

To undefine two user variables named `MYVAR1` and `MYVAR2`, enter



```
UNDEFINE MYVAR1 MYVAR2
```

VARIABLE

Syntax

```
VAR[ABLE] [variable [NUMBER|CHAR|CHAR (n [CHAR|BYTE])|NCHAR|NCHAR (n)  
|VARCHAR2 (n [CHAR|BYTE])|NVARCHAR2 (n)|CLOB|NCLOB|REFCURSOR]]
```

Declares a bind variable that can be referenced in PL/SQL. For more information on bind variables, see "[Using Bind Variables](#)" on page 6-31. For more information about PL/SQL, see your *PL/SQL User's Guide and Reference*.

VARIABLE without arguments displays a list of all the variables declared in the session. VARIABLE followed only by a variable name lists that variable.

Terms

Refer to the following list for a description of each term or clause:

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 Oracle9*i* 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 Oracle9*i* 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.

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. For more information, see the [PRINT](#) command in this chapter.

To automatically display the value of a bind variable created with VARIABLE, use the SET AUTOPRINT command. For more information, see the [SET AUTOPRINT](#) command in this chapter.

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 after completing a PRINT statement for that bind variable, or 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 *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 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 report 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 confidential information.

For more information on creating CLOB columns, see your *Oracle9i 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 Input area if an operating system error occurs.

Terms

Refer to the following list for a description of each term or clause:

[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](#) in this chapter for details.

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

The commands in the following script cause SQL*Plus to exit and COMMIT any pending changes if a failure occurs when reading from the output file:



```
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 Input area if a SQL command or PL/SQL block generates an error.

Terms

Refer to the following list for a description of each term or clause:

[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](#) in this chapter for details.

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 *i*SQL*Plus to stop processing the current script and return focus to the Input area on the Work screen:

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 *i*SQL*Plus to stop processing the current script and return focus to the Input area on the Work screen:



```
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 headIing "Employee Name"
```



Unknown COLUMN option "HEADIING"



```
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.....

14

SQL*Plus Error Messages

This appendix lists error messages with prefixes SP2- and CPY- generated by SQL*Plus and iSQL*Plus.

This chapter contains information about:

- [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, refer to the *Oracle9i Database Error Messages*.

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.

SP2-0028 Internal SQL*Plus Error - Invalid mode (*mode_number*)

Cause: An internal error occurred.

Action: Note the message and number, and contact Oracle Support Services.

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 again 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.

SP2-0051 Switch value is *switch_value* and is not handled properly

Cause: An internal error occurred.

Action: Note the message and number, and contact Oracle Support Services.

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.

SP2-0053 *column_name* not defined

Cause: The column name specified was not defined.

Action: Retry again with a valid column name.

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.

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.

SP2-0108 The names CREATE, REPLACE, APPEND, and abbreviations may not be used

Cause: The file name specified was the word "file".

Action: Put the name 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 DEFINE *variable* not added (no room)

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.

SP2-0145 Udalnk is not 12345. Probably a link error

Action: The SQL*Plus executable is not linked correctly.

Action: Make a note of the message and the number, then contact the System Administrator to re-link SQL*Plus.

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_name* option "*option_name*"

Usage: SET SHIFT[INOUT] [VIS[IBLE|INVISIBLE]]

SET NEWP[AGE] [1 | n | NONE]

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 not accessible

Cause: On-line SQL*Plus help is not installed in this Oracle instance.

Action: Contact the Database Administrator to install the on-line help.

SP2-0172 No HELP available

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).

SP2-0270 unknown flag in afiset *number* ignored

Cause: An unknown error occurred in the SET command.

Action: Make a note of the message, then contact Oracle Support Services.

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]]]
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

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*)

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: An buffer name contained an illegal character, for example hyphen (-).

Action: Correct and remove the illegal character from the buffer name.

SP2-0395 Usage: SQLPLUS [[<option>] [<logon>] [<start>]]

Where <option> ::= -H | -V | [-L] [-M <o>] [-R <n>] [-S]

-H displays the SQL*Plus version banner and usage syntax

-V displays the SQL*Plus version banner

-L attempts logon just once

-M <o> uses HTML markup options <o>

-R <n> uses restricted mode <n>

-S uses silent mode

<logon> ::= <username>[/<password>][@<connect_string>] | / | /NOLOG

<start> ::= @<URL> | <filename>[.<ext>] [<parameter> ...]

Cause: A SQL*Plus command option was invalid.

Action: Check the syntax for "[The SQLPLUS Command](#)" on page 4-3 for the correct usage.

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 number

Cause: The value entered in the ACCEPT command was not a number.

Action: Enter a valid number.

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.

SP2-0450 Usage: WHENEVER SQLERROR.

{ CONTINUE [COMMIT | ROLLBACK | NONE] | EXIT [SUCCESS | FAILURE | WARNING | n | <variable> | :<bindvariable>] [COMMIT | ROLLBACK] }

Cause: An option to WHENEVER SQLERROR was invalid in SQL*Plus.

Action: Specify a valid option.

SP2-0453 Usage: WHENEVER OSERROR

{CONTINUE [COMMIT | ROLLBACK | NONE] | EXIT [SUCCESS | FAILURE | WARNING | n | <variable> | :<bindvariable> | OSCODE] [COMMIT | ROLLBACK] }

Cause: An option to WHENEVER OSERROR was invalid in SQL*Plus.

Action: Specify a valid option.

SP2-0480 A missing FROM or TO clause uses the current SQL*Plus connection

Usage: COPY FROM <db> TO <db> <opt> <table> [(<cols>)] USING <sel>

<db> : database string, e.g., hr/hr@d:chicago-mktg

<opt> : ONE of the keywords: APPEND, CREATE, INSERT or REPLACE.

<table>: name of the destination table.

<cols> : a comma-separated list of destination column aliases.

<sel> : any valid SQL SELECT statement.

Cause: Usage for COPY command was specified incorrectly.

Action: Specify a valid option.

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 Invalid command *command_name*

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[IA]BLE] [<*variable*> [NUMBER | CHAR | CHAR (n | CHAR | BYTE) | VARCHAR2 (n | CHAR | BYTE) | NCHAR | NCHAR (n | NVARCHAR2 (n) | CLOB | NCLOB | REFCURSOR)]]

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 | 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

Cause: Missing file name or an invalid file name specified.

Action: Make sure that a file name was specified.

SP2-0559 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 [SIZE n] [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. This error may also occur if a SQL*Plus feature, for example SET AUTOTRACE, that uses SQL specific to Oracle was turned on when 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 ARRSIZE 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 | IMMEDIATE | 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.

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 *file_name*

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 allows file creation.

SP2-0607 Cannot close STORE file *file_name*

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

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

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 *Oracle9i 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!

Error in disabling roles in product user profile

Cause: These error messages are warnings that 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

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 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.**PASSW[ORD] [username]**

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**

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 alphanumerics 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.

SP2-0691 Expected SYSDBA or SYSOPER, not *command_name*

Cause: Attempted to use the CONNECT AS syntax and specified something other than SYSDBA or SYSOPER.

Action: Correct the syntax and issue the CONNECT command again.

SP2-0692 Usage: CONN[ECT] [*login*] [AS [SYSDBA | SYSOPER]]

Where <*login*> ::= <*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 You may need to set ORACLE_HOME to your Oracle software directory

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. 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. 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.

SP2-0753 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.

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 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), it is not allowed for security reasons, or it is an obsolete command.

Action: Remove the command from the 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, 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}]

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.

SP2-0857 iSQL*Plus restarted

Cause: Either the web server (Oracle HTTP server) handling your request has timed out and your session has expired, or the web server has halted. In either case session information (for example, current database connection, values of SET variables) is not available.

Action: Restart the web server (if necessary) and re-login to iSQL*Plus.

SP2-0858 Usage: SET MARKUP HTML [HEAD *text*] [BODY *text*] [TABLE *text*] [ENTMAP {ON | OFF}] [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 time-out 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 the browser to recognize the file are set correctly. Typically if you are loading a file with the extension .SQL, make sure the browser has a SQL MIME type.

SP2-0870 Exited normally

Cause: This is an informational message. You successfully exited out of iSQL*Plus.

Action: No action required.

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 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: No connection string was supplied in the URL argument for a dynamic report. That is, the userid keyword was not specified.

Action: Login via the interactive login page.

SP2-0881 *username[/password] [@connect_identifier]* | /

Cause: Incorrect syntax was used for the iSQL*Plus username in the connection string. No AS SYSDBA or AS SYSOPER clause can be included.

Action: Correct the syntax. Use the AS SYSDBA or AS SYSOPER field of the login page for privileged connections.

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 *isqlplus.conf* 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.

SP2-0888 Keyword keyword is not available in iSQL*Plus

Cause: Attempted to use a keyword or variable in an iSQL*Plus URL argument that was not recognized by iSQL*Plus, or that is only available through an iSQL*Plus DBA connection.

Action: Remove the keyword or variable argument, or use the iSQL*Plus DBA URL instead of the iSQL*Plus URL.

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.

SP2-0891 Enter connection details to load script

Cause: iSQL*Plus could not log in to the server because there was no URL "userid" argument, or the information supplied was insufficient or incorrect.

Action: Log in via the Login screen to load the script into the Work Screen.

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. This is a debugging message.

SP2-0893 Expired session

Cause: iSQL*Plus has expired the timed out session identified by the user session Id.

Cause: No action required. This is a debugging message.

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. This is a debugging message.

SP2-0895 Logged in *username* as *session* from *URL* to *connect_id*

Cause: iSQL*Plus logged in user with the given user session Id, username, URL and connect identifier.

Action: No action required. This is a debugging message.

SP2-0896 Failed to log out *username*

Cause: iSQL*Plus failed to log out user with given user session Id.

Action: No action required. This is a debugging message.

SP2-0897 Logged out *username*

Cause: iSQL*Plus logged out user with given user session Id.

Action: No action required. This is a debugging message.

SP2-0898 Number of active sessions is *number*

Cause: Number of active iSQL*Plus sessions is displayed.

Action: No action required. This is a debugging message.

SP2-0899 Number of sessions to be expired is *number*, active sessions is *number*

Cause: Displays the number of sessions that have timed out and are to be expired, and the resulting number of active sessions.

Action: No action required. This is a debugging message.

SP2-0900 *username* = *username*, *password* = *password*, connect id = *connect_id*, privilege = *privilege*

Cause: Displays iSQL*Plus log in details: username, password, connection identifier and privilege.

Action: No action required. This is a debugging message.

SP2-0901 *username* = *username*, *password* = *password*, connect id = *connect_id*

Cause: Displays iSQL*Plus log in details: username, password and connection identifier.

Action: No action required. This is a debugging message.

SP2-0902 connect string = *username/password@sid privilege*

Cause: Displays the complete syntax of the iSQL*Plus connect string: *username/password@sid [AS {SYSDBA | SYSOPER}]* as produced by the SQL*Plus connect API.

Action: No action required. This is a debugging message.

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 the URL, but no keywords were 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 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 Work screen.

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.

SP2-0919 Unknown OS

Cause: Cannot determine the operating system platform from the retrieved OS version information.

Action: No action required.

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".

SP2-0922 Unable to determine Windows version"

Cause: Cannot determine version of Windows using the get version API.

Action: No action required.

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 Script 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.

COPY Command Messages

CPY0002 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.

CPY0003 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.

CPY0004 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

CPY0005 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.

CPY0006 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.

CPY0007 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.

CPY0008 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.

CPY0009 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.

CPY0012 Object datatypes cannot be copied

Cause: An attempt was made to copy an object 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 the "["COPY"](#) on page 13-48 command.

Part IV

SQL*Plus Appendixes

This section contains the following SQL*Plus appendixes:

- [SQL*Plus Limits](#)
- [SQL*Plus COPY Command](#)
- [Obsolete SQL*Plus Commands](#)
- [Commands Not Supported in iSQL*Plus](#)

A

SQL*Plus Limits

This appendix lists general SQL*Plus limits. The limits shown are valid for most operating systems.

Table A-1 SQL*Plus Limits

Item	Limit
filename length	system dependent
username length	30 bytes
user variable name length	30 bytes
user variable value length	240 characters
command-line length	2500 characters
length of a LONG value entered through SQL*Plus	LINESIZE value
LINESIZE	system dependent
LONGCHUNKSIZE value	system dependent
output line size	system dependent
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	60,000 characters for VMS; otherwise, 32,767 characters
maximum ARRAYSIZE	5000 rows
maximum number of nested scripts	20 for VMS, CMS, Unix; otherwise, 5
maximum page number	99,999
maximum PL/SQL error message size	2K
maximum ACCEPT character string length	240 Bytes
maximum number of DEFINE variables	2048

B

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 [Chapter 1, "SQL*Plus Overview"](#).

The COPY command will be obsoleted in future releases of SQL*Plus. COPY supports the datatypes listed for the COPY command, but no new datatypes will be supported.

COPY Command Syntax

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 a local or remote database. COPY supports the following datatypes:

CHAR
DATE
LONG
NUMBER
VARCHAR2

Terms

Refer to 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.

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.

database

Specifies *username[/password] @connect_identifier* of the Oracle source or destination database you wish to COPY FROM or COPY TO. If you do not specify *password* in either the COPY FROM clause or the COPY TO clause, SQL*Plus will prompt you for it. SQL*Plus suppresses the display of your password response.

You must include the *connect_identifier* clause which consists of an Oracle Net connection string, to specify the source or destination database. The exact syntax depends upon the Oracle Net communications protocol your Oracle installation uses. For more information, refer to the Oracle Net manual appropriate for your protocol 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 the *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/your_password@HQ TO JOHN/your_password@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/your_password@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/your_password@BOSTONDB -
TO TODD/your_password@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 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 above). For more information, see "[Controlling Treatment of the Destination Table](#)" later in this chapter.

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/your_password@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 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/your_password@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 D:BOSTON-MFG as HR, with the password *your_password*.

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 13-95.

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/your_password@BOSTONDB -
CREATE EMPLOYEE_COPY2 -
USING SELECT * FROM ADAMS.DEPT
```

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 password and the service name for your local database in either a FROM or a TO clause (omit the other clause):

```
COPY FROM HR/your_password@MYDATABASE -
INSERT EMPLOYEE_COPY2 -
USING SELECT * FROM EMPLOYEE_COPY
```

To copy between tables on a remote database, include the same username, password, and service name in the FROM and TO clauses:

```
COPY FROM HR/your_password@BOSTONDB -
TO HR/your_password@BOSTONDB -
INSERT EMPLOYEE_COPY2 -
USING SELECT * FROM EMPLOYEE_COPY
```


C

Obsolete SQL*Plus Commands

This appendix covers earlier versions of some SQL*Plus commands. While these older commands still function within SQL*Plus, they are no longer 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 see 13-23	Places and formats a title at the bottom of each report page or lists the current BTITLE definition.
COLUMN DEFAULT	COLUMN CLEAR see 13-29	Resets column display attributes to default values.
DOCUMENT	REMARK see 13-86	Places a comment which SQL*Plus does not interpret as a command.
NEWPAGE	SET NEWPAGE see 13-114	Sets the number of blank lines to be printed from the top of each page to the top title.
SET BUFFER	EDIT see 13-61	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 CLOSECURSOR	none	Obsolete
SET DOCUMENT	none	Obsolete
SET MAXDATA	none	Obsolete
SET SCAN	SET DEFINE see 13-105	Sets the character used to prefix substitution variables.
SET SPACE	SET COLSEP see 13-104	Sets the text to be printed between SELECTed columns.
SET TRUNCATE	SET WRAP see 13-123	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 see 13-141	Places and formats a title at the top of each report page or lists the current TTITLE definition.

BTITLE (old form)

Purpose

Displays a title at the bottom of each report page.

Syntax

BTITLE [*text*]

Usage Notes

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. Refer to [TTITLE \(old form\)](#) in this appendix for more details.

COLUMN DEFAULT

Purpose

Resets the display attributes for a given column to default values.

Syntax

COL[UMN] {*column|exp*} DEF[AULT]

Usage Notes

Has the same effect as COLUMN CLEAR.

DOCUMENT

Purpose

Begins a block of documentation in a script.

Syntax

DOC[UMENT]

Usage Notes

For information on the current method of inserting comments in a script, refer to the section "[Placing Comments in Scripts](#)" on page 6-10 and to the [REMARK](#) command on page 13-86.

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. (See "["SET DOCUMENT"](#)" later in this appendix.)

NEWPAGE

Purpose

Advances spooled output *n* lines beyond the beginning of the next page.

Syntax

NEWPAGE [*1|n*]

Usage Notes

Refer to the [NEWPAGE](#) variable of the [SET](#) command on page 13-114 for information on the current method for advancing spooled output.

SET BUFFER

Purpose

Makes the specified buffer the current buffer.

Syntax

SET BUF[FER] {buffer|SQL}

Usage Notes

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 already 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 CLOSECURSOR

Purpose

Sets the cursor usage behavior.

Syntax

SET CLOSECUR[SOR] {ON|OFF}

Usage Notes

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 DOCUMENT

Purpose

Displays or suppresses blocks of documentation created by the DOCUMENT command.

Syntax

SET DOC[UMENT] {ON|OFF}

Usage Notes

SET DOCUMENT ON causes blocks of documentation to be echoed to the screen. Set DOCUMENT OFF suppresses the display of blocks of documentation.

See [DOCUMENT](#) in this appendix for information on the DOCUMENT command.

SET MAXDATA

Purpose

Sets the maximum total row width that SQL*Plus can process.

Syntax

SET MAXD[ATA] *n*

Usage Notes

In SQL*Plus, the maximum row width is now unlimited. Any values you set using SET MAXDATA are ignored by SQL*Plus.

SET SCAN

Purpose

Controls scanning for the presence of substitution variables and parameters. OFF suppresses processing of substitution variables and parameters; ON allows normal processing.

Syntax

SET SCAN {ON|OFF}

Usage Notes

ON functions in the same manner as SET DEFINE ON.

SET SPACE

Purpose

Sets the number of spaces between columns in output. The maximum value of *n* is 10.

Syntax

SET SPACE {1|*n*}

Usage Notes

The SET SPACE 0 and SET COLSEP " commands have the same effect. This command is obsoleted 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 TRUNCATE

Purpose

Controls whether SQL*Plus truncates or wraps a data item that is too long for the current line width.

Syntax

SET TRU[NCATE] {ON|OFF}

Usage Notes

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.

SHOW LABEL

Purpose

Shows the security level for the current session.

Syntax

SHO[W] LABEL

TTITLE (old form)

Purpose

Displays a title at the top of each report page.

Syntax

TTI[TLE] *text*

Usage Notes

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 will display.

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 the [ESCAPE](#) variable of the [SET](#) command on page 13-108 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 13-141.

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'
```

D

Commands Not Supported in *iSQL*Plus*

This appendix lists SQL*Plus commands not supported in the *iSQL*Plus* user interface. Attempting to use any of the following unsupported commands or command options raises an SP2-0850 error message.

The following commands have no context in *iSQL*Plus* and have not been implemented.

ACCEPT	PASSWORD
CLEAR SCREEN	PAUSE

The following SET command variables have no context in *iSQL*Plus* and have not been implemented.

SET EDITFILE	SET SQLBLANKLINES	SET TAB
SET FLUSH	SET SQLCONTINUE	SET TERMOUT
SET NEWPAGE	SET SQLNUMBER	SET TIME
SET PAUSE	SET SQLPREFIX	SET TRIMOUT
SET SHIFTINOUT	SET SQLPROMPT	SET TRIMSPPOOL
SET SHOWMODE	SET SUFFIX	

The following commands have security issues on the middle tier and have not been implemented.

GET	SPOOL
HOST	STORE

The following commands are SQL buffer editing commands which are not relevant in *iSQL*Plus* and have not been implemented.

APPEND	DEL	INPUT
CHANGE	EDIT	SAVE

Glossary

account

An authorized user of an operating system or a product (such as Oracle database server or Oracle Forms). Depending on the operating system, may be referred to as ID, User ID, login, and so on. Accounts are often created and controlled by a system administrator.

alias

In SQL, a temporary name assigned to a table, view, column, or value within a SQL statement, used to refer to that item later in the same statement or in associated SQL*Plus commands.

alignment

The way in which data is positioned in a field. It may be positioned to the left, right, center, flush/left, flush/right, or flush/center of the defined width of a field.

anonymous block

A PL/SQL program unit that has no name and does not require the explicit presence of the BEGIN and END keywords to enclose the executable statements.

archived redo log

Recovery structure where online redo log files are archived before being reused.

ARCHIVELOG

Redo log mode where the filled online redo log files are archived before they are reused in the cycle. In ARCHIVELOG mode, the database can be completely recovered from both instance and disk failure. The database can also be backed up while it is open and available for use. However, additional administrative

operations are required to maintain the archived redo log. See also [archived redo log](#).

argument

A data item following the script name in a START command. The argument supplies a value for a parameter in the script.

array processing

Processing performed on multiple rows of data rather than one row at a time. In some Oracle utilities such as SQL*Plus, Export/Import, and the precompilers, users can set the size of the array; increasing the array size often improves performance.

ASCII

A convention for using digital data to represent printable characters. ASCII is an acronym for American Standard Code for Information Interchange.

autocommit

A feature unique to SQL*Plus that enables SQL*Plus to automatically commit changes to the database after every successful execution of a SQL command or PL/SQL block. Setting the AUTOCOMMIT variable of the SET command to ON enables this feature. Setting the AUTOCOMMIT variable to *n* enables this feature after every *n* successful INSERT, UPDATE or DELETE commands or PL/SQL blocks.

background process

A non-interactive process that runs in an operating system environment and performs some service or action. Certain Oracle database server products use background processes for different tasks, such as performing and coordinating tasks on behalf of concurrent users of the database, processing and delivering electronic messages, and managing printing services.

bind reference

A reference to a parameter used to replace a single literal value (for example, a character string, number, or date) appearing anywhere in a PL/SQL construct or a SQL SELECT statement. For a bind reference, you must precede the parameter name with a colon (:).

bind variable

A variable in a SQL statement that must be replaced with a valid value, or the address of a value, in order for the statement to successfully execute.

bit

The smallest unit of data. A bit only has two possible values, 0 or 1. Bits can be combined into groups of eight called bytes; each byte represents a single character of data. See also [byte](#).

block

In PL/SQL, a group of SQL and PL/SQL commands related to each other through procedural logic.

body

A report region that contains the bulk of the report (text, graphics, data, and computations).

break

An event, such as a change in the value of an expression, that occurs while SQL*Plus processes a query or report. You can direct SQL*Plus to perform various operations, such as printing subtotals, whenever specified breaks occur.

break column

A column in a report that causes a break when its value changes and for which the user has defined break operations.

break group

A group containing one or more break columns.

break hierarchy

The order in which SQL*Plus checks for the occurrence of breaks and triggers the corresponding break operations.

break order

Indicates the order in which to display a break column's data. Valid options are Ascending and Descending.

break report

A report that divides rows of a table into “sets”, based on a common value in the break column.

buffer

An area where the user's SQL statements or PL/SQL blocks are temporarily stored. The SQL buffer is the default buffer. You can edit or execute commands from multiple buffers; however, SQL*Plus does not require the use of multiple buffers.

byte

A group of eight sequential bits that represents a letter, number, or symbol (that is, a character). Treated as a unit of data by a computer.

CGI script

See [Common Gateway Interface](#).

CHAR datatype

An Oracle datatype provided for ANSI/ISO compatibility. A CHAR column is a fixed-length column and can contain any printable characters, such as A, 3, &, or blanks, and can have from 1 to 2000 bytes or can be null. For more information about the CHAR datatype, refer to the *Oracle9i SQL Reference*.

character

A single location on a computer system capable of holding one alphabetic character or numeric digit. One or more characters are held in a field. One or more fields make up a record, and one or more records may be held in a file or database table.

character string

A group of sequential letters, numerals, or symbols, usually comprising a word or name, or portion thereof.

clause

A part of a SQL statement that does not constitute the full statement; for example, a "WHERE clause".

client

A user, software application, or computer that requests the services, data, or processing of another application or computer (the "server"). In a two-task environment, the client is the user process. In a network environment, the client is the local user process and the server may be local or remote.

CLOB datatype

A standard Oracle datatype. The CLOB datatype is used to store single-byte character large object data, and can store up to 2 gigabytes of character data.

column

A vertical space in a database table that represents a particular domain of data. A column has a column name and a specific datatype. For example, in a table of employee information, all of the employees' dates of hire would constitute one column. A record group column represents a database column.

column expression

An expression in a SELECT statement that defines which database column(s) are retrieved. It may be a column name or a valid SQL expression referencing a column name.

column heading

A heading created for each column appearing in a report.

command

An instruction to or request of a program, application, operating system, or other software, to perform a particular task. Commands may be single words or may require additional phrases, variously called arguments, options, parameters, and qualifiers. Unlike statements, commands execute as soon as you enter them. ACCEPT, CLEAR, and COPY are examples of commands in SQL*Plus.

command file

See [script](#).

command-line

A line on a computer display on which typed in commands appear. An example of a command-line is the area next to the DOS prompt on a personal computer. See also [prompt](#).

command prompt

The text, by default SQL>, with which SQL*Plus requests your next command.

comment

A language construct for the inclusion of explanatory text in a program, the execution of which remains unaffected.

commit

To make permanent changes to data (inserts, updates, deletes) in the database. Before changes are committed, both the old and new data exist so that changes can be stored or the data can be restored to its prior state.

Common Gateway Interface

The Common Gateway Interface (CGI) describes a part of a web server that allows user interaction, typically via a web browser, with programs running on the server. CGI scripts enable this user interaction to create dynamic web pages or web page elements, or to take user input and respond accordingly. A very common use is to provide an interactive form which a user completes online and then submits. Some common languages in use for CGI scripts are Perl, JavaScript and Java

computation

Used to perform runtime calculations on data fetched from the database. These calculations are a superset of the kinds of calculations that can be done directly with a SELECT statement. See also [formula column](#).

computed column

See [computation](#).

configuration

In Oracle Net, the set of instructions for preparing network communications, as outlined in the Oracle Net documentation.

configuration files

Files that are used to identify and characterize the components of a network. Configuration is largely a process of naming network components and identifying relationships among those components.

connect

To identify yourself to Oracle by entering your username and password in order to gain access to the database. In SQL*Plus, the CONNECT command allows you to log off Oracle and then log back on with a specified username.

connect identifier

The set of parameters, including a protocol, that Oracle Net uses to connect to a specific Oracle instance on the network.

current line

In an editor, such as the SQL*Plus editor, the line in the current buffer that editing commands will currently affect.

database

A set of operating system files, treated as a unit, in which an Oracle database server stores a set of data dictionary tables and user tables. A database requires three types of files: database files, redo log files, and control files.

database administrator (DBA)

(1) A person responsible for the operation and maintenance of an Oracle database server or a database application. The database administrator monitors its use in order to customize it to meet the needs of the local community of users. (2) An Oracle username that has been given DBA privileges and can perform database administration functions. Usually the two meanings coincide. There may be more than one DBA per site.

database instance failure

Failure that occurs when a problem arises that prevents an Oracle database instance (SGA and background processes) from continuing to work. Instance failure may result from a hardware problem such as power outage, or a software problem, such as operating system crash. When an instance failure occurs, the data in the buffers of the SGA is not written to the datafiles.

database link

An object stored in the local database that identifies a remote database, a communication path to the remote database, and optionally, a username and password for it. Once defined, a database link can be used to perform queries on tables in the remote database. Also called *DBlink*. In SQL*Plus, you can reference a database link in a DESCRIBE or COPY command.

database object

Something created and stored in a database. Tables, views, synonyms, indexes, sequences, clusters, and columns are all examples of database objects.

database server

The computer which runs the ORACLE Server kernel and contains the database.

database specification

An alphanumeric code that identifies a database, used to specify the database in Oracle Net operations and to define a database link. In SQL*Plus, you can reference a database specification in a COPY, CONNECT, or SQLPLUS command.

database string

A string of Oracle Net parameters used to indicate the network prefix, the host system you want to connect to, and the system ID of the database on the host system.

Data Control Language (DCL)

The category of SQL statements that control access to the data and to the database. Examples are the GRANT and REVOKE statements. Occasionally DCL statements are grouped with DML statements.

Data Definition Language (DDL)

The category of SQL statements that define or delete database objects such as tables or views. Examples are the CREATE, ALTER, and DROP statements.

data dictionary

A comprehensive set of tables and views automatically created and updated by the Oracle database server, which contains administrative information about users, data storage, and privileges. It is installed when Oracle is initially installed and is a central source of information for the Oracle database server itself and for all users of Oracle. The tables are automatically maintained by Oracle. It is sometimes referred to as the *catalog*.

Data Manipulation Language (DML)

The category of SQL statements that query and update the database data. Common DML statements are SELECT, INSERT, UPDATE, and DELETE. Occasionally DCL statements are grouped with DML statements.

data security

The mechanisms that control the access and use of the database at the object level. For example, data security includes access to a specific schema object and the specific types of actions allowed for each user on the object (for example, user HR can issue SELECT and INSERT statements but not DELETE statements using the EMP table). It also includes the actions, if any, that are audited for each schema object.

datatype

(1) A standard form of data. The Oracle datatypes are CHAR, NCHAR, VARCHAR2, NVARCHAR2, DATE, NUMBER, LONG, CLOB, NCLOB, RAW, LONG RAW and XMLType; however, the Oracle database server recognizes and converts other standard datatypes. (2) A named set of fixed attributes that can be

associated with an item as a property. Data typing provides a way to define the behavior of data.

DATE datatype

A standard Oracle datatype used to store date and time data. Standard date format is DD-MMM-YY, as in 23-NOV-98. A DATE column may contain a date and time between January 1, 4712 BC to December 31, 9999 AD.

DBA

See [database administrator \(DBA\)](#).

DCL

See [Data Control Language \(DCL\)](#).

DDL

See [Data Definition Language \(DDL\)](#).

default

A clause or option value that SQL*Plus uses if you do not specify an alternative.

default database

See [local database](#).

directory

On some operating systems, a named storage space for a group of files. It is actually one file that lists a set of files on a particular device.

dismounted database

A database that is not mounted by any instance, and thus cannot be opened and is not currently available for use.

display format

See [format](#).

display width

The number of characters or spaces allowed to display the values for an output field.

DML

See [Data Manipulation Language \(DML\)](#).

DUAL table

A standard Oracle database table named DUAL, which contains exactly one row. The DUAL table is useful for applications that require a small “dummy” table (the data is irrelevant) to guarantee a known result, such as “true.”

editor

A program that creates or modifies files.

end user

The person for whom a system is being developed; for example, an airline reservations clerk is an end user of an airline reservations system. See also [SQL*Plus](#).

error message

A message from a computer program (for example, SQL*Plus) informing you of a potential problem preventing program or command execution.

expression

A formula, such as SALARY + COMMISSION, used to calculate a new value from existing values. An expression can be made up of column names, functions, operators, and constants. Formulas are found in commands or SQL statements.

extension

On some operating systems, the second part of the full file specification. Several standard file extensions are used to indicate the type or purpose of the file, as in file extensions of SQL, LOG, LIS, EXE, BAT, and DIR. Called file type on some operating systems.

file

A collection of data treated as a unit, such as a list, document, index, note, set of procedures, and so on. Generally used to refer to data stored on magnetic tapes or disks. See also [filename](#), [extension](#), and [file type](#).

filename

The name component of a file specification. A filename is assigned by either the user or the system when the file itself is created. See also [extension](#) and [file type](#).

file type

On some operating systems, the part of the filename that usually denotes the use or purpose of the file. See [extension](#).

format

Columns contain information in one of four types; users can specify how they want a query to format information it retrieves from character, number, date, or long columns. For example, they can choose to have information of type date appear as 23/11/98, or Monday Twenty-third November 1998, or any other valid date format.

format model

A clause element that controls the appearance of a value in a report column. You specify predefined format models in the COLUMN, TTITLE, and BTITLE commands' FORMAT clauses. You can also use format models for DATE columns in SQL date conversion functions, such as TO_DATE.

form feed

A control character that, when executed, causes the printer to skip to the top of a new sheet of paper (top of form). When SQL*Plus displays a form feed on most terminals, the form feed clears the screen.

formula column

Manually-created column that gets its data from a PL/SQL procedure, function, or expression, user exit, SQL statement, or any combination of these.

function

A PL/SQL subprogram that executes an operation and returns a value at the completion of the operation. A function can be either built-in or user-named. Contrast with [procedure](#).

heading

In SQL*Plus, text that names an output column, appearing above the column. See also [column heading](#).

host computer

The computer from which you run SQL*Plus.

HTML

HTML (HyperText Markup Language) is the language used to write most of the documents available on the World Wide Web. It provides display and linking

specifications that are recognized by most web browsers. The HTML recommendation is sponsored by the World Wide Web Consortium (w3) and further details about the w3 and the HTML recommendation can be found at the w3 web site: <http://www.w3.org>.

instance

The background processes and memory area required to access an Oracle database. A database system requires one instance and one database. An Oracle database server consists of an SGA and a set of Oracle database server system processes.

instance failure

See [database instance failure](#).

instance recovery

Recovery of an instance in the event of software or hardware failure, so that the database is again available to users. If the instance terminates abnormally, then the instance recovery automatically occurs at the next instance startup.

iSQL*Plus

iSQL*Plus is a browser-based interface to SQL*Plus. It is a component of the SQL*Plus product.

iSQL*Plus enables you to use a web browser to connect to Oracle9*i* and perform the same actions as you would through the command-line version of SQL*Plus. You can use iSQL*Plus to write SQL*Plus, SQL and PL/SQL commands to:

- Enter, edit, run and save SQL commands and PL/SQL blocks.
- Calculate, and print query results.
- List column definitions for any table.
- Access and copy data between databases.
- Perform database administration.

iSQL*Plus Server

The iSQL*Plus Server is located on the middle tier of the iSQL*Plus three-tier architecture. It comprises the SQL*Plus engine and the iSQL*Plus module. In combination with the web server provided by the Oracle HTTP Server, they provide the iSQL*Plus web enabled interface to Oracle9*i*.

Julian date

An algorithm for expressing a date in integer form, using the SQL function JDATE. Julian dates allow additional arithmetic functions to be performed on dates.

justification

See [alignment](#).

label

Defines the label to be printed for the computed value in the COMPUTE command. The maximum length of a COMPUTE label is 500 characters.

LGWR

See [Log Writer \(LGWR\)](#).

local database

The database that SQL*Plus connects to when you start SQL*Plus, ordinarily a database on your host computer. Also called a default database. See also [remote database](#).

log in (or log on)

To perform a sequence of actions at a terminal that establishes a user's communication with the operating system and sets up default characteristics for the user's terminal session.

log off (or log out)

To terminate interactive communication with the operating system, and end a terminal session.

Log Writer (LGWR)

A background process used by an Oracle instance. LGWR writes redo log entries to disk. Redo log data is generated in the redo log buffer of the system global area. As transactions commit and the log buffer fills, LGWR writes redo log entries into an online redo log file.

logon string

A user-specified command-line, used to run an application that is connected to either a local or remote database. The logon string either explicitly includes a connect identifier or implicitly uses a default connect identifier.

LONG datatype

One of the standard Oracle datatypes. A LONG column can contain any printable characters such as A, 3, &, or a blank, and can have any length from 0 to 2 gigabytes.

MARKUP

Refers to the SET MARKUP clause or the SQLPLUS -MARKUP clause that permits SQL*Plus output to be generated in HTML format for delivery on the Internet. SQL*Plus output generated in HTML can be viewed with any web browser supporting HTML 3.2.

mounted database

A database associated with an Oracle instance. The database may be opened or closed. A database must be both mounted and opened to be accessed by users. A database that has been mounted but not opened can be accessed by DBAs for some maintenance purposes.

multi-threaded server

Allows many user processes to share a small number of server processes, minimizing the number of server processes and maximizing the utilization of available system resources.

NCHAR datatype

Beginning with Oracle9*i*, the NCHAR datatype is redefined to be a Unicode-only datatype. The NCHAR datatype specifies a fixed-width national character set character string, with width specifications referring to the number of characters, and can have a maximum column size up to 2000 bytes. For more information about the NCHAR datatype, refer to the *Oracle9*i* SQL Reference*.

NCLOB datatype

A standard Oracle datatype. The NCLOB datatype is used to store fixed-width national character set character (NCHAR) data, and can store up to 4 gigabytes of character text data.

Net8

See Oracle Net.

network

A group of two or more computers linked together through hardware and software to allow the sharing of data and/or peripherals.

NLS_LENGTH_SEMANTICS

NLS_LENGTH_SEMANTICS is an environmental parameter used by the SQL*Plus client application to enable you to create CHAR and VARCHAR2 columns and variables using either byte or character length semantics. NCHAR, NVARCHAR2, CLOB and NCLOB columns are always character-based, and hence are not affected by this variable. If this variable has not been explicitly set at session startup, a default value of BYTE is used (Byte length semantics). The value of NLS_LENGTH_SEMANTICS is then applied as the length semantics of any CHAR or VARCHAR2 declarations which DO NOT explicitly state the length qualifier. NLS_LENGTH_SEMANTICS is also used when displaying variables, or describing tables, views, synonyms, or other objects. On the server side, NLS_LENGTH_SEMANTICS can be set as an initialization parameter, and can be dynamically altered via the 'ALTER SESSION' and 'ALTER SYSTEM' SQL commands. For more information about setting NLS_LENGTH_SEMANTICS on the server side, refer to the *Oracle9i Database Globalization Support Guide*. Note that NLS_LENGTH_SEMANTICS may differ between the client and server, but the issuing of an ALTER SESSION SET NLS_LENGTH_SEMANTICS=value command to alter the session scope, will be reflected in the SQL*Plus session.

null

A value that means, "a value is not applicable" or "the value is unknown". Nulls are not equal to any specific value, even to each other. Comparisons with nulls are always false.

NULL value

The absence of a value.

NUMBER datatype

A standard Oracle datatype. A NUMBER column can contain a number, with or without a decimal point and a sign, and can have from 1 to 105 decimal digits (only 38 digits are significant).

NVARCHAR2 datatype

Beginning with Oracle9*i*, the NVARCHAR2 datatype is redefined to be a Unicode-only datatype. The NVARCHAR2 datatype specifies a variable-width national character set character string, with width specifications referring to the number of characters, and can have a maximum column size up to 4000 bytes. For more information about the NVARCHAR2 datatype, refer to the *Oracle9i SQL Reference*.

object

An object is an instance of an object type. In Oracle9*i*, objects can be persistent (i.e. stored in the database) or transient (i.e. PL/SQL or Oracle Call Interface™ (OCI) variables). See also [object type](#).

object-relational model

A database model that combines the key aspects of the relational and object data models into a single system. Oracle9*i* is an object-relational database system.

object type

A user-defined type that models a structure and behavior of an object. Equivalent to the concept of a class in different programming languages. In Oracle9*i*, object types have public interfaces with attributes and methods. Object types are also known as abstract data types.

online redo log

(1) Redo log files that have not been archived, but are either available to the instance for recording database activity or are filled and waiting to be archived or reused. (2) A set of two or more online redo log files that record all committed changes made to the database.

open database

A database that has been mounted and opened by an instance and is available for access by users. If a database is open, users can access the information it contains. See also [mounted database](#).

operating system

The system software that manages a computer's resources, performing basic tasks such as allocating memory and allowing computer components to communicate.

Oracle Net

Oracle's remote data access software that enables both client-server and server-server communications across any network. Oracle Net supports distributed processing and distributed database capability. Oracle Net runs over and interconnects many communications protocols. Oracle Net is backward compatible with Net8 and SQL*Net version 2.

Oracle Server

The relational database management system (RDBMS) sold by Oracle Corporation. Components of Oracle Server include the kernel and various utilities for use by DBAs and database users.

output

Results of a report after it is run. Output can be displayed on a screen, stored in a file, or printed on paper.

output file

File to which the computer transfers data.

packages

A method of encapsulating and storing related procedures, functions, and other package constructs together as a unit in the database. While packages provide the database administrator or application developer organizational benefits, they also offer increased functionality and database performance.

page

A screen of displayed data or a sheet of printed data in a report.

parallel server

Some hardware architectures (for example, loosely coupled processors) allow multiple computers to share access to data, software, or peripheral devices. With systems that have the parallel server option, Oracle can take advantage of such hardware platforms by running multiple database instances that share a single physical database. In appropriate applications, the Oracle Parallel Server allows access to a single database by the users on multiple machines with increased database performance.

parameter

A substitution variable consisting of an ampersand followed by a numeral (&1, &2, and so on.). You use parameters in a script and pass values into them through the arguments of the START command.

parameter file

A file used by Oracle9*i* Server to provide specific values and configuration settings to be used on database startup. For more information about the function of the parameter file, see the *Oracle9*i* Database Administrator's Guide*.

password

A secondary identification word (or string of alphanumeric characters) associated with a username. A password is used for data security and known only to its owner. Passwords are entered in conjunction with an operating system login ID, Oracle username, or account name in order to connect to an operating system or software application (such as the Oracle database). Whereas the username or ID is public, the secret password ensures that only the owner of the username can use that name, or access that data.

PL/SQL

The 3GL Oracle procedural language extension of SQL. PL/SQL combines the ease and flexibility of SQL with the procedural functionality of a structured programming language, such as IF...THEN, WHILE, and LOOP. Even when PL/SQL is not stored in the database, applications can send blocks of PL/SQL to the database rather than individual SQL statements, thereby reducing network traffic.

PL/SQL is interpreted and parsed at runtime, it does not need to be compiled.

procedure

A set of SQL and PL/SQL statements grouped together as an executable unit to perform a very specific task. Procedures and functions are nearly identical; the only difference between the two is that functions always return a single value to the caller, while procedures do not return a value to the caller.

process

(1) A thread of control in an operating system; that is, a mechanism in an operating system that can execute a series of steps. Some operating systems use the terms job or task. A process normally has its own private memory area in which it runs.

prompt

(1) A message from a computer program that instructs you to enter data or take some other action. (2) Word(s) used by the system as a cue to assist a user's response. Such messages generally ask the user to respond by typing some information in the adjacent field. See also [command-line](#).

query

A SQL SELECT statement that retrieves data, in any combination, expression, or order. Queries are read-only operations; they do not change any data, they only retrieve data. Queries are often considered to be DML statements.

query results

The data retrieved by a query.

RAW datatype

A standard Oracle datatype, a RAW data column may contain data in any form, including binary. You can use RAW columns for storing binary (non-character) data.

RDBMS (Relational Database Management System)

An Oracle7 (and earlier) term. Refers to the software used to create and maintain the system, as well as the actual data stored in the database. See also [Relational Database Management System \(RDBMS\)](#), [Server](#) and [Oracle Server](#).

record

A synonym for row; one row of data in a database table, having values for one or more columns.

recover

The Oracle process of restoring all or part of a database from specified redo log files.

redo log

A sequential log of all changes made to the data. The redo log is written and used in the event of a failure that prevents changes from being written to disk. The redo log consists of two or more redo log files.

redo log file

A file containing records of all changes made to the database. These files are used for recovery purposes. See also [redo log](#).

Relational Database Management System (RDBMS)

An Oracle7 (and earlier) term. A computer program designed to store and retrieve shared data. In a relational system, data is stored in tables consisting of one or more rows, each containing the same set of columns. Oracle is a relational database management system. Other types of database systems are called hierarchical or network database systems.

remark

In SQL*Plus, a comment you can insert into a script with the REMARK command.

remote computer

A computer on a network other than the local computer.

remote database

A database other than your default database, which may reside on a remote computer; in particular, one that you reference in the CONNECT, COPY, and SQLPLUS commands.

report

(1) The results of a query. (2) Any output, but especially output that has been formatted for quick reading, in particular, output from SQL*Plus.

reserved word

(1) A word that has a special meaning in a particular software or operating system. (2) In SQL, a set of words reserved for use in SQL statements; you cannot use a reserved word as the name of a database object.

roles

Named groups of related privileges that are granted to users or other roles.

rollback

To discard pending changes made to the data in the current transaction using the SQL ROLLBACK command. You can roll back a portion of a transaction by identifying a savepoint.

row

(1) Synonym for record; one row of data in a database table, having values for one or more columns. Also called tuple. (2) One set of field values in the output of a query. See also [column](#).

schema

A collection of logical structures of data, or schema objects. A schema is owned by a database user and has the same name as that user.

script

A file containing a sequence of commands that you can otherwise enter interactively. The file is saved for convenience and re-execution. Scripts are often called by operating-system specific names. In SQL*Plus, you can execute the script with the START, @ or @@ commands.

security level

The combination of a hierarchical classification and a set of non-hierarchical compartments that represent the sensitivity of information.

select

To fetch rows from one or more database tables using a query (the SQL statement SELECT).

SELECT list

The list of items that follow the keyword SELECT in a query. These items may include column names, SQL functions, constants, pseudo-columns, calculations on columns, and aliases. The number of columns in the result of the query will match the number of items in the SELECT list.

SELECT statement

A SQL statement that specifies which rows and columns to fetch from one or more tables or views. See also [SQL statement](#).

Server

Oracle software that handles the functions required for concurrent, shared data access to an Oracle database. The server portion receives and processes SQL and PL/SQL statements originating from client applications. The computer that manages the server portion must be optimized for its duties.

session

The time after a username connects to an Oracle database and before disconnecting, and the events that happen in that time.

SET command variable

See [system variable](#).

SGA

See also [System Global Area \(SGA\)](#).

spooling

Sending or saving output to a disk storage area. Often used in order to print or transfer files. The SQL*Plus SPOOL command controls spooling.

SQL (Structured Query Language)

The internationally accepted standard for relational systems, covering not only query but also data definition, manipulation, security and some aspects of referential integrity. See also [Data Manipulation Language \(DML\)](#), [Data Definition Language \(DDL\)](#), and [Data Control Language \(DCL\)](#).

SQL buffer

The default buffer containing your most recently entered SQL command or PL/SQL block. SQL*Plus commands are not stored in the SQL buffer.

SQL command

See [SQL statement](#).

SQL script

A file containing SQL statements that you can run in SQL*Plus to perform database administration quickly and easily.

SQL statement

A complete command or statement written in the SQL language. Synonymous with statement (SQL).

SQL*Loader

An Oracle tool used to load data from operating system files into Oracle database tables.

SQL*Net

Net8's precursor. An Oracle product that works with the Oracle Server and enables two or more computers that run the Oracle RDBMS or Oracle tools such as SQL*Forms to exchange data through a network. SQL*Net supports distributed processing and distributed database capability. SQL*Net runs over and interconnects many communications protocols.

SQL*Plus

An interactive SQL-based language for data manipulation, data definition and the definition of access rights for an Oracle database. Often used as an end-user reporting tool.

statement (SQL)

A SQL statement, and analogous to a complete sentence, as opposed to a phrase. Portions of SQL statements or commands are called expressions, predicates, or clauses. See also [SQL statement](#).

string

Any sequence of words or characters on a line.

substitution variable

In SQL*Plus, a variable name or numeral preceded by one or two ampersands (&). Substitution variables are used in a script to represent values to be provided when the script is run.

subtotal

In a report, a total of values in a number column, taken over a group of rows that have the same value in a break field. See also [summary](#).

summary

Summaries, or summary columns, are used to compute subtotals, grand totals, running totals, and other summarizations of the data in a report.

summary line

A line in a report containing totals, averages, maximums, or other computed values. You create summary lines through the BREAK and COMPUTE commands.

syntax

The orderly system by which commands, qualifiers, and parameters are combined to form valid command strings.

SYS username

See also [SYSTEM username](#).

SYSDBA

Privilege that contains all system privileges with the ADMIN OPTION and the SYSOPER system privilege. See also [SYSOPER](#).

SYSOPER

Privilege that allows a DBA to perform operations such as STARTUP, SHUTDOWN, ARCHIVE LOG and RECOVER. See also [SYSDBA](#).

system administrator

A person responsible for operation and maintenance of the operating system of a computer.

system editor

The text editor provided by the operating system.

System Global Area (SGA)

A shared storage area that contains information required by user processes and background processes, such as data and control information for one Oracle instance.

The SGA is allocated when an Oracle instance is started, and is deallocated when the instance shuts down.

SYSTEM username

One of two standard DBA usernames automatically created with each database (the other is SYS). The Oracle user SYSTEM is created with the password MANAGER. The SYSTEM username is the preferred username for DBAs to use when performing database maintenance.

system variable

A variable that indicates status or environment, which is given a default value by Oracle or SQL*Plus. Examples are LINESIZE and PAGESIZE. Use the SQL*Plus commands SHOW and SET to see and alter the value of system variables.

table

The basic unit of storage in a relational database management system. A table represents entities and relationships, and consists of one or more units of information (rows), each of which contains the same kinds of values (columns). Each column is given a column name, a datatype (such as CHAR, NCHAR, VARCHAR2, NVARCHAR2, DATE, or NUMBER), and a width (the width may be predetermined by the datatype, as in DATE). Once a table is created, valid rows of data can be inserted into it. Table information can then be queried, deleted, or updated. To enforce defined business rules on a table's data, integrity constraints and triggers can also be defined for a table.

table alias

A temporary substitute name for a table, defined in a query and only good during that query. If used, an alias is set in the FROM clause of a SELECT statement and may appear in the SELECT list. See also [alias](#).

text editor

A program run under your host computer's operating system that you use to create and edit host system files and SQL*Plus scripts containing SQL commands, SQL*Plus commands, and/or PL/SQL blocks.

timer

An internal storage area created by the TIMING command.

title

One or more lines that appears at the top or bottom of each report page. You establish and format titles through the TTITLE and BTITLE commands.

transaction

A logical unit of work that comprises one or more SQL statements executed by a single user. According to the ANSI/ISO SQL standard, with which Oracle is compatible, a transaction begins with the user's first executable SQL statement. A transaction ends when it is explicitly committed or rolled back by the user.

truncate

To discard or lose one or more characters from the beginning or end of a value, whether intentionally or unintentionally.

type

A column contains information in one of four types: character, date, number or long. The operations users can perform on the contents of a column depend on the type of information it contains. See also [format](#).

USERID

A command-line argument that allows you to specify your Oracle username and password with an optional Oracle Net address.

username

The name by which a user is known to the Oracle database server and to other users. Every username is associated with a private password, and both must be entered to connect to an Oracle database. See also [account](#).

user variable

A variable defined and set by you explicitly with the DEFINE command or implicitly with an argument to the START command.

VARCHAR

An Oracle Corporation datatype. Specifically, this datatype functions identically to the Oracle VARCHAR2 datatype (see definition below). However, Oracle Corporation recommends that you use VARCHAR2 instead of VARCHAR because Oracle Corporation may change the functionality of VARCHAR in the future.

VARCHAR2

An Oracle Corporation datatype. Specifically, it is a variable-length, alpha-numeric string with a maximum length of 4000 bytes. If data entered for a column of type VARCHAR2 is less than 4000 bytes, no spaces will be padded; the data is stored with a length as entered. If data entered is more than 4000 bytes, an error occurs. For more information about the VARCHAR2 datatype, refer to the *Oracle9i SQL Reference*.

variable

A named object that holds a single value. SQL*Plus uses bind substitution, system, and user variables.

view

A view can be thought of as a "stored query" presenting data from one or many tables. A view does not actually contain or store data, but derives data from the base tables on which it is based. Views can be queried, updated, inserted into, and deleted from. Operations on a view affect the view's base tables.

width

The width of a column, parameter, or layout object. Width is measured in characters; a space is a character.

wrapping

A reporting or output feature in which a portion of text is moved to a new line when the entire text does not fit on one line.

XMLType datatype

A standard Oracle datatype. The XMLType datatype is used to store XML documents which can be operated on, and can be selected like other Oracle datatypes. An XMLType can store up to 2 gigabytes of XML data.

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