

Oracle SQL*PLUS

(For 60-415, Fall 2006)

Prepared by: Mr. Nkulu Nkasa

1.1 Using SSH Secure Shell 3.2.9 to login to CS Systems

1. Launch the ssh secure shell
2. Click on Quick Connect
3. Enter Host Name eg: luna.cs.uwindsor.ca
4. Enter User Name eg: nkulu
5. Port Number: 22 (default)
6. Authentication Method: <profile Setting> (default)
7. Then press ENTER
8. Enter Password eg: XXXXXX

When connected to the computer science system luna.cs.uwindsor.ca or sol.cs.uwindsor.ca you can use SQL*PLUS Oracle's interactive Interface to the database server. SQL statements can be issued at the SQL> prompt and file containing SQL statements can be executed from within SQL*PLUS.

2.1 Oracle SQL*PLUS

Oracle's SQL*PLUS program provides a convenient interactive environment with the Oracle Database Server. The user may type the commands directly at the SQL> prompt or have SQL*PLUS execute commands residing in operating system files.

Entering and Exiting Oracle SQL*PLUS

To enter the SQL*PLUS environment, the sqlplus program should be executed in one of the following two ways, where

<user id> is the oracle user identification and

<password> is the associated password:

- sqlplus <userid>@<connection string>
- sqlplus

Figure 2.1

```
SSH Secure Shell 3.2.9 (Build 283)
Copyright (c) 2000-2003 SSH Communications Security Corp - http://www.ssh.com/

This copy of SSH Secure Shell is a non-commercial version.
This version does not include PKI and PKCS #11 functionality.

Last login: Sun Nov  6 14:28:22 2005 from lcust147.tnt9.d
Welcome to the School of Computer Science at the University of Windsor
luna system. This system delivers a Unix-based programming and development
environment to over one thousand faculty, students and staff to support
teaching and research activities.


Please use the sol.cs.uwindsor.ca system for general desktop and
document processing applications.

Sun Microsystems Inc.   SunOS 5.9           Generic May 2002
You have mail.
luna:~>sqlplus cezeife@cs01

SQL*Plus: Release 9.0.1.0.0 - Production on Sun Nov 6 14:30:53 2005

(c) Copyright 2001 Oracle Corporation.  All rights reserved.

Enter password: █
```

The screenshot shows a Windows XP desktop environment. The top portion is a terminal window displaying the output of an SSH connection and the SQL*Plus prompt. The bottom portion shows the Windows taskbar with the Start button and several open applications: Juno - Value-p..., Juno, luna.cs.uwin..., untitled - Paint, and oracle_doc_pr... The system tray on the right indicates an SSH2 connection with aes128-cbc encryption.

The Oracle **userid** and **password** are different from the **userid** and **password** to get access to the operating system (luna.cs.uwindsor.ca/sol.cs.uwindsor.ca)

If the **sqlplus** program is invoked with only **<userid>**, the program prompts the user for the password; if it is invoked without any parameters, the program prompts for the **<userid>** and **<password>**

To Exit the SQL*PLUS environment, the **exit** or **quit** command must be entered at the SQL> prompt.

SQL> quit

Executing Commands in SQL*PLUS

Once the user is within the SQL*PLUS environment, the system will usually display the prompt SQL> and wait for the user commands. The user may enter three kinds of commands:

- SQL statements, to access the database

- PL/SQL blocks, also to access the database
- SQL*PLUS commands, for editing and storing SQL statements and PL/SQL blocks, setting options, and formatting query results.

SQL statements can be entered at the SQL> prompt. A statement may be broken into multiple lines. SQL*PLUS displays a line number (starting at 2) after the user presses the RETURN key to go to the next line. The SQL statement may be terminated in one of the three ways:

- With a semicolon (;), indicating to SQL*PLUS that it should execute the statement immediately.
- With a slash (/) on a line by itself, also indicating to SQL*PLUS that it should execute the statement immediately.
- With a blank line, indicating to SQL*PLUS that it should not do anything with the statement. The statement is stored in a buffer and can be executed at a later stage

The following is a screen capture of an SQL statement executed in SQL*PLUS from the **CEZEIFE ACCOUNT**

SQL Statement:

```
SQL> select course_no AS course#, c_title "course title", c_credit " course credit"
  2  from uw_courses;
```

Figure 2.2

```
SQL> select course_no AS course#, c_title "course title", c_credit " course credit"
2 from uw_courses;
```

COURSE#	course title	course credit
360100	Key Concepts in Computer Science	3
360104	Computer Concepts for End-Users	3
360106	Programming in C for Beginners	3
360140	Introduction to Algorithms and Programming I	3
360141	Introduction to Algorithms and Programming II	3
360205	Introduction to the Internet	3
360207	Problem Solving and Information on the Internet	3
360212	Object-Oriented Programming using Java	3
360214	Computer Languages- Grammars and Translators	3
360231	Theoretical Foundations of Computer Science	3
360254	Data Structures and Algorithms	3
<hr/>		
COURSE#	course title	course credit
360256	Systems Programming	3
360265	Computer Architecture I: Digital Design	3
360266	Computer Architecture II: Microprocessor Programming	3
360270	Advanced Website Design- Construction and Deployment	3
360275	Selected Topics I	3
360280	Practicum I	3
360298	Co-op Work Term I	3
360305	Cyber-Ethics	3
360311	Introduction to Software Engineering	3
360315	Database Management Systems	3
360322	Object-Oriented Software Analysis and Design	3
<hr/>		
COURSE#	course title	course credit
360330	Operating Systems Fundamentals	3
360334	World-Wide Web Information Systems Development	3
360336	World-Wide Web Site Design and Development	3
360342	End-user Interface Programming	3
360350	Introduction to Multimedia Systems	3
360352	Introduction to Computer Graphics	3

Connected to luna.cs.uwindsor.ca SSH2 - aes128-cbc

Start | Juno - Value-priced... | Juno | untitled - Paint | oracle_doc_prep - ... | luna.cs.uwindsor... | Juno Speed... SpeedBand On

Figure 2.3

```

COURSE# course title                                     course credit
-----
360256 Systems Programming                               3
360265 Computer Architecture I: Digital Design          3
360266 Computer Architecture II: Microprocessor Programming 3
360270 Advanced Website Design- Construction and Deployment 3
360275 Selected Topics I                                3
360280 Practicum I                                       3
360298 Co-op Work Term I                                3
360305 Cyber-Ethics                                      3
360311 Introduction to Software Engineering              3
360315 Database Management Systems                       3
360322 Object-Oriented Software Analysis and Design      3

COURSE# course title                                     course credit
-----
360330 Operating Systems Fundamentals                    3
360334 World-Wide Web Information Systems Development     3
360336 World-Wide Web Site Design and Development        3
360342 End-user Interface Programming                    3
360350 Introduction to Multimedia Systems                 3
360352 Introduction to Computer Graphics                 3
360354 Theory of Computation                             3
360367 Computer Networks                                 3
360375 Selected Topics II                                3
360393 Developing Systems for Information Processing      3
360398 Co-op Work Term II                                3

COURSE# course title                                     course credit
-----
360411 Software Verification and Testing                 3
360436 Distributed Computing                             3
360440 Principles of Programming Languages               3
360450 Multimedia System Development                    3
360454 Design and Analysis of Computer Algorithms        3
360460 Digital Design and Computer Architecture          3

39 rows selected.
SQL>

```

You can also enter PL/SQL anonymous blocks at the SQL> prompt for execution and issue statements such as **create function** and **create procedure** at the SQL> prompt to create PL/SQL stored objects.

Eg: SQL Statement

```

/*
**This is a PL/SQL anonymous block
*/
DECLARE
    v_date DATE; -- variable v_date that will store the today date

BEGIN
    -- get the date from the system date and store it into the v_date
    SELECT SYSDATE
    INTO v_date
    FROM DUAL;

    -- print the today's date on the screen
    DBMS_OUTPUT.PUT_LINE('Today's date is '|| v_date );
END;
/

```

Figure 2.4

```

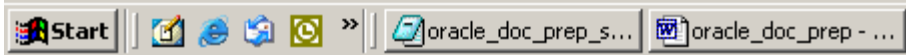
SQL> run
 1 DECLARE
 2
 3   v_date DATE;
 4
 5 BEGIN
 6
 7   SELECT SYSDATE
 8   INTO v_date
 9   FROM DUAL;
10
11   DBMS_OUTPUT.PUT_LINE('Today''s date is '|| v_date );
12
13* END;
Today's date is 06-NOV-05

PL/SQL procedure successfully completed.

SQL>

```

Connected to luna.cs.uwindsor.ca



The above PL/SQL anonymous block is executed by typing the “run” command at the SQL> prompt.

Besides SQL and PL/SQL, users can also enter SQL*PLUS commands at the SQL> prompt. These commands can manipulate SQL commands and PL/SQL blocks, format and print query results, and set various options for SQL*PLUS. SQL*PLUS must be entered in one line. If the command is long, it may be continued to the next line by typing the hyphen symbol (-) at the end of the line before pressing the RETURN key. Here is an example of an SQL*PLUS command that formats a column of the SQL query.

SQL Statement

```

SQL> select course_no AS course#, c_title "course title", c_credit " course credit"
 2   from uw_courses;

```

```

SQL> column c_credit format -

```

```

    > 99.99 heading "Course Credit"

```

```

SQL> run

```

```

 1 select course_no, c_title, c_credit
 2 from uw_courses

```

Figure 2.5

```
SQL> column c_credit format -
> 99.99 heading "Course Credit"
SQL> run
1 select course_no, c_title, c_credit
2* from uw_courses
```

COURSE_NO	C_TITLE	Course Credit
360100	Key Concepts in Computer Science	3.00
360104	Computer Concepts for End-Users	3.00
360106	Programming in C for Beginners	3.00
360140	Introduction to Algorithms and Programming I	3.00
360141	Introduction to Algorithms and Programming II	3.00
360205	Introduction to the Internet	3.00
360207	Problem Solving and Information on the Internet	3.00
360212	Object-Oriented Programming using Java	3.00
360214	Computer Languages- Grammars and Translators	3.00
360231	Theoretical Foundations of Computer Science	3.00
360254	Data Structures and Algorithms	3.00

COURSE_NO	C_TITLE	Course Credit
360256	Systems Programming	3.00
360265	Computer Architecture I: Digital Design	3.00
360266	Computer Architecture II: Microprocessor Programming	3.00
360270	Advanced Website Design- Construction and Deployment	3.00
360275	Selected Topics I	3.00
360280	Practicum I	3.00
360298	Co-op Work Term I	3.00
360305	Cyber-Ethics	3.00
360311	Introduction to Software Engineering	3.00
360315	Database Management Systems	3.00
360322	Object-Oriented Software Analysis and Design	3.00

The **column** command formats a particular column in the current query (in this case the column is formatted and given a different name for display purposes). SQL*PLUS commands need not be terminated with semicolon

The following are a few of the more commonly used SQL*PLUS commands

- **describe [desc]** List the column definitions for a database table. The following is an example of the **describe** command

Figure 2.6

```
SQL> desc uw_courses
```

Name	Null?	Type
COURSE_NO	NOT NULL	NUMBER(7)
C_TITLE	NOT NULL	VARCHAR2(100)
C_CREDIT	NOT NULL	NUMBER(1)


```
SQL> describe uw_courses
```

Name	Null?	Type
COURSE_NO	NOT NULL	NUMBER(7)
C_TITLE	NOT NULL	VARCHAR2(100)
C_CREDIT	NOT NULL	NUMBER(1)

```
SQL> 
```

Connected to luna.cs.uwindsor.ca

SSH2 - aes128-cbc

Figure 2.7

```
SQL> help column

COLUMN
-----

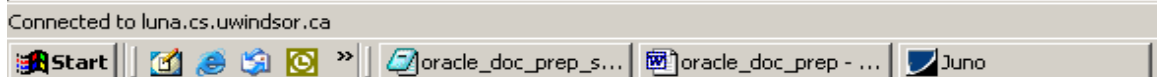
Specifies display attributes for a given column, such as:
  - column heading text
  - column heading alignment
  - NUMBER data format
  - column data wrapping

Also lists the current display attributes for a single column
or all columns.

COL[UMN] [{column | expr} [option...]]

where option is one of the following clauses:
  ALI[AS] alias
  CLE[AR]
  FOLD_A[FTER]
  FOLD_B[EFORE]
  FOR[MAT] format
  HEA[DING] text
  JUS[TIFY] {L[EFT] | C[ENTER] | C[ENTRE] | R[IGHT]}
  LIKE {expr | alias}
  NEWL[INE]
  NEW_V[ALUE] variable
  NOPRI[NT] | PRI[NT]
  NUL[L] text
  OLD_V[ALUE] variable
  ON|OFF
  WRA[PPED] | WOR[D_WRAPPED] | TRU[NCATED]

SQL> 
```



- **execute.** Execute a single PL/SQL statement. The syntax is

SQL> execute statement

- **help.** Gets online help for SQL*PLUS commands. For example,

SQL> help column

Will list the description of the column command. To get a list of all commands use the following command:

SQL> help <command name>

- **host.** Execute a host operating system command without leaving SQL*PLUS. For example,

```
SQL> host ls *.sql
```

Will list all the files in the current directory with a .sql extension. The exclamation key (!) may be used instead of the host command to achieve the same effect.

Figure 2.7

```
SQL> help host

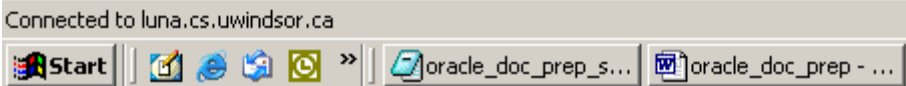
HOST
----

Executes a host operating system command without leaving
SQL*Plus.

HO[ST] [command]

SQL> host ls *.sql
wsproject.sql

SQL>
```



- **remark.** Used for comments. Any line beginning with keyword remark or **rem** or two hyphens (--) is treated as a comment and is ignored by SQL*PLUS.
- **Run.** Executes the SQL statement present in the buffer. The run command works the same as the slash command, except that it also displays the buffer contents before executing the statement in the buffer.
- **Set.** Sets SQL*PLUS system variables. Some of the more useful system variables include

```
SQL> set pause on;
SQL> set autoCommit on;
SQL> set echo on;
```

Setting **pause** to **on** causes SQL*PLUS to pause at the beginning of each page. The user must press RETURN key to see the next page.

Setting **autoCommit** to **on** informs Oracle to commit any changes to the database immediately after the SQL statement that has caused the changes, is executed.

Setting **echo** to **on** causes SQL*PLUS to list each commands in a file when the file is run with the start command. The names of other system variables, along with explanations, can be obtained by using **help** on the **set** command.

Figure 2.8

```
SQL> help spool

SPOOL
-----

Stores query results in an operating system file, or sends the
file to a printer.

SPO[OL] [file_name[.ext] | OFF | OUT]

SQL> help start

START
-----

Executes the contents of a command file.

STA[RT] file_name[.ext] [arg ...]

STARTUP
-----

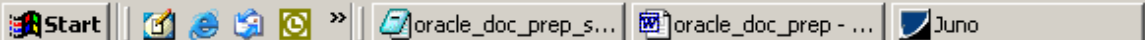
Starts an Oracle instance with several options, including mounting,
and opening a database.

STARTUP [FORCE] [RESTRICT] [PFILE=filename] [EXCLUSIVE]
        [PARALLEL [RETRY]] [SHARED [RETRY]]
        [MOUNT [dbname] | OPEN [open_options] [dbname] | NOMOUNT]

where open_options has the following syntax:
        READ {ONLY|WRITE [RECOVER]} | RECOVER

SQL> 
```

Connected to luna.cs.uwindsor.ca



3.1 Buffer Manipulation Commands

The most recent command that is entered on the SQL prompt is stored in the SQL*PLUS buffer. It is possible to access, change, append to, and save the contents of the buffer. The SQL*PLUS buffer editing commands are listed below. All the editing commands (except for the list command) affect only one line, the current line. To make a particular line the current line, simply list that line by typing the line number the following SQL*PLUS session illustrates some of the editing commands.

Figure 3.1

```

SQL> desc uw_courses
Name                                         Null?    Type
-----
COURSE_NO                                   NOT NULL NUMBER(7)
C_TITLE                                    NOT NULL VARCHAR2(100)
C_CREDIT                                   NOT NULL NUMBER(1)

SQL> select course_no, c_title
       2  from courses;
from courses
       *
ERROR at line 2:
ORA-00942: table or view does not exist

SQL> 2
       2* from courses
SQL> change /courses/uw_courses/
       2* from uw_courses
SQL> list
       1  select course_no, c_title
       2* from uw_courses
SQL> /

COURSE_NO
-----
C_TITLE
-----
       360100
Key Concepts in Computer Science

       360104
Computer Concepts for End-Users

       360106
Programming in C for Beginners

COURSE_NO
-----

```

Figure 3.2

```
SQL> select course_no, c_titl
      2  from uw_courses;
select course_no, c_titl
      *
```

```
ERROR at line 1:
ORA-00904: invalid column name
```

```
SQL> 1
      1* select course_no, c_titl
SQL> change /tl/tle/
      1* select course_no, c_title
SQL> list
      1  select course_no, c_title
      2* from uw_courses
SQL> /
```

```
COURSE_NO C_TITLE
```

```
-----
360100 Key Concepts in Computer Science
360104 Computer Concepts for End-Users
360106 Programming in C for Beginners
360140 Introduction to Algorithms and Programming I
360141 Introduction to Algorithms and Programming II
360205 Introduction to the Internet
360207 Problem Solving and Information on the Internet
360212 Object-Oriented Programming using Java
360214 Computer Languages- Grammars and Translators
360231 Theoretical Foundations of Computer Science
360254 Data Structures and Algorithms
```

```
COURSE_NO C_TITLE
```

```
-----
360256 Systems Programming
360265 Computer Architecture I: Digital Design
360266 Computer Architecture II: Microprocessor Programming
360270 Advanced Website Design- Construction and Deployment
360275 Selected Topics I
360280 Practicum I
360298 Co-op Work Term I
```

Table 3.1 SQL*PLUS buffer editing commands.

Command	Abbreviation	Explanation
Append <i>text</i>	A <i>text</i>	Add text to the end of a line
Change <i>/old/new</i>	C <i>/old/new</i>	Change old to new in a line
Change <i>/text</i>	C <i>/text</i>	Delete text from a line
Clear buffer	C buff	Delete all lines
Del		Delete a line
Get file		Load contents of file named file into buffer
Input	I	Add one or more lines
Input <i>text</i>	I <i>text</i>	Add a line consisting of text
List	L	List all lines in buffer
List n	L n or n	List one line and make it the current line
List *	L *	List the current line
List last	L last	List the last line
List m n	L m n	List lines m through n
Save file	Sav file	Save contents of buffer to file named file.