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

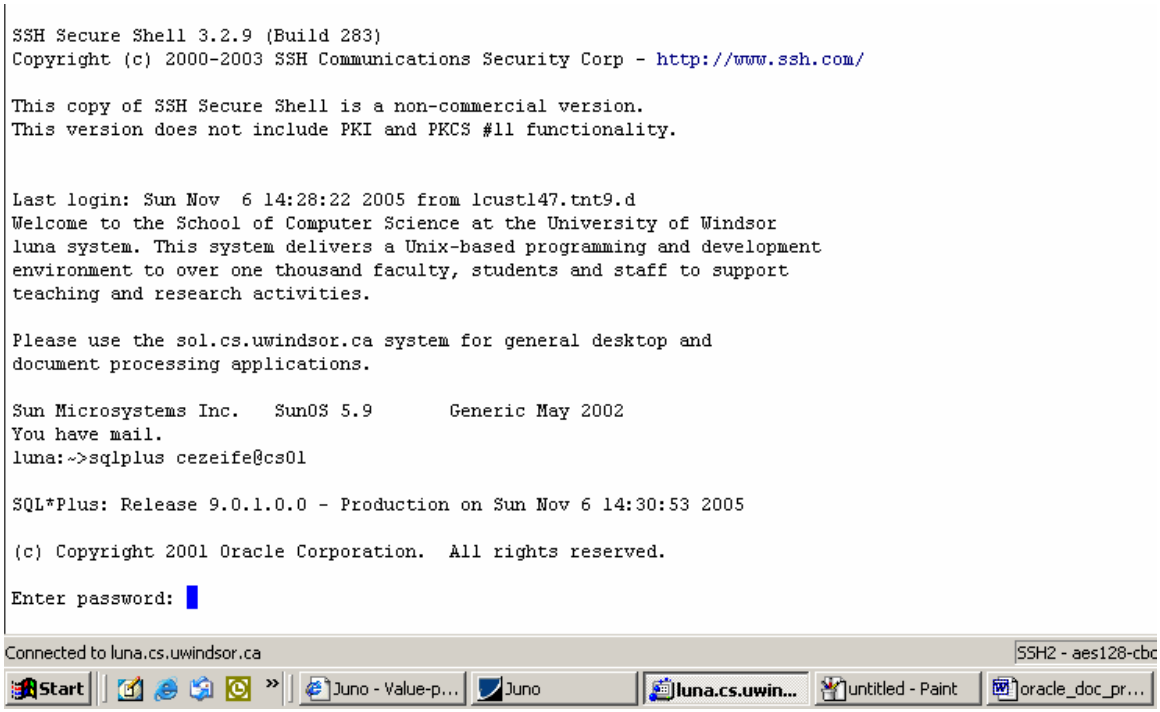
Oracle's SQL*PLUS program provides a convenient interactive environment with the Oracle Database Server. The user may type the commands directly at the SQL> prompt or have SQL*PLUS execute commands residing in operating system files.

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



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

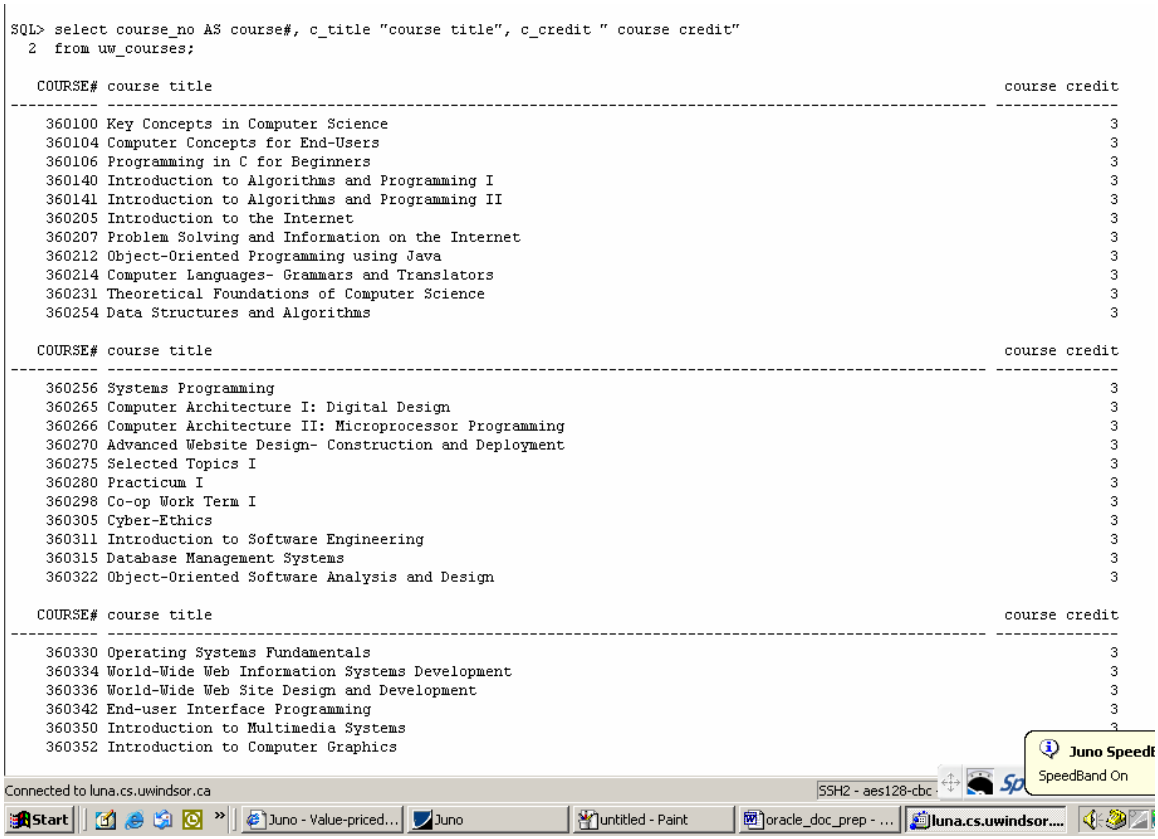

SQL> select course_no AS course#, c_title "course title", c_credit " course credit"
2 from uw_courses;
COURSE# course title course credit
360100 Key Concepts in Computer Science 3
360104 Computer Concepts for End-Users 3
360106 Programming in C for Beginners 3
360140 Introduction to Algorithms and Programming 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
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
360352 Introduction to Computer Graphics
Juno SpeedB
SpeedBand On
Connected to luna.cs.uwindsor.ca
SSH2 - aes128-cbc
Start
Juno - Value-priced...
Juno
untitled - Paint
oracle_doc_prep - ...
luna.cs.uwindsor....

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.

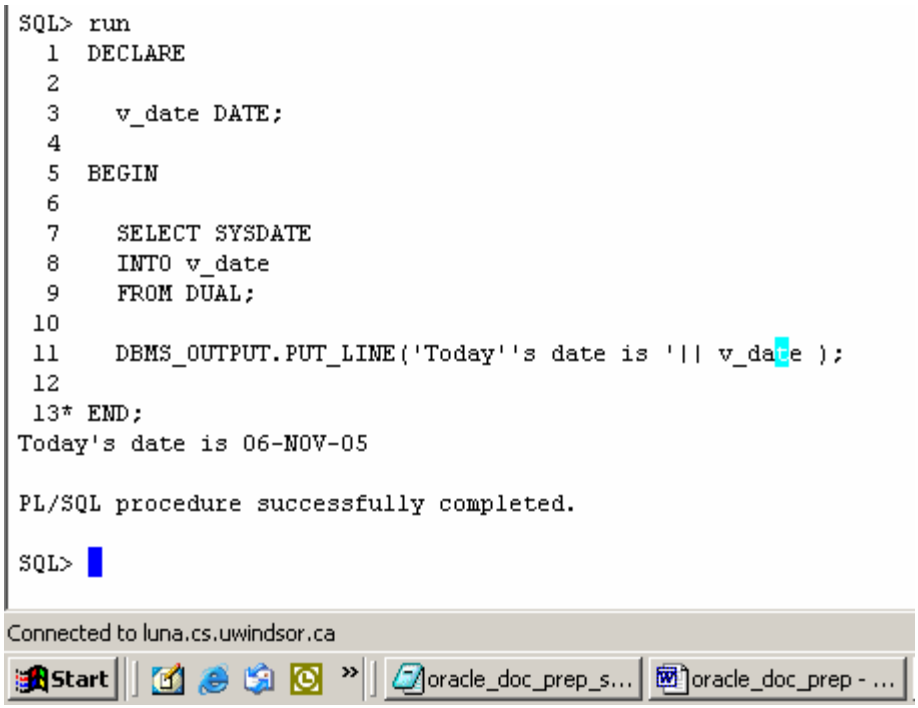
Eg: SQL Statement

```
/*
**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



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

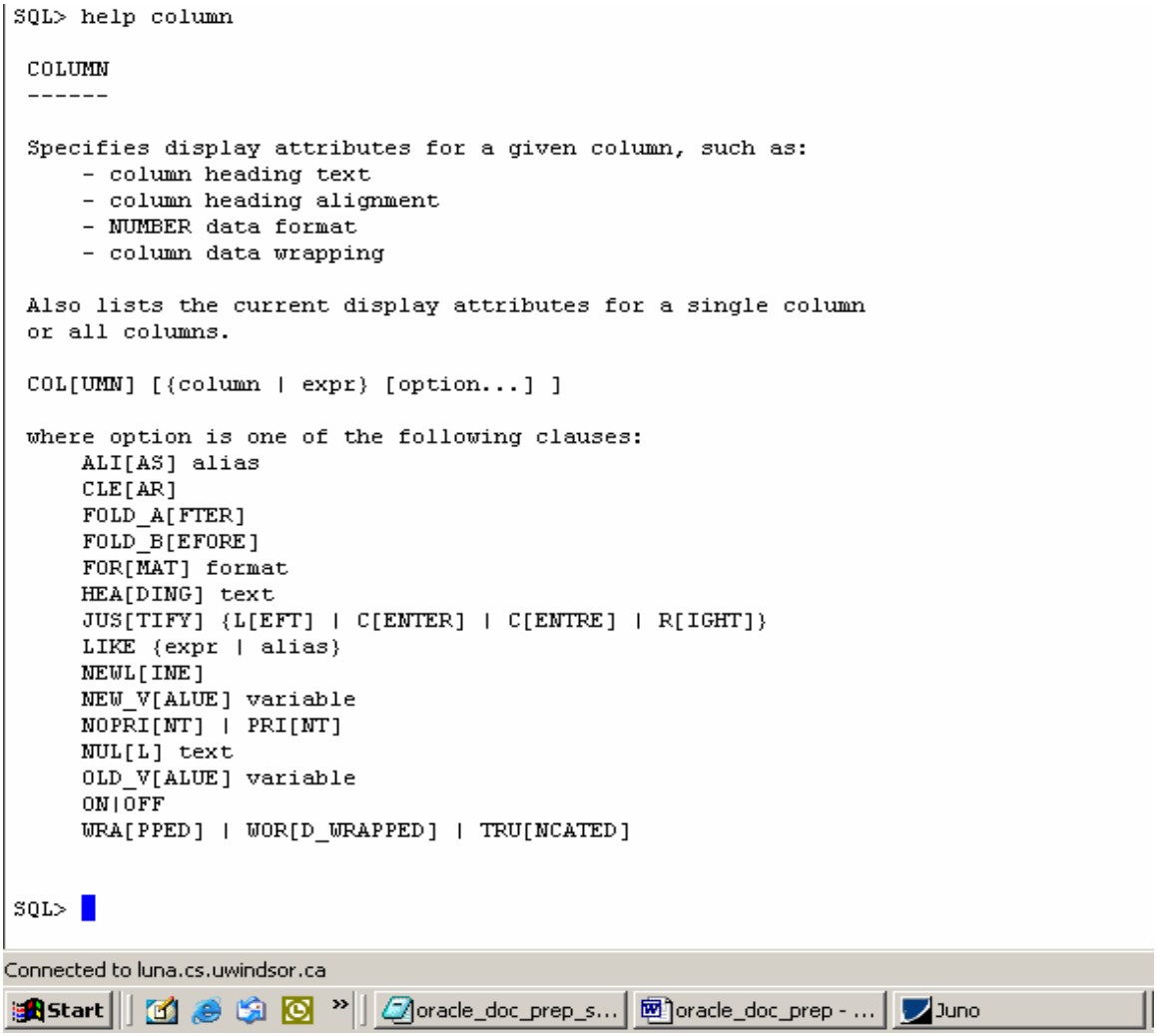
Figure 2.6

```
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



- **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:

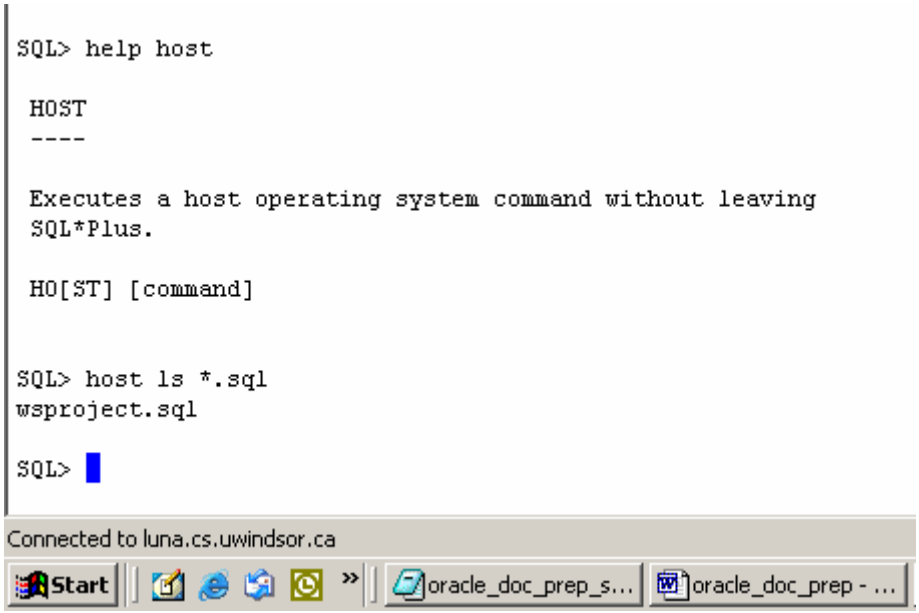
  SQL> help <command name>

- **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



- **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

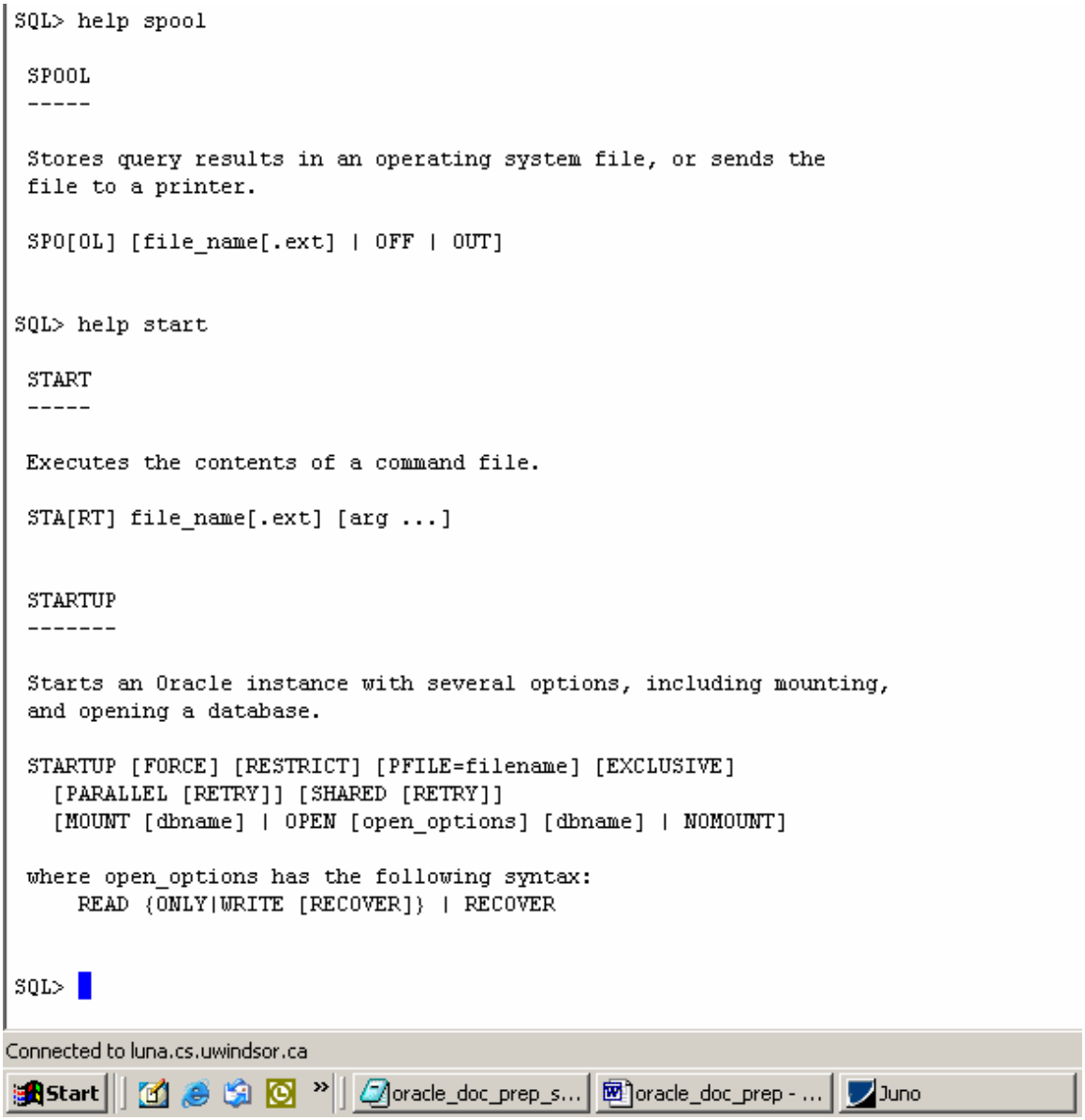
  SQL> set pause on;
  SQL> set autoCommit on;
  SQL> set echo on;

  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



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> l
  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 *text*	**A** *text*	Add text to the end of a line
Change */old/new*	**C** */old/new*	Change old to new in a line
Change */text*	**C** /text	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 *text*	**I** *text*	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.