

## COSC344 Lab for Week 2

### Overview

The purpose of this lab is to get you familiar with Oracle and its use in our environment. Even though the material is not very challenging, please do the lab because it will prepare you for the subsequent labs as well as the assignments. Cathy is available in this lab to resolve any system related problems.

**OS requirement:** The computer **MUST** be running **Linux** for this course.

**Important Note:** Please read each bold headed section **completely** before doing anything in that section. You may encounter problems if you do not strictly follow the given instructions.

### One Time Setup

The following process will set up your environment so that you can access Oracle from a lab computer. It sets up some environmental variables, and also a command alias.

You need to do this **ONCE ONLY** before you can use Oracle.

Type the following exactly as written, or cut & paste the commands from the web page <http://www.cs.otago.ac.nz/cosc344/OneTimeSetUp.php>

```
cp -p ~/.bashrc ~/.bashrc-saved
cat /coursework/344/pickup/bashrc >> ~/.bashrc
source ~/.bashrc
```

The first command saves a copy of the environment setup file. Since setup files are fragile things, you may not be able to log in if you edit yours and make a mistake. That is why we save a copy before altering it.

If you are interested in the environment setup for Oracle, you can read the command lines in the `bashrc` file in the `/coursework/344/pickup/` folder.

### Starting Oracle

Type `rlsql` to start an Oracle client. ("`rlsql`" is a command alias set up for you in the One Time Setup process - it is the equivalent of typing "`rlwrap sqlplus`" on the command line.) Oracle will prompt for your username and password. Your username is the same as your Linux username. Your password is initially set to `cs` followed by your student ID number. You will change your Oracle password soon. You should have the following prompt:

```
sql>
```

**A reminder:** You have multiple username-password combinations. One allows you to log onto the Linux machines. You also have an Oracle username and password for this course. Your username is common across all the lab machines. Your password is the same on the

various machines. I refer to that password as your *machine password* in this document. You also have a password for the Oracle database management system. I refer to it as your *Oracle password*. For security reasons, you should use a different Oracle password from your machine password.

**[Caution]:** Oracle often lets you provide your Oracle username and password on the same line as a parameter to a command. Please resist doing so since the information can be seen by anyone doing a *ps* command. Let Oracle prompt you for the username and password; it is much safer.

## Changing Your Oracle Password

The password must start with a letter - subsequent characters may be letters, numbers, or the symbols # (pound sign), \$ (dollar sign) or \_ (underscore).

**Important:** read the caution below before using the following command to change password.

To change your Oracle password, type:

```
ALTER USER username IDENTIFIED BY new_password;
```

**[Caution]:**

1. Remember to put the semicolon immediately after the new password. Don't forget it!!
2. Oracle does not ask for a confirmation so type carefully and note what you type.

## To Exit Oracle

To quit Oracle, type `quit` or `exit`.

## Entering Oracle Commands

At the SQL prompt, type the following:

```
SELECT table_name FROM all_tables;
```

This will give a long list of tables including many which are owned by the system accounts and are not really of any interest. To see a more manageable list type

```
SELECT table_name FROM all_tables WHERE owner NOT LIKE '%SYS%';
```

This will show fewer tables, including some tables owned by SCOTT.

These tables must be accessed as `owner.table_name`  
i.e. `select * from scott.emp;`

SQL is not case sensitive. The only situation where character case matters is when you enter text strings or make comparisons between text strings.

In general, we will suggest to use uppercase characters for SQL keywords and lowercase for everything else. However, you can type in whatever case you wish.

In SQL, a semicolon (;) terminates a command. Pressing <return> takes you to a new line, but does not execute a command. This allows you to format long commands in a sensible manner. If you accidentally press <return> when you wanted to execute a command, simply enter a semicolon and a <return>.

## A Suggested Terminal and Application Setup

For many of our labs and your work, you will find it convenient to have two terminal windows open. You can use one of the windows for interactive work in Linux and use the other window to stay in SQL. This saves having to constantly type in your Oracle username and password.

**[Important]** you need to make sure both terminals are set to the same working directory.

## Create a Directory To Work In

Create a directory to do your lab work in. You may want to create a directory in your home directory for all COSC 344 work, and then create subdirectories under it for each of the labs. Remember that you will also have assignments to work on in the near future.

If you created a (sub) directory, then **cd** your terminal window(s) to it before continuing.

## Executing SQL Statements in a File

Oracle will allow you to put SQL commands into a file and then execute them.

Bring up your favorite editor and create a file with the following:

```
DROP TABLE x;

CREATE TABLE x
  ( i INT,
    r NUMBER(6,2) );

INSERT INTO x VALUES (1, 1.1);
INSERT INTO x VALUES (2, 2.2);
INSERT INTO x VALUES (3, 3.3);

COMMIT;

SELECT * FROM x;
```

Save the file as `test.sql`

Now at the `sql>` prompt, type `@test.sql`

Note that you **must** start the Oracle client from the directory in which you save the `test.sql` file. For example, if you save `test.sql` in the `cosc344/lab1` directory, you need to change (using the **cd** command) to that directory first and then type `rlsql` to start the Oracle client; otherwise Oracle will not be able to find the `test.sql` file.

Your SQL commands will be executed. You may get an error message from the first command. The reason is that there most likely is not a table called *x* in the database. If you execute the script again, you will not see an error.

When executing from a script, Oracle will attempt all commands in spite of errors. That is, it does not stop at an error.

You will find scripts a convenient way to load data into Oracle and to restore your tables to a known state. To create a table and load it, the usual sequence is *drop table*, *create table*, followed by a series of *insert into* commands. Oracle automatically commits a script, but it is best to commit after you finish inserting into a table. More on that later.

### Getting Information About Your Database

Oracle keeps meta-data about your database in some system tables. A handy table is called USER\_TABLES, which tracks the tables in your database. You can get the names of your tables by typing:

```
SELECT table_name FROM user_tables;
```

You should see at least table *x* is listed. This command is handy if you forget what you called your tables later on.

To get information about a particular table, you can use the DESCRIBE command. Try typing:

```
DESCRIBE x;
```

This command is handy if you forget the attributes and their types.

### Recording an Oracle Session

When you connect to Oracle, an Oracle session starts. You can use the SQL `spool` command to record an Oracle session into a file.

To use the SQL `spool` command, type `spool filename;` at the `sql>` prompt. A file with an extension `.lst` is created and all further SQL commands and responses are recorded into the file. To stop recording, type `spool off;` Recording also stops if you exit from SQL.

### Accessing Oracle Help

Oracle documentation is available online and can be read with a web browser. (This is only available from on-campus for legal reasons.)

Bring up a web browser on your lab computer and open the course web page, <http://www.cs.otago.ac.nz/cosc344>. You may wish to bookmark this page. Under *Resources*, you will see *Oracle12 Documentation Library*. This takes you to the Oracle online documentation.

For this lab, find and briefly look at the documentation for the following:

Click on [SQL Language Reference](#) (HTML).

Look through the table of contents

Look at:

[Datatypes](#)

[AVG function](#)

[CREATE TABLE command](#)

## **Clean Up**

Before you quit this lab, type `drop table x;` at the `sql>` prompt. That gets rid of the table we experimented with -- just a little housekeeping.

## **Practice Dia**

Dia is a software that can help you draw the ER diagram. To run the software, open a terminal and type `dia` and return.

There are three videos in the following folder:

`/home/cshome/coursework/344/pickup/00-ERD_videos`

You can watch these three videos and learn how to create an ERD for a miniworld.

## **Assessment**

There is no assessment for this lab.