**CSC460/560 – Database Systems**

**Oracle Express 11g – Lab**

This lab covers all the topics that were presented in today’s Oracle presentation. With this lab you will get an introduction on how to use Oracle Express 11g to create tables, perform queries, and use of the Explain and Autotrace functions of Oracle.

**Step 1: Downloading and Installing Oracle Express 11g**

This step provides you with instructions on how to download Oracle on your computer. Oracle has already been installed on the Carnegie lab computers so skip this step and go over it at your convince.

1. **Downloading Oracle:**

Go to <http://www.oracle.com/technetwork/database/enterprise-edition/downloads/index.html> and click on the Downloads link to download the version of Oracle Express you wish. We recommend version 11 and above. (You can download to install the version 12g, but for the purpose of this class we will use version 11g).

1. **Installation:**

Oracle installation can be quite confusing. To help you get started the following are useful links to get you started with the installation process.

Documentation and installation information can be found here:

<http://download.oracle.com/docs/cd/E17781_01/index.htm>

This YouTube video is a good tutorial on installing Oracle on your machine <http://youtu.be/0NLsJQCvKXY>

**Step 2: Getting started**

Once Oracle has been successfully installed, it can be located under your computer programs menu.

* Click on windows button, then navigate to the Programs/All Programs menu option, look for the Oracle Database 11g Express Edition, and then Run SQL Command Line.
* On the SQL Command Line, login with username SYSTEM or SYS and use for the password
* As explained in today’s presentation, SYSTEM or SYS is the default admin user for Oracle. If you wish to login as a different user, use the steps below. For the purpose of this presentation will be using SYSTEM or SYS.

**Create the user:**

SQL > create user <username> identified by <password>;

**Grant the user system privileges:**

SQL> grant connect, resource to <username>;

**Step 3: Creating Tables**

Oracle stores tables in what is known as tablespaces. Tablespaces store Oracle database objects such as tables, indexes and rollback segments. You can create your own tablespace by using the CREATE TABLESPACE statement. We won’t create any tablespaces for this lab, we will use SYSTEM tablespace which is the default. (For more information on how to create tablespaces view the online documentation)

Creating tables in Oracle is similar the syntax to creating tables with MySQL. The following is the syntax used in creating tables in Oracle.

CREATE TABLE *tbl\_name*

(*column\_name1 data\_type(size),*

*column\_name2 data\_type(size),*

*column\_name3 data\_type(size),*

*....*

*);*

Example

Creating a student’s table:

CREATE TABLE student(

id number not null,

snum int not null,

fname varchar(30) not null,

sname varchar(40) not null,

major char(3),

PRIMARY KEY (id)

) ;

Oracle supports a wide range of data types. For a full comprehensive list, visit <http://ss64.com/ora/syntax-datatypes.html>

Oracle supports also relational operator such as

|  |  |
| --- | --- |
| * < | is less than |
| * <= | is less than or equal to |
| * > | is greater than |
| * >= | is greater than or equal to |
| * == | is equal to |
| * != | not equal to |

Wild cards in Oracle are represented by **%** and **\_**

**Step 4: Inserting values into tables**

In order to add values into tables, we use the following syntax

INSERT INTO table\_name VALUES (column1 value, column2 value,...);

Example:

For our students table we would add values as follows:

INSERT INTO student VALUES(2, 2452, 'Joe', 'Jones', 'MTH');

**Step 4: Manipulating Tables in Oracle**

* **ALTER TABLE**: we use the ALTER TABLE syntax to add and delete columns in table.

**Adding columns**

Syntax:

ALTER TABLE table\_name ADD column1\_name column1\_datatype;

Example

Adding a sex column on our students table

ALTER TABLE student ADD sex varchar2(1) NOT NULL;

**Deleting columns**

Syntax:

ALTER TABLEtable\_name DROP columncol\_name1;

Example

Deleting the sex column on our students table

ALTER TABLE student DROP sex;

**Step 4: SQL Commands**

The following are some of the important SQL commands that are supported by Oracle (note that they are similar to what you have seen before).

* **SELECT** - extracts data from a database
* **UPDATE** - updates data in a database
* **DELETE** - deletes data from a database
* **INSERT INTO** - inserts new data into a database
* **CREATE DATABASE** - creates a new database
* **ALTER DATABASE** - modifies a database
* **CREATE TABLE** - creates a new table
* **ALTER TABLE** - modifies a table
* **DROP TABLE** - deletes a table
* **CREATE INDEX** - creates an index (search key)
* **DROP INDEX** - deletes an index

(From:[**http://www.w3schools.com/sql/sql\_syntax.asp**](http://www.w3schools.com/sql/sql_syntax.asp))

**Practice questions:**

Begin by downloading the students\_DB.txt file from blackboard and inserting them to the Oracle SQL Command Line (you can copy and paste the tables to save time). This is file contains the tables we will be using for our practice problem set.

You might need this commands:

* To clear screen: cl src
* To make everything appear on online: set wrap off
* Example of Creating views in Oracle:

create view facultycours as

select f.fid, fname, cname

from faculty f, course c

where f.fid = c.fid;

(Oracle supports almost all the query operations you have seen before so this should be fair game)

Your task for this practice questions is to write the following commands in SQL that can be run in oracle.

1. Show the first name of all students enrolled in a course.
2. Show the student id and first name for the student taking the most courses.
3. Create a view that performs a join between student and the enroll table. This view should only display the student’s id, course id and course name. Name your view “studentenroll”.
4. Show the student’s id, students name and major for all students in a computer science course. Write this using the 4 different join queries (Use the view you created).
5. For the queries above, perform an Autotrace to determine which query performs better than the rest and why. (take screenshots of your Autotrace)