CS 4611 – Spring 2017 – Laboratory 1
Assigned: 09/05/2017
Due: 09/05/2017 by the end of the lab. Submit your file(s) to canvas.

Objectives: After this lab you will learn the following:

- **How to use Oracle SQL Developer to interact with the Oracle DBMS.**
- **How to use the Oracle documentation to find information.**
- **How to use Oracle SQL to create tables, to add primary keys, to add foreign keys, and not-null and check constraints.**
- **How to use Oracle SQL to write simple SELECT queries like performing selection queries, projection queries, finding the Cartesian product of two sets, and doing joins.**
- **How to rename attributes in query result sets.**
- **How to remove duplicate rows from query result sets.**

Activity 1: Visit the website http://www.oracle.com/technetwork/developer-tools/sql-developer/downloads/index.html and download SQL Developer.

Activity 2: Use SQL Developer to connect to the Oracle server running in the machine akka.d.umn.edu. For your username use the first four letters of your last name followed by the first letter of your name. Example: "leale" would be my username. If your last name doesn't have more than four letters, then use your full last name followed by the first letter of your name.

Activity 3: Visit the course's website at canvas.umn.edu and download the document "Oracle 11g – SQL Language Reference.pdf". Here you will find additional information on the data types supported by Oracle (Hint for the date data type!).

Activity 4: Consider the following three tables:

employee

employee_name	birthdate	salary
Valjean	09/23/1956	$56K
Cosette	01/24/1997	$25K
Fantine	06/14/1985	$49K
Gabroche	04/9/2001	$10K

works_in_project

project_ID	employee_name	num_hr
12	Valjean	80
26	Valjean	23
12	Fantine	12
17	Cosette	6

is_supervised_by

name	supervisor_name
Cosette	Valjean
Fantine	Valjean
Gabroche	Cosette

Now, write a file names *hw1_yourname.sql* containing code to perform the following:

a) Create the three tables above in Oracle. The table definitions must define the necessary primary keys, foreign keys, *not-null constraints* and *check constraints* (I will explain these in the lab). The names of the attributes must be exactly as above, underscores included.
b) (Simple selection query) Retrieve the names of all employees. You must rename the names of the attributes of the query result set to 'Employee Name' (i.e. without the underscore).
c) (Selection query) Retrieve the names of all employees that work for at least 20 hours in any project. Your query result set must not have any duplicates.
d) (Projection query) Retrieve only the names and salaries of each employee.
e) (Cartesian Product) Retrieve the Cartesian product of the table employee and the table works_in_project.
f) (Join) Retrieve the names and salaries of employees supervised by either Fantine or Cosette.

BONUS: Add code to your *hw1_yourname.sql* to do the following:

- In one query, retrieve for every employee the average salary of the employees under his/her supervision. (HINT: Grouping and aggregation functions).