# COMP 3311: Database Management Systems

## Lab 5 Exercise: PL/SQL and Cursors

### HOW TO GET THE CREDIT FOR THIS LAB

1. **Download** the zipped folder Lab5Exercise.zip from the ***PL/SQL and Cursors*** entry of the Lab Schedule course webpage and **unzip** it. The folder contains the three script files Lab5.sql, Lab5CgaCalculations.sql and Lab5TestQueries.sql.
2. **Modify** your InsertMyself.sql script file so that it inserts the following records.
   a. Into the Student table, an additional tuple with the following values.
      - Your student id, first name, last name and HKUST email address.
      - Any phone number of your choosing (it does not have to be your phone number).
      - The value **null** for the cga attribute. ← **IMPORTANT!**
      - The value "COMP" for the departmentId attribute.
      - The value "2015" for the admissionYear attribute.

   b. Into the EnrollsIn table, five additional records with the following values.

| studentId | courseId | grade |
|---|---|---|
| <your student id> | COMP3311 | 95.6 |
| <your student id> | COMP4021 | 88.3 |
| <your student id> | ELEC3100 | 93.1 |
| <your student id> | HUMA1020 | 88.4 |
| <your student id> | MATH2421 | 90.5 |

3. **Place** your modified InsertMyself.sql script file inside the Lab5Exercise folder.
4. **Complete** the **TODOs** in the Lab5CgaCalculations.sql script file to do the following.
   a. Complete the declaration of the all the variables needed for the cga calculation as well as the declaration of the enrollsInCursor for the EnrollsIn table.
   b. For each student record
      i. retrieve all the related EnrollsIn records and collect the data needed to calculate the cga.
      ii. calculate the cga to two decimal places according to the formula given below and update the student record with the calculated cga.
      iii. insert the student record into the LowCga table if the cga is less than or equal to 2.
      **Note:** The LowCga table is created by the Lab5.sql script file.

   **Note:** The command dbms_output.put_line(*<string>*) outputs *<string>* to the Script Output pane where *<string>* is replaced with any character string enclosed in single quotes (see the script file for an example).
5. **Execute** the Lab5TestQueries.sql script file inside the Lab5Exercise folder in SQL Developer. This script file contains the following code:

```
set serveroutput on;
set pagesize 30;
set termout off;
@Lab5
set termout on;
@Lab5CgaCalculations
select studentId, firstName, lastName, cga from Student order by cga desc;
select studentId, firstName, lastName, cga from LowCga order by cga desc;
```

Enables the display of the results of a dbms_output.put_line command (set serveroutput on), sets the output page size to 30 lines, disables display to the Script Output pane (set termout off) and enables it again (set termout on).

The final two lines display the result of calculating each student's CGA as well as those students whose CGA is less than or equal to 2.

**CGA Calculation**

$$\text{CGA} = \frac{\sum(\text{course credits} \times \text{course grade points})}{\sum \text{course credits}}$$

Grades should be converted to grade points according to the following formula:

course grade point = maximum((grade / 20) – 1, 0)

Note that the code to do this conversion is already given in the Lab5CgaCalculations.sql script file.

**Important Note**

Any changes made to your PL/SQL procedure in the SQL Developer code editor are not reflected in the script file containing the procedure until you save it. Since your PL/SQL procedure is referenced from a script file, ***you must save any changes you make in your PL/SQL procedure before you run the script file that references the procedure***. Otherwise, the script file that refences your PL/SQL procedure will execute the file containing your PL/SQL procedure without your corrections and you will see the same errors as before!

## WHAT TO SUBMIT

1. Your modified Lab5CgaCalculations.sql script file.
2. A screenshot of the SQL Developer window or a text file that shows the result of running the Lab5TestQueries.sql script file in the Script Output pane as shown in Figure 1.

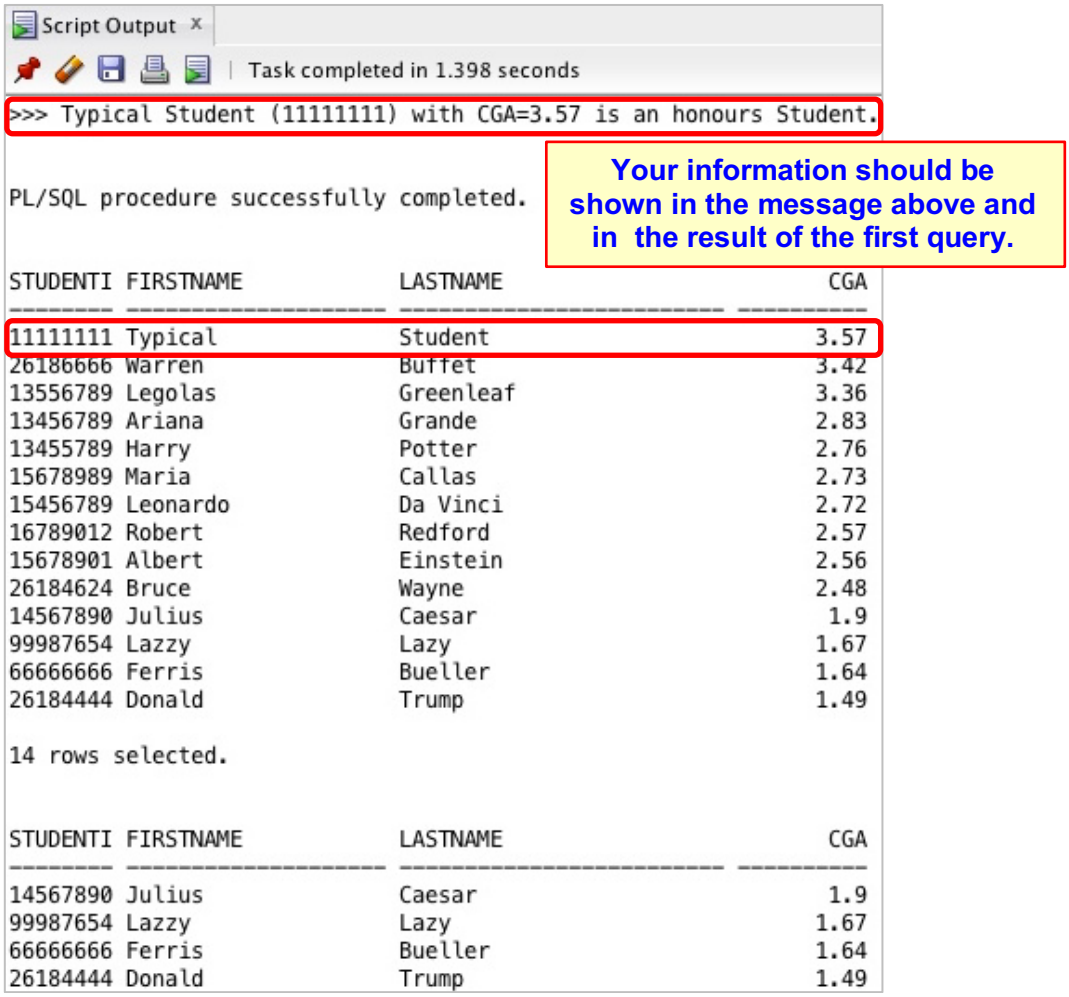


Figure 1: Example SQL Developer Script Output pane showing the result of executing the Lab5TestQueries.sql script file.

## HOW TO SUBMIT

**By 11:59 p.m. on Friday of the current week**, upload your Lab5CgaCalculations.sql script file and the screenshot or text file showing the result of running the Lab5TestQueries.sql script file to Canvas by selecting "Lab 5" in the Assignments section of Canvas, and then selecting the "Submit Assignment" button. To check your submission, select the "Submission Details" button on the right side. For help, select the "Help" button at the top-right of Canvas.