COMP 3311: Database Management Systems

Lab 6 Exercise: Oracle PL/SQL and Stored Procedures

WHAT TO DO

1. **Download** the zipped folder Lab6Exercise.zip from the ***Oracle PL/SQL and Stored Procedures*** entry of the Lab Schedule course webpage and **unzip** it. The folder contains two SQL script files Lab6DB.sql and Lab6Queries.sql and a text file Lab6CgaCalculations.txt.
2. **Place** your InsertMyself.sql script file inside the Lab6Exercise folder and **modify** it so that it inserts the value **null** for the cga attribute. ***All other values should be the same as those for Lab 5.*** ← **IMPORTANT!**
3. **Execute** the Lab6DB.sql script file in SQL Developer.
4. In the Connections pane of SQL Developer, expand your connection, right-click the Procedures node and select New Procedure... from the context menu. In the Create Procedure dialog name the procedure Lab6CgaCalculations and select the OK button.
5. **Replace** all the code in your Lab6CgaCalculations procedure with the code in the file Lab6CgaCalculations.txt.
6. **Complete** the **TODOs** in the Lab6CgaCalculations procedure to do the following.
   a. Complete the declaration of the all the variables needed for the cga calculation as well as replace with the correct select statement the declaration of the enrollsInCursor for the EnrollsIn table.
   b. For each student record retrieved by the studentCursor
      i. retrieve all the current student's related EnrollsIn records and collect the data needed to calculate the student's cga.
      ii. calculate the student's cga to two decimal places according to the formula given below and update the student's record with the calculated cga.
      iii. insert the record into the LowCga table if the cga is less than or equal to 2. The LowCga table is created by the Lab6DB.sql script file.

   Note: The command dbms_output.put_line(*<string>*) outputs *<string>* to the Script Output tab where *<string>* is replaced with any character string enclosed in single quotes (see the script file for an example).
7. ***After your** Lab6CgaCalculations **procedure executes correctly**,* **execute** the Lab6Queries.sql script file in SQL Developer. The Lab6Queries.sql script file contains the following code.

```
clear screen
set serveroutput on
set pagesize 30
set termout off
@Lab6DB
set termout on
set feedback off
exec Lab6CgaCalculations;
select studentId, firstName, lastName, cga from Student order by cga desc;
select studentId, firstName, lastName, cga from LowCga order by cga desc;
```

The set commands do the following:
- set serveroutput on - enables display of the dbms_output.put_line command argument;
- set pagesize 30 - sets the output page size to 30 lines;
- set termout off - disables display to the Script Output tab;
- set termout on - enables display to the Script Output tab.

The third last line executes your Lab6CgaCalculations procedure. 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

A student's cga is calculated according to the following formula:

$$\text{cga} = \frac{\sum(\text{course credit} \times \text{course grade point})}{\sum \text{course credit}}$$

For each course in which the student is enrolled, multiply the course credit by the course grade point and sum these values for all the courses. Then, divide the previous sum by the sum of the course credit of all the courses in which the student is enrolled.

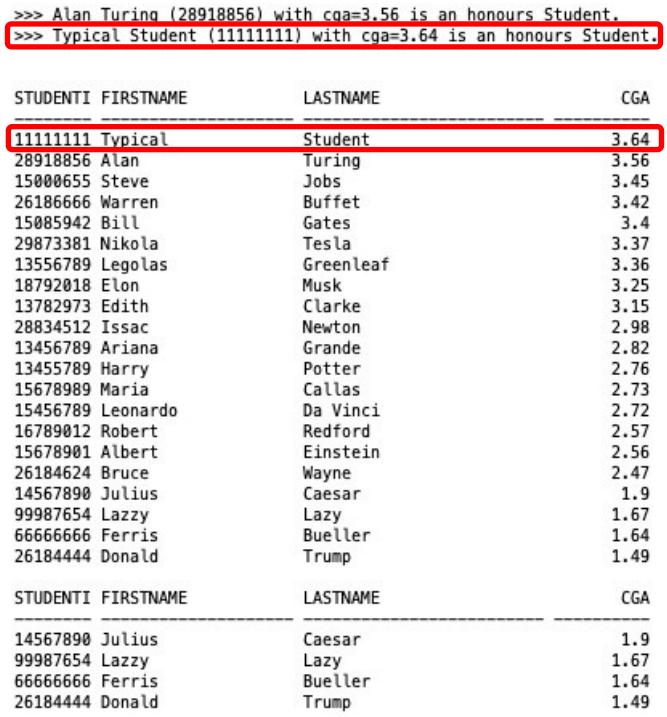
To obtain the grade point for a course, convert the course grade to a grade point according to the following formula:

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

Note that the code to do the grade to grade point conversion is already given in the file Lab6CgaCalculations.

WHAT TO SUBMIT

1. Your completed Lab6CgaCalculations procedure code as a text file. You can copy and paste your code from SQL Developer into a text (txt) file.
2. A screenshot of the SQL Developer window or a text file that shows the result of running the Lab6Queries.sql script file in the Script Output tab as shown in Figure 1.



```
>>> Alan Turing (28918856) with cga=3.56 is an honours Student.
>>> Typical Student (11111111) with cga=3.64 is an honours Student.

STUDENTI FIRSTNAME            LASTNAME                       CGA
-------- -------------------- -------------------------- ----------
11111111 Typical              Student                          3.64
28918856 Alan                 Turing                           3.56
15000655 Steve                Jobs                             3.45
26186666 Warren               Buffet                           3.42
15085942 Bill                 Gates                             3.4
29873381 Nikola               Tesla                            3.37
13556789 Legolas              Greenleaf                        3.36
18792018 Elon                 Musk                             3.25
13782973 Edith                Clarke                           3.15
28834512 Issac                Newton                           2.98
13456789 Ariana               Grande                           2.82
13455789 Harry                Potter                           2.76
15678989 Maria                Callas                           2.73
15456789 Leonardo             Da Vinci                         2.72
16789012 Robert               Redford                          2.57
15678901 Albert               Einstein                         2.56
26184624 Bruce                Wayne                            2.47
14567890 Julius               Caesar                            1.9
99987654 Lazzy                Lazy                             1.67
66666666 Ferris               Bueller                          1.64
26184444 Donald               Trump                            1.49

STUDENTI FIRSTNAME            LASTNAME                       CGA
-------- -------------------- -------------------------- ----------
14567890 Julius               Caesar                            1.9
99987654 Lazzy                Lazy                             1.67
66666666 Ferris               Bueller                          1.64
26184444 Donald               Trump                            1.49
```

Your record should be shown in the top message and in the result of the first query.

Figure 1: Example SQL Developer Script Output tab showing the result of executing the Lab6Queries.sql script file.

HOW TO SUBMIT

By 11:00 p.m. today, upload your completed Lab6CgaCalculations.txt text file and the screenshot or text file showing the result of running the Lab6Queries.sql script file to Canvas by selecting *Lab 6* in the Assignments section of Canvas, and then selecting the Submit Assignment button.