COMP 3311: Database Management Systems

Lab 7 Exercise: Oracle Indexing and PL/SQL Exceptions

HOW TO GET THE CREDIT FOR THIS LAB

1. **Download** the zipped folder Lab7Exercise.zip from the ***Oracle Indexing and PL/SQL Exceptions*** entry of the Lab Schedule course webpage and unzip it. The folder contains two script files, Lab7DB.sql and Lab7Queries.sql, and one text file, Lab7CgaCalculations.txt.
2. **Place** your InsertMyself.sql script file inside the Lab7Exercise folder and **modify** it so that it creates a unique index on the attribute email of the Student table.
3. **Execute** the Lab7DB.sql script file in SQL Developer to confirm that there are no errors in your InsertMyself.sql script file.
4. **Create** a stored procedure named Lab7DuplicateEmailCheck in SQL Developer that checks whether a unique index exists on the email attribute of the Student table. To perform this check, the procedure should
   a. attempt to insert a Student record with a known duplicate email (e.g., your student record) and
   b. handle this implicit exception by outputting the message:

      ### Tried to insert duplicate email into the Student table.

   Note: You should use the predefined exception **DUP_VAL_ON_INDEX** that raises an exception when a duplicate value is inserted into a unique index (see the lab notes).
5. **Create** a stored procedure named Lab7CgaCalulations in SQL Developer.
6. **Replace** the code BEGIN...NULL; in your Lab7CgaCalculations procedure with the code in the file Lab7CgaCalculations.txt. ***Be careful not to delete or replace either the first or last statement of the procedure.***
7. **Complete** the **TODOs** in the Lab7CgaCalculations procedure to do the following additional tasks.
   a. Define a user exception that is raised if the student is an honours student (i.e., the student's cga is greater than or equal to 3.5) and outputs the following message when the exception is raised:

      >>> *<student name>* (*<student id>*) with CGA=*<studentCga>* is an honours student.

   b. If a student has not enrolled in any course, then he/she will not have any related EnrollsIn tuples. In this case, when the student's CGA is calculated, the denominator will be zero and a divide-by-zero error will be raised. Therefore, add an exception handler that handles a divide-by-zero error when calculating a student's CGA.

      Note: You must use the predefined exception ZERO_DIVIDE to check for this error. If a divide-by-zero error occurs, then the exception handler should output the following message:

      ### *<student name>* (*<student id>*) is not enrolled in any course.

      You should also ensure that if a divide-by-zero error occurs, then *the student's CGA is not updated* (i.e., it remains set to null). **Note:** This exception should be handled in a sub-block.
   c. If the CGA is less than or equal to 2, then output the following message:

      *** Low CGA alert for *<student name>* (*<student id>*) with CGA=*<studentCga>*.

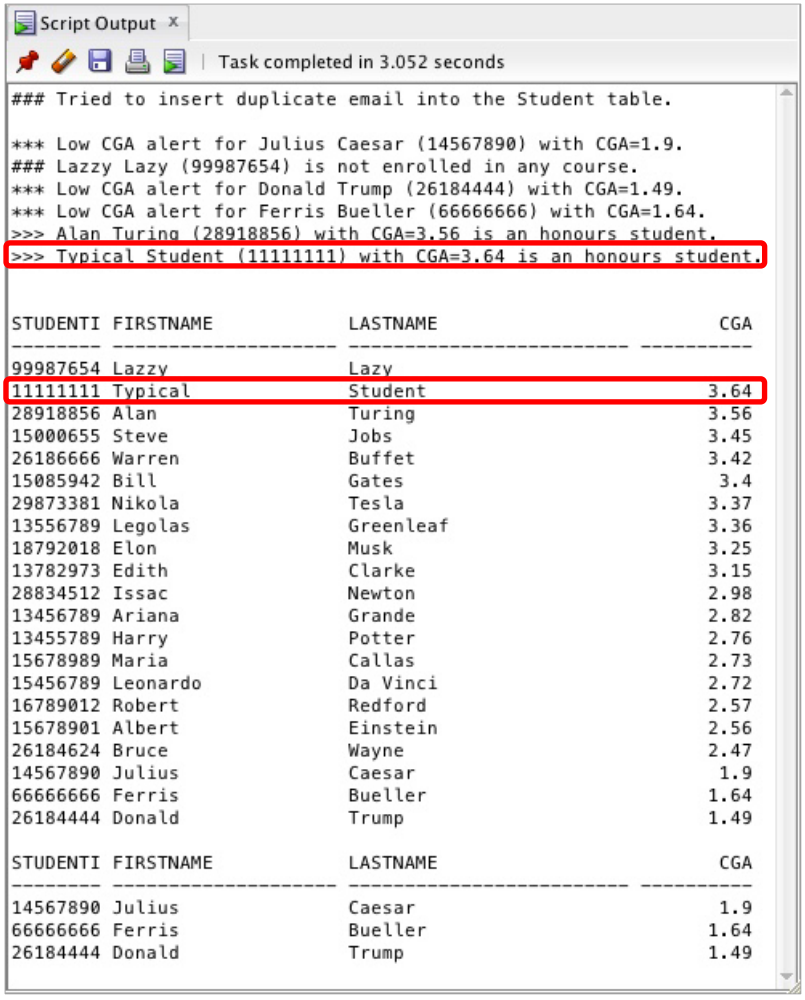
      In the preceding messages, you should replace *<student name>* with the concatenation of the first and last name of the student, *<student id>* with the student's student id and *<studentCga>* with the student's calculated CGA.
8. ***After your** Lab7DuplicateEmailCheck and Lab7CgaCalculations **procedures execute correctly**,* **execute** the Lab7Queries.sql script file in SQL Developer.

WHAT TO SUBMIT

1. Your completed Lab7DuplicateEmailCheck 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 Lab7Queries.sql script file in the Script Output pane as shown in Figure 1.

HOW TO SUBMIT

By 11:00 p.m. today, upload your completed Lab7DuplicateEmailCheck.txt text file and the screenshot or text file showing the result of running the Lab7Queries.sql script file to Canvas by clicking on *Lab 7* in the Assignments section of Canvas, and then selecting the Submit Assignment button.



Script Output

Task completed in 3.052 seconds

```
### Tried to insert duplicate email into the Student table.

*** Low CGA alert for Julius Caesar (14567890) with CGA=1.9.
### Lazzy Lazy (99987654) is not enrolled in any course.
*** Low CGA alert for Donald Trump (26184444) with CGA=1.49.
*** Low CGA alert for Ferris Bueller (66666666) with CGA=1.64.
>>> 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
-------- -------------------- ------------------------- ----------
99987654 Lazzy                Lazy
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
66666666 Ferris               Bueller                      1.64
26184444 Donald               Trump                        1.49

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

Your information should be shown in these lists.

Figure 1: Example Script Output pane showing the result of executing the Lab7Queries.sql script file.