

# COMP 3311: Database Management Systems

## Lab 7 Exercise: Oracle Indexing and PL/SQL Exceptions

### WHAT TO DO

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 Lab7CgaCalculations in SQL Developer.
6. **Replace** all the code in your Lab7CgaCalculations procedure with the code in the file Lab7CgaCalculations.txt.
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 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.

```

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

*** Low CGA alert for Julius Caesar (14567890) with CGA=1.9.
### Lazy 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	Lazy	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.