CS130 Databases Lab 5

PREAMBLE
If you have not connected to the PostgreSQL database on webcourse.cs.nuim.ie before then you will need to complete all of steps in the STAGE 1 Document in Lab 2.
If you have connected to the PostgreSQL database on webcourse.cs.nuim.ie before – then you will already have your username and database password. You will need to follow the steps in the STAGE 1 Document in Lab 2 from Step 1. Please note that your connection may still be available in PGAdmin.

MOST COMMON ERROR? Typing your database password incorrectly.

In this lab today you must connect to your OWN schema in the PostgreSQL database. This means that when you connect to PostgreSQL on webcourse.cs.nuim.ie you do not click on the public schema. You scroll through the cs130 database to find YOUR schema. Your schema will match your USERNAME – for example u181234 or p189876. When you have clicked on YOUR schema then you can open the PGAdmin query tool.

LAB STATEMENT.

The Gardai are introducing an automated speed detection system on a stretch of road near Maynooth. The stretch of road is where this system is being implemented is 2KM long and the entrance time and exit time of all vehicles are measured automatically. This speed detection system works from 1am until 11pm every night on a trial basis. The speed limit on this stretch of road is 60 Km/hour. Due to strict enforcement ANY speed over this limit is deemed as a violation. Entrances and exits before 1am or after 11pm are not recorded in this prototype system.

When you are wriiting SQL code below DO NOT COPY AND PASTE SQL code directly from the lecture slide PDFs into PGAdmin. You will get errors related to character encoding indicating that there is a character error with your SQL You should TYPE YOUR OWN SQL in to the PGAdmin Editor window.

Task 1: Write a CREATE TABLE Statement to create a suitable table structure for the sample of the data collected and presented below. You are encouraged to use the SERIAL data type as the PRIMARY KEY.

Then write an appropriate number of INSERT statements to insert the data below into your table.

YOU must make the decision on the data types, column names, etc. for this task. Subsequently, there are a number of different correct ways you can create this table.

You should save your work in an SQL file. Save your work as you go along.

Car Registration	Direction of Travel	Total Number of Vehicle Occupants	Entrance Time	Exit Time
171-KE-2098	Eastbound	3	15:15:30 on Jan 1st 2017	15:17:50 on Jan 1st 2017
161-CD-987	Westbound	1	04:30:20 on 13 of February 2017	04:31:40 on 13th of February 2017
J19-CS130	Eastbound	4	Exactly 6pm on 31st of May 2017	18:02:40 on 31st May 2017
12-WD-1767	Westbound	2	07:40:10 on 7th June 2017	07:41:50 on 7th June 2017

Task 2: Write `DROP TABLE` command at the very beginning of your SQL file. The DROP TABLE syntax is as follows `DROP TABLE IF EXISTS TABLE-NAME;` You must supply the `TABLE-NAME`

Task 3: The car in the final row of the table above returned on the Eastbound direction later on the same day. The car has an entrance time of exactly 1 minute to 3pm and an exit time of 50 seconds after 3pm. You can choose the time on which this car returned.

Write an INSERT statement to insert this observation into the database table you have created.

Task 4: Test out what happens when we use the `TRUNCATE` statement.
The `TRUNCATE` statement works as follows `TRUNCATE TABLE-NAME;` You must supply the `TABLE-NAME`.

You will be asked a question about this on the Moodle Quiz.

When you have finished with this task you should comment out the TRUNCATE statement by placing two hyphens at the beginning of the line.

Then re-run your whole SQL file again.

Task 5: Testing out what happens when we use the `DELETE` statement.

The `DELETE` Statement works as follows `DELETE FROM TABLE-NAME <conditions>;`

Test out the `DELETE` statement WITHOUT using any conditions.

You will be asked a question about this on the Moodle Quiz.

Task 6: Suppose that the REGISTRATION NUMBER for the car in the first row of the table is incorrect. All other details are correct.
Use your SQL file to fix this problem and update the registration plate to the correct number 171-KE-2980

You should NOT use an UPDATE statement as these have not been covered in CS130 yet.

Task 7:

Issue the following two SQL Statements to your table.

```
ALTER TABLE TABLE-NAME ADD COLUMN Speeding VARCHAR(30);

UPDATE TABLE-NAME SET Speeding = NULL;
```

You will be asked a question about this on the Moodle Quiz.

Task 8:

You must have completed Task 7 before writing Task 8.

Two cars (161-KE-1234 and 171-D-9988) both travel Eastbound on this stretch of road TODAY during your CS130 Lab. They are travelling together but are one minute apart. It takes them 3 minutes to drive the 2KM stretch.

Exactly two hours later, they BOTH return travelling Westbound. As before they are both one minute apart. On the return journey they take 2 minutes 30 seconds to drive the 2KM stretch.

You can choose the journey times as appropriate.

In all journeys there are two people in each car.

Write an appropriate number of INSERT statements to insert all of these trips into the database.

Task 9:

Write an SQL query which indicates the journeys in the database above where the cars are detected as speeding within this zone – that is they have travelled at ANY speed of greater than 60 Km/h on this stretch of road.

To test if your query works you should INSERT another new car journey into the database where this journey corresponds to a car which is obviously speeding in this stretch of road.

You will need to input your answers to the Moodle Quiz for this lab session. This will be the only way you will be assessed for the CA for this lab. You are advised to save your work regularly and to make note of the answers to these questions. You can only submit your answers to the Moodle Quiz twice.

While demonstrators will not be checking or assessing your answers – any demonstrator can ask you to show your SQL queries running.

COPYING OF SQL OR ANSWERS BETWEEN STUDENTS WILL RESULT IN ZERO MARKS