1812ICT/2814ICT – DATA MANAGEMENT
7003ICT – DATABASE MANAGEMENT
School of Information & Communication Technology
Trimester 1, 2023

Assignment Part 2:
Implementing a Database for Commonwealth Transport Services

Aims

- To analyse and comprehend a given ER diagram and Database schema.
- To implement a database based on the given ER diagram and Database schema.
- To write required SQL statements to query the database.
- To write SQL statements to manipulate the data in the database.

Learning Objectives

In the process of this assessment task, you will:

- plan, schedule and execute project tasks with a view to improving your personal productivity,
- gain awareness of the typical challenges related to the practical implementation of databases,
- learn how to use Data Definition statements to implement a database from a given ER diagram and the corresponding Database schema, and
- learn how to use Data Manipulation statements to query a database and insert and update data in the tables.

Due date:	Week 11, 26 May Friday, 5:00 PM One submission per group, file named as 'a1-<Student_ID>.pdf'. Any/lead student's ID in the group is fine.
Late submission:	Any submission after the due date will receive **a deduction of 5% per calendar day**. Standard university policy will apply for all late submissions. See the course website/profile for detail.
Marks:	Group submission: a total of 100 marks and it is worth 10% out of the total assessment
Extensions:	An extension will only be **considered** with supporting documentation from a health professional **and** if the problem/illness occurred **within the week prior to the due date**. If an extension is granted the extension will then equal the number of days specified on the doctor's certificate, with a *maximum limit of five (7) calendar days*.
Authorship:	This assignment is a **Group assignment**, and it shall be completed by **the students in each group** only. The final submission must be identifiably the work of the individual group members. Breaches of this requirement will result in an assignment not being accepted for assessment and may result in the offending student or students being required to present before the Disciplinary Committee.

Assignment Specification

Commonwealth Transport Services (CTS) now require a partial implementation of the design made in Assignment Part 1. To keep consistency between the assignments, database specification containing the ER diagram and the corresponding schema are provided in this document. You should create your database according to this documentation. Make sure that your implementation is consistent with this design, i.e., your table names, field names, and data types are according to the specifications provided in this document. The implementation phase includes writing SQL statements to create a database and its tables, populating the tables with appropriate test data, and writing a number of queries to create reports that can be used by the management team. You need to insert at least five records in each of the tables and ensure that each of the query returns at least one record.

Implementation of the Database and Manipulation of the Data

You are required to perform the followings tasks:

1. **Task 1:** Create a text file named Create_<GroupNumber>.txt (for example, Create_Group5.txt) that will contain SQL statements to:
   I. Create a database named CTSDB<GroupNumber> (e.g., CTSDBGroup5).
   II. Create all the tables for the database according to the Database schema given with this document (separately attached).
2. **Task 2:** Create a text file named Insert_<GroupNumber>.txt (for example, Insert_Group5.txt) that will contain SQL statements to:
   I. Insert at least ***five*** (5) records in each of the tables. The test data inserted into the table must ensure that each of the queries, specified in Task 3, outputs at least one record.
3. **Task 3:** Create a text file named Query_<GroupNumber>.txt (for example, Query_Group5.txt) that will contain all the queries to display the following
   I. A list of available Drivers sorted according to their clearance level. Display the driver's licence number, first name, last name, and the clearance level.
   II. Find the Locations whose city names consist of one or more words, and the last word is four character long ending with a 'k'. For each such location, display its street number, street name, and city.
   III. A list of Officials and their highest preferred languages. Sort according to their First name followed by Last name. Display their full names and the highest preferred languages (names and preferences). Note that there is only one highest preferred language for each official.
   IV. The date on which the most recent Trip(s) was(were) completed. Show the date as well as the vehicle model(s) and type(s) (description) involved in the trip(s).
   V. List the Vehicles which have been driven more than 1000 KM in total. Display the vehicle registration numbers and total kilometres travelled. Show the list sorted by total kilometre travelled.
   VI. Find the Passenger Vehicles whose one or more (single) repair costs were more than the average repair cost of all vehicles. For each vehicle, display the vehicle registration number, make, model, seat capacity, and total repair cost. Note that if a vehicle went for multiple repairs, its total repair cost is the sum of all these (single) repair costs.
   VII. A list of all Drivers who have not been involved in any trip yet. Display the drivers' full names, security clearance levels, and the languages they speak with at their highest proficiency levels. Note that a driver may speak in more than one language at his/her highest level of proficiency.

VIII. For each vehicle type (e.g., Sedan), list the number of future bookings of vehicles if number of future bookings in each type is more than 2. For each vehicle type, display the number of bookings. Sort the output in descending order of the number of bookings.

Additional queries for 7003ICT students only:

I. List the completed Trips whose actual travel time were at least 15 minutes less than the intended travel time. Display the corresponding drivers' and officials' full names. Sort the output in ascending order of the trip completion date.

II. Find the Trips whose pick-up locations' street name and drop-off locations' street name are the same, but these streets are located at different cities. Display the full names of the Drivers, full name of the Officials, and the street names (only) and the cities of the pick-up and drop-off locations.

4. **Task 4:** [for all students] Create a text file named Booking_<GroupNumber>.txt (for example, Booking_Group5.txt) that will perform the followings. Insert additional data in the tables appropriately if needed.

   I. An Official named Daniel Ortega from Spain, having OfficialID SPN99745, wants to make a booking. He speaks in both Spanish and English, Spanish being his highest preferred language. Spanish is currently spoken by 94% of the total population in Spain. He will play the role of a 'Judge' in the games. He wants to travel from 16 Brendan Thorne Place, Gold Coast (Rydges Gold Coast) to 117 Rubicon Crescent, Surfers Paradise (Swimming Pool) on April 9, 2023. His expected start time is 10:00 am and end time is 10:45 am.

   II. The above trip is then planned to complete using the Sedan vehicle having VIN number SANFDAE33U1286116. The starting odometer reading for the vehicle is 126,982 KM. A driver with the highest preferred language of the official is not available, so the driver Md Polash with language proficiency level 4 in English and security clearance level 2 is booked. His licence number is 098675532. The trip actually starts at 10:15 am and ends at 11:55 am on the same date. At the end of the trip the odometer reading is recorded as 127,119 KM.

You are required to adhere to the following output formatting conventions:

- All monetary values should be printed with a dollar symbol ($).
- You must use consistent and legible formatting in laying out your SQL queries. Include (brief) comments for any query or procedure that uses an "unusual" approach.

What to submit?

An electronic copy of your assignment should be submitted online and should include a copy of your report and the four files described in Task 1 to Task 4 above. Zip all the files into a single file named 'a2-<GroupNumber>.zip' (for example, a2-Group5.zip) before uploading.

Your report should include:

- Use the supplied template for your Assignment Report.

- An appropriate title page that includes an acknowledgement of all students you have spoken to about the assignment.
- A table of contents and page numbers.
- A report of the results from running the SQL queries (Task 3) by using copy/paste of their output.
- A bibliography containing a list of all resources used to complete the assignment. If no resources, apart from the course materials, have been used please indicate this.

Assessment Criteria

- How clear and well organised your presentation is. On the front page of your report, you should include a list of acknowledgements of all people who have assisted you with this assignment including fellow students.
- Adherence to our standards. How clear and well organised your presentation is. You should write all the queries in consistent style and use indent format.
- Data correctness and quality. Please use appropriate data for your examples (e.g., do not use inappropriate person names)
- Please refer to the provided marking guide (below) to see the distribution of marks.

Assignment Resources

Find the following information in attached files:

- The logical ER Diagram, and
- Relational Database Schema.

Assessment Criteria and Marking Overview

For 1812ICT/2814ICT students only:

ITEM	Marks
1. Presentation How clear and well-presented your submission is.	8
2. Creation of database and tables (Task 1) Create the relevant tables: Database correctly named and created, includes all the PKs and FKs in the database. No evidence that tables have been created using the GUI and exported. They work properly.	20
3. Insertion (Task 2) Successfully insert data into the tables. NO evidence exporting from the GUI. They work properly.	30
4. Query (Task 3) Use of appropriate query statements. They work as intended. Each query should output at least one row of valid data.	32
5. Booking (Task 4) Use of appropriate data manipulation statements to perform the required actions. They work as intended.	10
Total	**100**
Out of 10% of the total assessment	**10**

For 7003ICT students only:

ITEM	Marks
1. Presentation How clear and well-presented your submission is.	5
2. Creation of database and tables (Task 1) Create the relevant tables: Database correctly named and created, includes all the PKs and FKs in the database. No evidence that tables have been created using the GUI and exported. They work properly.	20
3. Insertion (Task 2) Successfully insert data into the tables. NO evidence exporting from the GUI. They work properly.	30
4. Query (Task 3) Use of appropriate query statements. They work as intended. They work as intended. Each query should output at least one row of valid data.	35
5. Booking (Task 4) Use of appropriate data manipulation statements to perform the required actions. They work as intended.	10
Total	**100**
Out of 10% of the total assessment	**10**

Mark deductions (out of 10 marks)	**Marks**
If a student submits assignment individually, not as part of a group without prior permission from the course convenor. Maximum deduction of marks.	-1
If all group members do not contribute the *same* in terms of percentages, then any student with a *lower* contribution will get their marks deducted.	*varies*
Only concepts taught in this course are to be used. If concepts not covered in this course are used, marks will be deducted.	*varies*

References:

[1] Language Codes, https://en.wikipedia.org/wiki/List_of_ISO_639-1_codes.
[2] Country Codes, https://en.wikipedia.org/wiki/ISO_3166-1.
[3] Language Proficiency Levels, https://corporatefinanceinstitute.com/resources/career/language-proficiency-levels/.