**Module:** Introduction to Databases

**Academic Year:** 2022/23, Sem I

**Programs:**

**Assessment type**: Continuous assessment

**Weight:** 40%

**Deadline**:

**Background:**

This project is intended to assess students’ understanding of database design and implementation including Conceptual data modelling, logical & physical data modelling, Data Definition Language, and Structured Query language.

**Part 1: Conceptual Design - 40%**

1. Suggest a situation where you can use a database to manage and record daily transactions. (200-400 words). (10 marks)
2. Draw a suitable ER diagram for your database; consider the following in your conceptual design:

* Include at least five entities.
* The relationship between entities should include one to one, one to many and many to many.
* Provide an example of a derived attribute in your design.

(15 marks)

1. Convert the conceptual design into a relational model. Make sure that the tables are in a 3rd normal form. (15 marks)

**Part 2: Physical design - 20% (5 marks each)**

1. Create the corresponding database using DDL
2. Create all the necessary tables identified above using DDL
3. Populate at least three of your tables with some data using DML (insert into statement)
4. Populate your database with a large data set representing a one-year transaction (01/01/2022 - 31/12/2022) on each table. (Use online data generators such as [Mockaroo](mailto:https://www.mockaroo.com/) or [generate data](mailto:http://www.generatedata.com/) to generate synthetic data.)

**Part 3: Write SQL Statements to answer the following queries - 40%**

1. Show the total number of transactions your database is storing and, depending on your database, the most sold/listed item or customer with the highest number of purchases.

(5 marks)

1. Write a query statement that includes “Order by” and “Group by”.

(6 marks)

1. Write a query statement that uses pattern matching (example: customer living in a given street, number of Johns, people with today’s birthday…).

(6 marks)

1. Show information from three tables based on criteria of your choice (hint: join).

(6 marks)

1. Create a view that includes information from the most frequent seven transactions (customer names or most sold items …).

(6 marks)

1. Create a report of the annual transactions showing the total number of transactions with corresponding details every month (use A group by with roll-up)

(6 marks)

**Submission checklist:**

1. A pdf/word document containing the answers to each of the above questions. Please add all your answers including descriptions, SQL Scripts and diagrams (ERD, report charts or graphs in this file) for each of the questions where applicable.

2. An SQL script file that contains all the SQL statements used for part 2 and part 3. Each answer should have a clear label indicating the question number.

3. The dump file (self-contained SQL script) of the full database, including triggers and stored procedures.

**Submission Guideline:**

1. Submit your word document file separately using Turnitin
2. The SQL script file and the dump (self-contained) file in a folder and compress to a single zip folder. All your file names should use the following file name pattern.

[YourID]\_[YourProgramCode]\_[YourLastName]\_[YourFirstName]\_Description.doc/pdf

[YourID]\_[YourProgramCode]\_[YourLastName]\_[YourFirstName]\_SQL.sql

[YourID]\_[YourProgramCode]\_[YourLastName]\_[YourFirstName]\_Dump.sql

[YourID]\_[YourProgramCode]\_[YourLastName]\_[YourFirstName]\_Project.zip

Example:

X123456\_ HDSWT\_SEP1 \_Adams\_Brian\_Description.doc