TIS3351 Advanced Database
Trimester 2, Session 2021/2022
Faculty of Computing and Informatics
Multimedia University

Submission Date : 28th Mar 2021, Noon

Individual Assignment

This is an individual assignment. STRICTLY NO COPYING from other sources except codes given in this course. If detected all parties involved will get 0 marks.

Assignment

In this assignment, design and implement an operational data store and a data warehouse with an ETL (Extract, Transform, Load) scheme for the Faculty of Computing and Informatics at Multimedia University.

The main entities to be modelled include but are not limited to Student, Lecturer, Courses, and Assessment Marks. Add more entities if needed. Attributes related to Student should include high school, state of origin, SPM or UEC results, gender and age. Attributes related to Lecturer should include highest qualification, major, age and academic post. The assessment marks consist of, assignment (30 marks), tests (20 marks), quiz (10 marks) and the main exam (40 marks).

The grading system used is as follows

A (80 - 100 marks),
B (60 - 80 marks),
C (50 - 60 marks) and
F (< 50 marks)

GPA and CGPA need not be captured in this assignment.

There are three parts to implement.

Part 1

Draw the Entity-Relationship Diagram (ERD) of the operational data store in the third normal form and convert the ERD to a relational schema. Describe any design assumptions made. Implement the relational schema with an SQL script file. Insert sufficient example data for thirty students, nine courses (three for each trimester for Trimester 1, 2 and 3) and six lecturers.

Part 2

Draw the ERD of the data warehouse and convert the ERD to a relational schema. Implement the data warehouse with an SQL script file. Implement an ETL scheme with one or multiple SQL script files, one script file for each trimester, to extract data from the

operational data store and load them into the data warehouse. If needed, create and drop temp tables during the ETL process. An ETL operation is to be run every trimester.

Part 3

Implement five possible queries for the data warehouse. Assume the queries are used by the President of MMU to gain an insight into the current state of MMU from various perspectives.

Deliverables

a) ERD
b) Relational schema
c) Design assumptions made
d) SQL scripts
e) The corresponding SQL output text

Additional Info on Deliverables

i) Items a, b and c should be put into a PDF file. In the PDF file, insert the following information at the top of the file.

```
Name: Jason Morgan
ID: 1071001234
Email: abc123@yourmail.com
Phone: 018-1234567
```

ii) Put items a to e into a folder, zip it and submit the zip (.zip) file. The name of the zip file should be "1071001234.JASON.MORGAN.zip"

iii) Submit your assignment through MMLS.

Evaluation Criteria

Mark Sheet

Criteria	Max	Actual Marks
Operational Data Store		
ERD	5	
Relational schema and design assumptions	3	
Example data	2	
ETL		
Data warehouse ERD	3	
Data warehouse relational schema and design assumptions	2	
ETL scripts for Tri 1, Tri 2 and Tri 3	5	

Data Warehouse		
DW query 1	2	
DW query 2	2	
DW query 3	2	
DW query 4	2	
DW query 5	2	
Extra Marks		
Graphical charts based on the results on DW queries 1-5	2.5	
Total	32.5	

Each feature will be evaluated based on fulfilment of requirements, correctness and being error free during runtime.