جامعة مصر للمعلوماتية
EGYPT UNIVERSITY OF INFORMATICS

FACULTY OF COMPUTING & INFORMATION SCIENCES

Introduction to Database Systems
Term Project
25% of the total grade

Students are required to form teams of 4-5 students from **the same group** and build any database system from the suggested topics given in the SWE course taught by Dr. Amal Elgammal. Any team can come up with **any other proposed system** idea, however, the system's full description requirement document should be approved by Prof. Mohamed Elsharkawi or Dr. Amany Eissa.

The project will be delivered on 5 phases as shown in guidelines below. Students are also allowed to implement any functionality defined in the proposed systems or proposing additional new functionalities.

1. Project Phases

Phase(1):

1. Deliverable: A document containing both the **entity relationship diagram** as well as **English Requirements** that describe the database requirements. In the requirements, you should give all business rules (constraints in the application). For example, in EUI a professor do not teach more than two courses in a semester. A student has to register in no less than 9 credits and no more than 18 credits, if the GPA of a student is 3.5 or more, she may register in 21 credits.

– The Document file to be uploaded on Canvas and Discussions will be in the lab.

Canvas Due Date: Saturday, October 26th, 2024 at 23:59pm.
Due Date: week starting Sunday October 27th, 2024 during lab time.

- Students are required to construct the system's ERD (conceptual model) - neatly hand drawn or on any CASE tool that uses one of course's accepted notations.
- ERD should include at least 5 entities, at least one Weak Entity.
- ERD should include at least 4 relationships at least one of which is many-to-many relationship. Indicating cardinality and participation constraints on the relationships.
- Primary keys, attributes and relationships should be clearly defined in the ERD.

- **Phase(2):** **(5 marks)**

  Deliverable: Revised Conceptual ERD + Corresponding relational schema + Implemented database on MS SQL Server

  Due Date: On Canvas on November 3rd, 2024 @ 23:59pm.

  - Students are required to convert the conceptual ERD delivered in phase 1 into relational schema -after applying all the adjustments based on TAs feedback on phase 1.
  - Both the conceptual and the relational schema will be delivered on Canvas and discussed in Labs.
  - Students will also deliver the database generated from the relational schema on SQL Server, populated with data. (codes for DB and Tables creation, should be delivered)

- **Phase(3):** **(8 Marks)**

  Deliverable: A list of all queries (not the ad hoc ones) that can be submitted and their corresponding SQL along with their frequencies in the application (if possible).

  Due Date: On Canvas on November 16th, 2024 @ 23:59pm

  Student should minimally write 8 non-trivial SQL statements including at least
  - 2 aggregate queries
  - 2 with the use of sub-queries
  - 2 involves joining more than two relations.

- **Phase(4):** **(4 marks)**

  Deliverable: A document describing the functional dependencies for all relations in the database, and the highest normal form of each relation.

  If the relation is neither in 3NF nor in BCNF, decompose the relation into dependency preserving BCNF, if not possible to achieve dependency preservation, decompose the relation into 3NF.

  Due Date: On Canvas on December 7th, 2024 @ 23:59pm

- **Phase(5):** **(10 marks)**

  An Application program that uses the database to be implemented using any programming language with GUI, that performs the following (at least):

  - 2 Insert Statements on 2 different tables.
  - 2 Delete Statements on 2 different tables (with conditions).
  - 2 Update Statements on 2 different tables [with condition].
  - Select data from any table(s) of the database.
  - Select data that involve more than one table of the database- (using joins).
  - Generate 2 meaningful report. Bonus

  Due Date: On Due Date: week starting December 29th, 2024 in Labs.

2- Proposed systems

You can find the applications proposed in the Software Engineering course in the following link:

https://docs.google.com/spreadsheets/d/1bgS0FzpXIcyN0dG0X5m353Gou1mkmBs4jVTBphGZPq0/edit?gid=0#gid=0