IEEE ZAGAZIG Student Branch

IEEE COMPUTER SOCIETY ZAGAZIG STUDENT CHAPTER

@Backend : Phase1

Task 1

/Database-ERD

/TODO

$ Watch First 3 Chapters from this Course till “mapping to relationship types”.

$ Watch these two videos on “using Lucid for ERD design”:

> Entity Relationship Diagram (ERD) Tutorial - Part 1

> Entity Relationship Diagram (ERD) Tutorial - Part 2: Primary key…

$ Other Useful resources along this phase:

> Baraa Course

> Eng-Ramy ITI Course

> DR-Amr Internal DBs Course

/Work_TODO

“You are the Lead Backend Engineer for 'UniCore'. The product manager has given you the business rules for the new university system. Your job is to translate these words into a technical ER Diagram and then map that diagram into a Relational Schema (Tables) that the development team can use.”

Analyse these rules to identify Entities, Attributes (Composite/Multivalued), Relationships, and Weak Entities.

$ Business Rules:

> The Department & Faculty (1:1 & 1:N)

- The university has multiple **Departments** (Attributes: Name, Code, Building Location).
- Each Department has many **Instructors** (Attributes: ID, Name, Salary, Hire Date).
- **Constraint:** An Instructor belongs to exactly **one** Department.
- **Constraint:** Each Department is managed by exactly **one** "Head of Department" (who is an Instructor). An Instructor can only manage one department.

> The Users & Contact Info (Attributes)

- For every **Student** and **Instructor**, we must store their **Address**.
- **Constraint:** The Address is complex; we need to access the *City*, *Street*, and *Zip Code* separately (Hint: Composite Attribute).
- **Constraint:** Both Students and Instructors can have multiple **Phone Numbers** (Hint: Multivalued Attribute).

> The Course Catalog (Recursive Relationship)

- Departments offer **Courses** (Attributes: Course Code, Title, Credits).
- **Constraint:** A Course can have other courses as **Prerequisites**. (e.g., "CS102" requires "CS101"). A course can have many prerequisites, and a course

can be a prerequisite for many others.

> **Student Dependents (Weak Entity)**

- The university offers health insurance to students' families. We need to track **Dependents** (Name, Birthdate, Relationship).
- **Constraint:** A Dependent cannot exist in the database without a related Student. If the Student leaves, the Dependent data is removed.

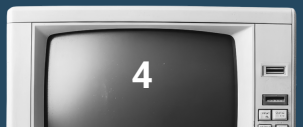
> **Enrollment (M:N Relationship with Attributes)**

- **Students** enroll in **Courses**.
- When a student enrolls, we must record the **Enrollment Date** and the final **Grade**.

/Required

> **An ER Diagram(Visual) Showing:**

- **All Entities (Strong & Weak).**
- **All Attributes (Simple, Composite, Multivalued, Key, Derived).**
- **All Relationships with correct Cardinality (1:1, 1:N, M:N) and Participation (Total/Partial).**
- **Use Lucidchart to make the ERD or any platform, but I will use Lucid in the model answer**



/How-To-Submit

$ After you finish all of that, make a folder on Google Drive, upload the ERD as Image and make a screen record explaining what you have done in 5-10 mins video.

$ Submit Google Drive folder link on the task chat on **Discord**, **and make sure that I can view the folder (give me access)**

You can make the access public to all or just give access to these emails:

mohamedadel96e@gmail.com

abdallahhamada2103@gmail.com

/Deadline

$ Thursday, February 12 at **11:59 PM**

Wish you the best.❤️