**Assignment: Database Design with Entity-Relationship and Logical Models**

**Objective:**

In this assignment, you will design and develop an Entity-Relationship (ER) model, a conceptual model, and a logical model for two case studies. The goal is to practice the skills needed to translate real-world scenarios into database designs.

**Case Studies:**

**Case Study 1: Library Management System**

You are tasked with creating a database for a public library. The library lends books and magazines to its members. Each member can have multiple memberships (e.g., adult, child, senior). Books are categorized by genre and are written by one or more authors. Members can reserve books but can only have up to 5 items checked out at any time.

**Case Study 2: College Registration System**

You have been hired to create a database for a college registration system. The college offers various courses taught by professors. Students enroll in courses, and each course may have **prerequisite** courses. Courses belong to departments, and students may major or minor in those departments.

**Tasks:**

1. **Conceptual Model**: Create a Business Definition table that explains the main concepts and their relationships in each case study. No diagram is created for this tsep.
2. **Logical Model**: Create tables based on your ER model.
   * Define primary keys, foreign keys, and data types for each table.
3. **Entity-Relationship Model (ER)**: Draw an ER diagram for each case study.
   * Include entities, attributes, relationships, and cardinality.
   * Create a SQL script that will create the tables required for both case studies

**Deliverables:**

1. Two ER diagrams (one for each case study)
2. Two conceptual models (A Business Definition table for each case study)
3. Logical models for each case study presented as SQL table creation commands.

**Submission Guidelines:**

* Your assignment must be submitted as a PDF document.
* Diagrams must be clearly labeled and legible.
* Include your name, student ID, and the date at the top of the document.

**Due Date: October 11, 2024**

Good luck!

## Grading Criteria:

### 1. Entity-Relationship Model (ER Diagram) - 40 Points

#### Case Study 1: Library Management System

* **Entities, Attributes, and Relationships (10 Points)**
  + All required entities identified: \_\_/5
  + Attributes correctly associated with entities: \_\_/3
  + Correct relationships between entities: \_\_/2
* **Cardinality and Constraints (10 Points)**
  + Correct cardinality indicated: \_\_/5
  + All constraints are correctly identified and modeled: \_\_/5

#### Case Study 2: University Registration System

* **Entities, Attributes, and Relationships (10 Points)**
  + All required entities identified: \_\_/5
  + Attributes correctly associated with entities: \_\_/3
  + Correct relationships between entities: \_\_/2
* **Cardinality and Constraints (10 Points)**
  + Correct cardinality indicated: \_\_/5
  + All constraints are correctly identified and modeled: \_\_/5

### 2. Conceptual Models (Textual Descriptions) - 30 Points

#### Case Study 1: Library Management System (15 Points)

* Clarity and completeness: \_\_/8
* Correct identification of key concepts and relationships: \_\_/7

#### Case Study 2: University Registration System (15 Points)

* Clarity and completeness: \_\_/8
* Correct identification of key concepts and relationships: \_\_/7

### 3. Logical Models (Tables and SQL Commands) - 30 Points

#### Case Study 1: Library Management System

* Table definitions: \_\_/10
  + Correct identification of primary keys: \_\_/3
  + Correct identification of foreign keys: \_\_/4
  + Appropriateness of data types: \_\_/3

#### Case Study 2: College Registration System

* Table definitions: \_\_/10
  + Correct identification of primary keys: \_\_/3
  + Correct identification of foreign keys: \_\_/4
  + Appropriateness of data types: \_\_/3
* **Bonus**: Proper use of comments and formatting in SQL: \_\_/5