DATABASE PROJECT

CE 280 and IS 280

Design and implement a comprehensive database system using SQL for a domain of your choice. Your task is to create a database schema that effectively manages the data and operations relevant to your chosen domain. The project should include the following components:

1. Entity-Relationship Diagram (ERD):
Develop an ERD that accurately represents the entities, attributes, and relationships within your chosen domain. Identify primary keys and relationships between entities.

2. Database Schema:
Implement a database schema based on your ERD, comprising at least six(6) tables. Ensure appropriate use of primary keys and foreign keys to maintain data integrity and enforce relationships between tables.

3. SQL Queries:
Write SQL queries to perform essential database operations, such as data retrieval, insertion, updating, and deletion. Include queries that demonstrate complex joins, filtering, and aggregation.

4. Stored Procedures, Triggers, and Functions:
Utilize stored procedures to automate common tasks or complex operations within the database system. Implement triggers to enforce business rules or maintain data integrity. Develop functions to perform calculations or validations as needed.

5. Transactions:
Incorporate transactions using commit and rollback commands to ensure atomicity, consistency, isolation, and durability (ACID properties) in database operations.

6. Additional Features:
Optionally, include additional features or functionalities that enhance the database system's utility and usability. This may include user authentication, access control, data encryption, or reporting capabilities.

Instructions for Students:

1. Select a Domain:

Choose a domain or industry that interests you or aligns with your career aspirations. Examples include healthcare, finance, retail, education, transportation, or entertainment.

2. Define Requirements:
Clearly define the requirements and objectives of your database system based on your chosen domain. Consider the types of data to be stored, the relationships between entities, and the operations that need to be supported.

3. Design the Database Schema:
Develop an Entity-Relationship Diagram (ERD) to model the structure of your database. Identify entities, attributes, and relationships, and translate them into tables, columns, and constraints in your database schema.

4. Implement the Database:
Create the database schema in your chosen database management system (e.g., MySQL, PostgreSQL, SQL Server). Write SQL scripts to create tables, define constraints, and establish relationships between tables.

5. Write SQL Queries, Procedures, Triggers and Functions
Write SQL queries to perform CRUD (Create, Read, Update, Delete) operations on your database tables. Additionally, implement stored procedures, triggers, and functions to automate tasks and enforce business logic.

6. Test and Iterate:
Test your database system thoroughly to ensure that it meets the specified requirements and functions as expected. Iterate on your design and implementation based on feedback and testing results.

7. Document Your Work:
Document your database design, schema, SQL queries, and any additional features implemented. Provide clear explanations and rationale for design decisions and implementation choices.

Submission Date:
NB: Copy work will attract zero mark.

By completing this project, students will gain valuable experience in database design, SQL programming, and database management, preparing them for real-world scenarios in various industries and domains.