DATABASE SECURITY PROJECT --GUIDELINES & REQUIREMENTS

Project (25% of the total grade)

Database Security Project: (100 points)

Objectives: Your important responsibility in this course is to complete a project. Your project topic, plan, analysis, and design should be based on the Database security concepts covered in the course. You are required to develop a fully functional database which should provide advanced-level security features.

In this advanced-level database security project, you will implement a secure database using MySQL Workbench. The goal is to incorporate various security components required by modern enterprise databases to ensure the confidentiality, integrity, and availability of the data. This project will provide you with hands-on experience in designing and implementing robust security measures for a database system.

Project Requirements: (Group project: 4 members in a group)

You may choose one of the topics from the given list for your Database project in MySQL

Topics are: College Management database, Students Exam Management database, Student Record database, Employee Record database, Chronic Care Management system database, Airways database, Carpet House database, Movie Ticket Booking database, Library System database, Retail Store database, Doctor's Clinic database, Auto Part database, Vet's Clinic database, School System database, Music CD collection database, Hotel management database, E-Ticket database, Electricity Bill payment database, USPS services database management for Massachusetts database, Online Passport Automation System database, Blood Donation Management system database, Liquor Distributor database, Inventory Management for a computer hardware retailer, and Bus reservation database management project or may choose different topics of your interest and focus on one of them with the approval of the instructor.

You are required to write a project proposal of about one page with a second page explaining a timeline of when you are starting and when you are finishing the Project.

Again, Instructor should approve proposal before you do it. Submit your project proposal by the due date.

Your Database MUST have the following:

1. Create new Database and apply Enhanced E-R diagrams to relations for the topic you choose using the traditional EER notation.

a. Sample DDL (Figure out a data scheme useful to your chosen business. It should include **at least** 6 tables, each with at least 6 data fields and insert statements)

2. Create tables with entity and relational integrity constraints.

   a. Populate your database with at least 15 entries in the tables

   b. Create validation rules for your tables, including at least one of each of the following:
   - Required field
   - A default value
   - Range of allowed values
   - Collection of allowed values
   - Specific format (e.g. phone number or ZIP code)

   c. Use normalization to decompose anomalous relations to well-structured relations

3. Queries: Create and save advanced level queries at least 8 that might be useful for the database's users and create them in your database using multiple tables.

4. Create multiple views for data entry for at least 4 of the tables.

5. Show the database is maintainable by inserting a new field into one of the data tables, deleting a record, and creating a referential relationship between the two tables.

6. The database should include **at least 7 of the following components**: (with your screenshots, provide which **7** are the ones you have used.)

   i. User Authentication and Authorization
   ii. Access Control
   iii. Data Encryption
   iv. Secure Network Communication
   v. Auditing and Logging
   vi. Database Backup and Recovery
   vii. Intrusion Detection and Prevention
   viii. Security Patch Management
   ix. Secure Data Transfer
   x. Security Training and Best Practices
   xi. Others

Note: You are welcome to add additional tables or fields, add additional security features, use different names, or create different saved queries, forms, or reports feel free to do so, as long as you cover all the objectives given above.

Instructions:

1. Use MySQL Workbench to complete the tasks including EER Diagram.
2. Ensure proper table creation with the specified columns, data types, and constraints.
3. Write SQL queries to retrieve the required information for each query level.
4. Take screenshots of table creation, query, view and test your database to verify the correctness of the results.
5. Prepare a report summarizing the steps taken and the results obtained, including the screenshots.
6. Submit your report along with the SQL script file containing the table creation and query statements.
7. A detailed video demonstration should include all the required components including testing the whole database project as a group.

Note: Pay attention to database security best practices including step 6.

Deliverables

1. Follow the file name convention.
2. Each member of your team must submit the final version of the project and the final submission should include EER diagram, feedbacks, video demo, and final version of your database by the due date in a zip folder.
3. Upload your project on Brightspace on the "projects" tab and follow the instructions. **No late projects accepted.** Late projects will not be graded and will not be included in your course grade so organize your schedule accordingly.

Happy Developing!!! ☺