Project: Design Platform Database

Overview

This project is designed to provide you with hands-on experience in solving a real-world problem by designing and developing a database that meets specific requirements. You will apply your knowledge of database design, SQL, and Web programming to create a functional and normalized database.

This project is mandatory and must be completed successfully to qualify for the exam.

⚠ **Note:** If you took this subject last year, you are still required to complete this project.

You will work in **groups of 2 or exceptionally 3** to complete this project. To create the groups, each student needs to fill out following form: https://docs.google.com/forms/d/e/1FAIpQLSegG5YBfWK9i3dYVz5eYgcOmTYC_ItLMfvWcsL6BB-gLFrnXg/viewform?usp=sharing You might either select your team member or ask the course coordinators to create a group. All forms need to be submitted by **midnight Thursday, February 27, 2025**. If you strongly prefer to work in a **group of 3**, then you need to work on an option **b** and your project needs to be larger than the basic requirements (at least 8 tables, at least 8 SQL queries, and at least 20 records per table need to be included) and this needs to be specified in the project proposal.

You are free to choose the type of application you want to develop, but in both cases your solution needs to fulfill given requirements. You can either:

a) Create a **social media platform database** for a Web application. This could involve managing user data, their followers, interests, posts, comments, likes, and other activities

or

b) Develop your **own application**.

You must submit which option you choose (a or b) within two weeks after the project publication (until **midnight Sunday, March 9**) in Canvas. If you choose option **b**, you need to include two paragraphs describing the project of your choice. This proposal needs to be for both options submitted as a pdf in Canvas.

Requirements:

1. Database Design

- Conduct a **problem analysis** to identify key entities and relationships for your Database. Problem analysis needs to be written and available during the project presentation.
- Create an **ER (Entity-Relationship) diagram** to visualize the structure of your database. Diagram need to be available during the project presentation.
- Your database must include **5 or more tables** with meaningful relationships between them.
- Define **primary and foreign keys** and ensure proper normalization up to the **3rd Normal Form (3NF)** to maintain data integrity and avoid redundancy.
- Populate your database with sample data (at least **10 records per table**).

2. Web Application

- Build a simple Web interface to interact with your database.
- Implement **CRUD functionality (Create, Read, Update, Delete)** for at least **2 key entities**.
- You can use **Flask** and **Flask templates** to develop the application. If you want to use other framework or tools, this needs to be specified in the project proposal.

NOTE: If you haven't yet passed DAT310 (Web programming), you may create a simple Python based application. In this case you need to ask for an approval within two weeks after the project publication, regardless of whether you choose option **a** or **b**. Describe your planned solution in two paragraphs in the proposal.

3. SQL Queries

- All SQL queries must be written manually **without using any migration tools**.
- You can decide whether you want to use **SQLite** or **MySQL** for the database.
- Include the following SQL queries:
    - At least **2 different joins** between multiple tables.
    - Aggregation query (e.g., averages, totals, counts).
    - Search/filter operations: Allow users to retrieve specific records based on user-defined criteria, such as filtering by **date range**, **category** or **status**.
    - A query using grouping (e.g., GROUP BY).

4. Presentation

- Present your project in **5-7-minutes** (+2-3 minutes for questions), showcasing:

- Your database schema and design of the normalized table. The problem analysis, ER diagram and normalization analysis must be included in the presentation or at least be available during the presentation.
- **SQL queries**. Show your queries and explain their functionality
- Your running database and **Web application** functionality.

Presentations:

- All group members must be present and participate equally during the presentation, explaining their respective parts.
- All presentations will take place on week 17 during the Thursday, April 24 and Friday, April 25 classes. If you are not available on either of these days, contact Munira Mahammed Seedow at least two weeks before the presentations.
- You will need to sign up for particular time slot of the presentation during these two days. Details of this sign up will be published later in the semester.

Timeline:

- Thursday, February 27, 2025: Fill out the form to form a group
- Sunday, March 9, 2025: Submit the project proposal
- Thursday, April 24 and Friday, April 25: Presentations