CS 665 Project 1: An Application that Uses Database Services

General Description

In this project, you and your group members will develop a desktop/web application that uses relational databases. NoSQL or XML databases are not allowed as they do not reflect the database relations we've covered in this class. This is a group project, and it is OK if you choose to complete it solo.

It is recommended that you choose from popular database software such as 1) SQL Server Express, 2) MySQL, 3) SQLite, etc.

Group Formation

Please use the file "Project Group Formation" on MS Teams to form groups. The file will remain editable only for a limited time so please add your group info without delay. TA will follow the group information from the file to form groups on Blackboard.

The group size should be 1 – 3 students. Undergraduates can team up with graduate students.

Database Requirements (50% of the project weight)

Please propose a database to model some mock businesses, for example, Bike rentals, community libraries, Employee Management systems, and Service Billing software.

- The database should have at least 4 tables, where each table is in 3NF.
- Each table should have at least 4 fields (including primary keys)
- Need to list FDs for each table.
- Also please specify triggers and policies on foreign key constraints.

The group needs to write SQL statements to create all tables.

Once created, please use SQL statements to populate each table by placing at least 5 rows of data.

Please also have SQL statements to perform CRUD (please place them into another file.)

Application Requirements (20%)

Each team may choose their own programming languages/frameworks to build a GUI application for your database. The app should serve as a simple front end to perform CRUD on your database. Also have some predefined SQL statements (such as SQL performing join on multiple tables and subqueries) into buttons to display the result from your database.
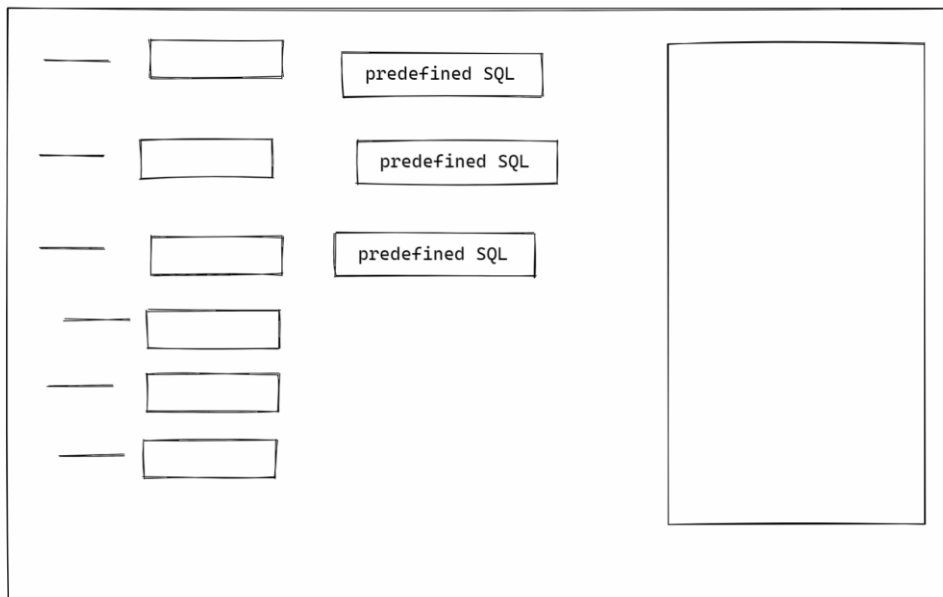
Git Requirements (20%)

Please create a private GitHub repository for this project. Each group member should do a sufficient share of the work, such as having at least two git commits toward the project. Each commit should make non-trivial contributions, such as adding handlers to buttons and writing several SQL statements. Fixing typos in docs is important but should be considered only trivial.

You do not need to invite the instructor or TAs to your private repository. Please explain each important commit (by viewing the commit content) when making the required project video.

Submission Requirements (10%)

Submission will be done through Blackboard. Please prepare the following files:

1. **db_description.md**; A description of your database, including tables, attributes, primary keys, foreign keys, foreign key constraints, FDs, whether in 3NF, and one or two rows of sample data for each table.
2. **create_sql.md**; the file to have SQL statements to create all tables.
3. **insert_sql.md**; the file to have SQL statements to populate tables.
4. **crud_sql.md;** the file to perform CRUD using SQL.
5. **readme.md;**
   - member's GitHub IDs and names
   - **(IMPORTANT)** the link to your project's demo **video** (unlisted/public on YouTube). Please explain the following points in your video:
     - General description of your database, including the choice of DB software (e.g., SQLite)
     - Team members and each one's contribution.
     - GitHub commits by each member.
     - Demo of your application.
6. **A zipped file** for your source code (e.g., VS solution) folder. Note that please delete large-size folders such as bin/temp/debug. The zip file should be less than 20 MB.

Each group will make one group submission on Blackboard.

Due in two weeks. Please find the exact deadline on Blackboard. One-week extension is possible, but please try to complete all required work within the first two weeks.