

CS425 - Spring 2023 - Course Project

Database organization

<<select a DB application from a pool of topics uploaded on the Blackboard>>

Gerald Balekaki

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1 Project Timeline

The project consists of Four (4) deliverables. Deadlines are also announced on the course blackboard (BB). This is a group project and must not exceed 4 members. Each group will demonstrate their application at the end of the semester. Every member of the group must contribute to each phase of the project, and you will be graded based on your individual contribution and on the overall project result.

The deliverables are:

1st Deliverable (Conceptual model) – deadline 13th March 2023

Create a conceptual model consisting of the most essential information required for the selected application. Explore the website of the selected application to identify the relevant data, relationships, semantics, constraints, users, and users' needs, and interesting use cases. Represent the conceptual model using the Entity relationship - Diagram (ERD) showing the most important entities and relationships.

2nd Deliverable (Logical model) – deadline 27th March 2023

Develop a detailed ER-model for the application. Translate the conceptual model into a detailed logical model showing relational schema with appropriate data type, primary keys, foreign keys, and any constraints. You are required to present a detailed ERD and logical structure/schema of the database.

3rd Deliverable (Physical model) – deadline 3rd April 2023

Implement the logical model using a suitable relational DBMS. Create the database in the database system using general Data-definition language (DDL) statements. Load mock data (using free online data generator tools) into the database to test a variety of SQL commands.

4th Deliverable (Application) – deadline 24th April 2023

The last deliverable requires to write a program in any programming language SQL supports and implement a variety of SQL commands. Extra points will be awarded to a group that tests a variety of challenging SQL usage (such as set operations, aggregate functions, set membership, set comparison, subqueries using WITH clause, etc.). Further, interesting use cases that can be evaluated with sample queries will earn extra points. The application can either be web or desktop application and must be demonstrated on the due date.

2 Overview

The goal is to build an application that uses a database backend. Explore the official website, identify essential information to store in the database. Create the database and load mock data to support a wide range of SQL queries. The application should support a basic interface, Create, Read, Update, and Delete (CRUD) operations, and test several use cases identified for the database application.

3 Database Requirements

3.1 Users

Clearly identify the type of users for the database application selected for this project and describe the role of each user.

3.2 Data, relationships, and constraints

Identify the type of data, data relationships, data semantics, and any constraints to be considered during the database creation. Clearly describe each of these design aspects considered for your database application.

3.3 Use cases

Identify and clearly describe the database use cases the need to be tested using the application. Develop sample queries that are suitable to test each use case.

4 Application Requirements

The application should support the following features:

- A user-friendly interface that allows users to connect to the database.
- Basic CRUD operations (such as add/delete/modify records), and complex sample queries (such as set operations, aggregate functions, set membership, set comparison, subqueries using WITH clause, etc.).
- Test a variety of use cases identified for the selected application.
 - These may include search and browse products/services, put products into a shopping cart, place an order, compute relevant analytics, etc.

Submission Instructions:

You are required to zip all your working files and folders in a single folder to be submitted under a submission link provided under the assignment tab on the course blackboard.

END