CS 257 Database and Information Systems Lab
Aug-Nov 2021
Lab Assignment 5: Designing Database Application
Marks: 100
This assignment can be done in groups.
Start Date: 06.10.2021
Submission Deadline: 13.10.2021 10:00 am

NOTE: For late submissions, 10% is deducted for each day late after an assignment is due.

1. Overview

In this project you will learn how to design a web based application to allow users interact with databases in a user-friendly manner. Your application will have a web based user interface at the frontend, and will have an interface with a database at the backend. This application is quite useful for the whole IIT Indore community. We will try to host the best project on IIT Indore website and give due credits to the students who design the application. There is no constraint on which tools or programming language you use. We are only interested in the end-product that you deliver. You should design your application in such a way that it has good performance, secure, user-friendly and attractive looking.

2. Getting Started

AIM: Design and implement a web-based system to record the courses that have been (or are being) taught by the faculties in IIT Indore. You should not store unnecessary information such as information about students, course pre-requisites, department budget, etc. You should create a new ER diagram which stores only the information that is relevant for your specific application. Following are some sample queries that a user should be able to perform without having to do any login or authorization (You might use captchas to avoid internet bots).

a. Find all the courses that were taught by Prof. X from Department Y during Fall 2011 to Fall 2021

b. Find all the different courses that have been taught by Prof. X from Department Y.

c. List all the courses that have been offered by the CSE department between Fall 2011 till Fall 2020.

d. Find all the faculties who have taught Course Z of Department Y.

e. Summary view of all the courses offered in Autumn 2020 (show information such faculty name, room number, course timings, etc.) (This query is most important) f.

You can add your own list of interesting queries.

Example: To form query 1 the user would do the following:

1. Select a department name from a list of displayed department names.
2. Your system should show to the user all the faculties from the selected department. Let the user select one faculty name.
3. Allow the user to select a time range. If the user does not specify time range then it becomes equivalent to query 2.

You should use the above provided information to create a SQL query to get the relevant information from the database and display it to the user. The reason we recommend using department as the first filter is to reduce the number of faculty name that is shown to the user. A more advanced option would be to allow the user to type in the faculty name as text and even if there are some spelling errors, you recommend who are the most likely faculties who might match the user's query based on some edit distance measure. You can also use auto-completion to suggest faculty or department name to the user. Think about similar interfaces for other queries.

Use HTML form to allow faculties and admin staff to add course information, such as:

1. Faculty name (Dr. XYZ)
2. Course ID (CS 207)
3. Course Title (Database and Information Systems)
4. Year (2021)
5. Semester (Autumn)
6. Number of registered students (86)
7. Course timings with room numbers
   · Monday 11:00 – 11:50 am, L01
   · Tuesday 10:00 – 10:50 am, L01
   · Thursday 11:00 – 11:50 am, L01

Users should be able to edit their previously added entries. Allow data insertion or editing using login or authorization (OPTIONAL). To add data in bulk, you can create a CSV file having all the information and insert it to the database. We will test your system by inserting and editing few records through HTML form. Your system should not allow adding a course detail that has conflicting schedule.

3. What to Submit

1. **ER Diagram [Marks: 10+10]:** Build an ER model for the course timetable database. Your design should model the real-world requirements of IIT Indore as closely as possible. For example, you can think of how to include support for fractal curriculum.

Design it in such a way that it can be later on extended to include other types of information such as list of registered students, course conflicts based on registered students, etc.

   a. Create ER diagram using tools such as Dia, Erwin, Gliffy, MySQL Workbench, etc.

   b. Integrity constraints that you have enforced.

2. Relational Schemas [Marks: 10+10]: Reduce your ER diagram to a set of relational schemas. Specify all primary key, foreign key and other integrity constraints clearly. **3. Web Application [Marks: 10+50]:** Implement a simple website with a HTML interface that can be used by IIT Indore faculties, students and admin staff. Make sure that your interface is attractive.

For task 1-2, you should submit one pdf file. For task 3, create a zip file containing all your code and data. Create a top-level zip file containing the above pdf and zip file, and also add a readme file containing names of your team members and instructions on how to run your code. You should name your file as your **roll_numbers&GropuID.zip.** Please upload this **only one zip file** through Google Classroom.