CS355 Project
Autumn 2019

Final Checkpoint: ~~Thur Nov 14, 2019~~ Fri Nov 15 2019 (Submission Filename: ~~FinalReport.pdf~~
Final.zip Should include a docker compatible yml file, necessary PHP and SQL files, README
file, one page description of your project)
(demo on 14th Nov)
Checkpoint 2: Thur Nov 7, 2019 (Submission Filename: Progress2.pdf)
(relational design, user interfaces and their features)
Checkpoint 1: Thur Oct 31, 2019 (Submission Filename: Progress1.pdf)
(E-R diagram: prepare using any standard tool like power point or word or equivalent)

Goal: The goal of this project is to provide a realistic experience in the conceptual design, logical design, implementation, operation, and maintenance of a relational database and associated applications. First the application will be described, and then the categories of requirements, and then some suggestions on how deeply you need to go in each category. This project will be carried out individually over several weeks.

The project can go well beyond the minimal requirements. I encourage such extensions. They could turn into a senior design project or other independent work.

Application description: In IIT Patna, it has been decided to redesign a major part of the database that requires maintaining the publication and project related details of the faculties. Following are some of the requirements.

Faculty: Each faculty is required to upload their publication and project related details.

Publication: Each publication can be of two types – conference publication and journal publication.
One sample conference publication entry may look like

Sumit Mishra, Sriparna Saha and Samrat mondal: "On Evaluation of Entity Matching Techniques for Bibliographic Database", ICACCI 2018, pages 2325-2331, Sep 2018

One sample journal entry may look like as follows

Nilotpal Chakraborty, Arijit Mondal and Samrat Mondal: "Intelligent Scheduling of Therostatic Devices for Efficient Energy Management in Smart Grid", IEEE Transaction on Industrial Informatics, Vol- 13, No-6, pages 2899-2910, Year 2017

Project: Each faculty is required to upload their project details. The project is typically funded by a sponsoring agency. The funding amount is also required to be maintained in the database.

One sample entry of the project is

Development of Planning and Designing Tool for Smartly Adopting Electric Vehicles in Indian Cities, Science & Engineering Research Board, Samrat Mondal (PI), Arijit Mondal (Co-PI) and Jimson Mathew (Co-PI), Budget: 57.42 Lakhs

Data Generation: You can create some sample data from the faculty webpages.

Client Requests:

E-R Model
> •Construct an E-R diagram representing the conceptual design of the database.
> •Be sure to identify primary keys, relationship cardinalities, etc.

Relational Model
- After creating an initial relational design from your E-R design, refine it based on the principles of relational design.
- Create the relations using MySQL database.
- Create the constraints as appropriate. If as you refine your design, you discover flaws in the E-R design, go back and update it
- Your final E-R design must be consistent with your relational design.
- As all the potential users, may not be aware of MySQL queries, so you need to create the web interface for interacting with the database. For this purpose, you may take help of PHP.

Populate Relations
> • Include enough data to make answers to your queries interesting and nontrivial for test purposes.
> • You may find it helpful to write a program to generate test data.

Queries:
You should run a number of test queries to see that you have loaded your database in the way you intended. The queries listed below are few of those that your client may want. They may provide further hints about database design, so think about them at the outset of the project.

- Show the trends of publications for various faculties over the past 3 years, by year. Then break these data out by their research area.
- Collaboration indicates when a faculty publishes a paper with another faculty. Show the collaboration trends of a faculty
- Find the total project fund received by CS Department faculties in a particular year
- Try to detect some inconsistency in the database. Users may make mistake while entering data. For example: project fund value entered by two faculties may mismatch. Try to figure out such inconsistency.