CS 122a: Project Description

Project goals:

Over the course of this project, students will build an information systems application that is built using a database system. Students will be involved in all phases of the information system realization, starting with the requirements provided, generating an appropriate conceptual design meeting the requirements, translating the conceptual design to logical (relation) database design, all the way to actual creation of relational tables, database population with representative data, and finally querying and manipulation of the database.

Project details:

Information System Requirements

Consider a university enrollment information system. The university enrollment system maintains information about students, courses, schedule, and enrollment information. The system also maintains the grades that are awarded to the students. Students are represented using a name, current major, gender and advisor, who is a faculty member of a particular department. Each course has the following information: a course identifier, department, course name and units. A faculty member has a name, a department for which he/she works for and takes a set of courses during the course of the year. The enrollment system also maintains schedule information which contains courses taught by all the professors belonging to all the departments of the university.

The above requirements description has been left deliberately incomplete. The tasks in this project are:

(i) Complete requirements provided

    a. For instance we have not provided any constraints in the description but clearly some constraints (and perhaps dependencies) may be useful in such a scenario. We may also need to update some data later. Come up with some such constraints, dependencies etc.

(ii) Generate a conceptual design i.e., an ER diagram reflecting the requirements

(iii) Generate a relational database design based on the above conceptual design

(iv) Create and actually test (show runs on MySQL) SQL DDL statements to create tables and load data

(v) Create and evaluate SQL queries to retrieve and manipulate data.

Data Querying and Manipulation

Now the objective is to come up with an application, which will provide the user following functionality:

1   Find all the faculty members that taught a particular course.
2   Find out how a particular student performed in a course offered in a certain year.
3   Find the average grade point average for a particular course. Specifically, list all the grade point averages of a course offered multiple during a calendar year.
4   Find the average enrollment for all courses offered by a department for a certain year.
5   Find the percentage of female students belonging to a particular department taking a certain course.
6   Cancel a particular course that is offered

Submission 1: Design

 50% of the total project grade. Due Nov 10, 2006

Submit the ER-model of the University enrollment system, its corresponding relational schema, and the SQL DDL statements that generate the relational schema, either in a hardcopy or electronically to the grader of CS122a. The conceptual design will be evaluated using the ER-design principles explained in class (see slides02.ppt). Include a short description explaining some of your design choices and why you think they are appropriate. You could use tools like Microsoft Visio/Word or others for ER-modeling. The final electronic submission of the design should be in pdf format. Remember, no late submissions, so get started early.

Submission 2: Final Application.

50% of the total project grade. Due Dec 6, 2006.

Submit the final project electronically to the grader. The final application should have a simple interface providing the users with the functionality described above. The evaluation of this submission will be purely based on the functionality. Also, include a readme.txt explaining the usage of the system and the functionality the system provides. No late submissions are allowed.