CIS560 Class Project – Database Application

Database design assignment due: October 4th

Remember that the general goal of the class project is to build a database-driven web information system. Specific goals include:

1. Finding an application for which database systems would be required
2. Modeling the domain of the application, and defining the application functionalities
3. Designing and implementing the schema in MySql
4. Populating the database, writing interactive queries and modifications on the database, exploring other aspects such as constraints and triggers
5. Writing interactive queries and modifications on the database.
6. Writing the code needed to embed the database system in the application

The proposals were meant to get you to start thinking about the project and create a plan. As our initial goal was achieved, we are now moving to the next few steps.

Note: If there were any issues with the English description of your database application, your first task is to revise the description.

In this project assignment, you will perform more thorough database design. The specific requirements are:

a. Specify an E/R diagram for your proposed database. Don't forget to underline key attributes for entity sets and include arrowheads indicating the multiplicity of relationship sets. If there are weak entity sets or "is-a" relationships, make sure to mark them appropriately.

b. Using the method for translating an E/R diagram to relations, produce a set of relations for your database. Be sure to underline key attributes in your relations and also specify foreign keys.

c. For each relation in your schema, specify a set of nontrivial functional dependencies for the relation. Any functional dependencies that actually hold in the real-world scenario that you're modeling should be specified, or should follow from the specified dependencies. *Don't worry if you find that some of your relations have no nontrivial functional dependencies.*

d. Is each relation in your schema in Boyce-Codd Normal Form (BCNF) with respect to the functional dependencies you specified? If not, decompose the relation into smaller relations so that each relation is in BCNF. Make sure you underline key attributes in your new relations. Are all functional dependencies preserved? If not, you may need to settle down for the 3rd

Normal Form (3ND). *Don't worry if you don't have any BCNF violations - many small databases will not have any.*

e. Is there anything you still don't like about the schema (e.g., attribute names, relation structure, etc.)? If so, modify the relational schema accordingly. You will be working with this schema quite a bit, so it's worth spending some time to make sure you are happy with it.

You should turn in a small report containing the following (submit your report using the course Dropbox):

1. Your E/R diagram and a short description in words for parts of the E/R diagram whose meaning is not completely obvious from the diagram itself, if any (a. above)
2. Relational schema and functional dependencies (b. and c.)
3. A description of any problems you might have encountered in the process and how you have addressed such problems.
4. A short note about how your team has worked together on this assignment, and problems you have encountered, if any.

Acknowledgments: The project has been adapted from similar projects required for courses on database systems offered by Arthur Keller at UCSC.