Lab 2: Database requirements analysis and design

Due date: Tuesday, January 29, 4:00pm.

This is a **group lab**. Each group submits one set of deliverables. Each group member receives the same grade for the assignment.

Lab Overview

This lab includes three assignments.

- Populate project wiki with information provided to you by the customer.
- Revisit your Lab 2 design submission and improve it to take instructor comments, and unsatisfied customer requirements into account.
- Prepare the relational database schema for your design.

Assignment

Project Wiki

We have created a project wiki for the course. The wiki is accessible from the course web page. The direct URL is

http://wiki.csc.calpoly.edu/cs366-2008

The wiki will be used to store various information about the project and is designed to be a one-stop destination if you need questions concerning the project answered. All documentation made available by the customer will be put there by the instructor.

In addition, you are tasked with documenting the Thursday's Q&A session with the customer, as well as any other information you found from the customer in the course of Lab 2.

Assignment. Each group is responsible for documenting the answers to the questions, the group has asked on January 17. You have created a list of questions and some groups provided short answers in their Lab 2 submissions. These need to be put into the wiki and expanded. Each group is only responsible for putting answers to the questions the group actually asked. However, you are also welcome to edit (add, update) information about other questions.

Please try to organize the information about the project thematically, rather than by group. You should not create "Questions asked by group X" wiki pages. Rather, create "Questions about topic Y" wiki pages, and put your questions and answers there. There are two major categories of questions: *database-related* questions and *software-related* questions. Most of your questions at this point will fall into the first category, Lab 4 will provide content for the second. Within the subcategories, the breakdown is more straightforward: database-related questions are broken by the entity sets they relate to and any associations they might have.

The base structure has been created, it is your task to populate it.

Feel free to add new wiki pages if you deem them necessary. Also, you are encouraged to crosslist and link related pieces of information in the wiki.

Database Redesign

Each team will receive their initial design document marked with comments of the instructor, but not graded. Additional comments can come from the customer at a later time.

Each team shall prepare a revised design document. The document shall contain a revised version of your Entity-Relationship model. It shall include any information requested in Lab 2, but missing in the submission. It shall include requested information in exactly the specified format. Some additional information (see below) shall also be included in the redesign. The redesign shall contain:

- List of entity sets for the proposed database. For each entity set, it must be specified whether it is strong or weak.
- List of attributes for each proposed entity set. For each attribute, its type must be indicated[1].
- Identification of primary keys for each proposed strong entity set. Identification of discriminating attrbiutes for each proposed weak entity set.
- Identification of any other entity set constraints for the proposed entity sets.

[1] You may use either SQL types, or simple type specifications like string, boolean, integer, etc.

- **(Please, read this set of instructions carefully!)**List of relationship sets for the proposed database. For each relationship set, the following must be indicated:
  - All participating enitity sets.
  - All descriptive relationship set attributes.
  - Type of the relationship set (one-to-one, one-to-many, many-to-many).
- List of other relationship set constraints.
- **Simplified** E-R diagram of the proposed database design. The E-R diagram shall contain
  - all entity sets.
  - all relationship sets, properly connected to the participating entity sets.
  - all primary key attributes of strong entity sets, all discriminating attributes for weak entity sets.
  - all descriptive attributes of relationship sets.
  - all constraints that can be shown on the diagram (multiplicity, participation, referential integrity).

The design document must be typeset (handwritten submissions will not be accepted). The E-R diagram shall be designed using drawing software. (if you are using Windows, you can use MS Powerpoint; if you are using Linux, CS labs have xfig, which allows exporting designed diagrams into .eps (Encapsulated Postscript) format).

The design document shall begin with the name of the group, and the list of group members. Note, that in general, **all documents** submitted by each team during the course of the project must contain the team name and the list of students. (and so shall all code written for the project).

Change Log

To simplify grading, and to simplify tracking the changes in your design, each team shall compile a changelog document. This document shall include the following:

- List of specific changes in the design of the database.
- List of responses to any instructor's comments on your Lab 2 submission, which were not addressed by the redesign (e.g., you believe that your original design already does what was needed).

Logical Database Design

Based on your E-R model redesign, each group shall prepare the initial logical database design.

The logical database design is the relational database schema obtained from your E-R diagram. Each group shall prepare the following:

- Database description, which consists of the following information:
  1. List of relational tables in the database.
  2. For each relational table, list of all attributes.
  3. Identification of primary keys for **all** tables.
  4. Identification of any foreign keys (this can be done on separate lines, in the form, `"Attributes X, Y, Z are of foreign key onto table R"`.
  5. Specification of any constraints on the database that cannot be preserved in the database schema, but must be kept track of by the software.
- SQL DDL commands creating the database.

Submission Instructions

You need to submit the following:

1. Your **original** Lab 2 submission. I will be using my comments to your Lab 2 submission to judge your Lab 3 submission.
2. Hardcopy of the redesign document.
3. Hardcopy of the change log.
4. Hardcopy of the logical database design document, which includes DDL commands.
5. Electronic copy of the DDL commands. Name the file `DB-setup.sql`. Email the file to dekhtyar@csc.calpoly.edu prior to the submission deadline. (Note: I will run your DDL commands, they must work, the database must be created!)

All hardcopy materials should be submitted together at the end of the Tuesday, January 29 lab period (P.S. submissions will be accepted without penalty until the end of the office hours at 4pm. If submitting after the lab period is over, please bring the submission to my office at 14-215).

Please, keep the soft copies of all submitted documents. You will be working with them in the labs that follow.