Requirement Outline for CSC4402 Project

Fall 2016

1. The CSC4402 project is a group project. The students should form groups each of which consists of 8 to 10 members. Each group will work as an entity to produce one final result for the project. While the corporation among members **within** a group is encouraged, each group should work **independently** - **NO** collaboration between groups is allowed.

   The instructor of the CSC4402 class will help each group in database design and various stages of your project, if needed. Feel free to make an appointment with the instructor for a group meeting/consultation.

2. The task for the project is to design and implement a relational database application for a suitable (real world or prototype) application domain. The implementation will be done on the Classes server using a relational database system MYSQL, or any other relational database system if the group project builds applications with GUI that access the database via the Web.

3. Roughly speaking, the project will involve several stages of development:

   (a) Interview the people in the real world application domain to figure out the nature of the application, the entities important to the application, the specific attributes to be stored in the database, the relationship among the entities (and among the attributes), the constraints imposed on the database (attributes) by the nature of applications, the assumptions made by the database designer. The result of this step should be an entity-relationship model (E-R diagram) of the application, plus a list of constraints and assumptions.

   (b) Design the database - decide the table structures of the database: How many tables should we have? What are the attributes (columns) in each table? What are the primary key and the foreign keys? Whether the tables are in some desired normal form? The theory of logical design of relational databases will be used in this phase. The result of this step should be in the form of table schemes (relational schemes) such that each table is in some desired normal form.

   (c) Create the database, gather sample data and insert them to the database. Design queries and implement them using SQL.

   (d) Write up a report, describing the above process (a) - (c), including the script of program execution and program source code, with appropriate documentations.

   (e) Give an oral presentation on your group project to the entire class. It is expected that every member of the group will participate in the presentation.

4. The database designed should contain at least 4 to 5 tables, each with a few columns. The database should have a reasonably rich structure (many-to-many relationship) to allow interesting queries. Each table should have at least 10 - 15 records, and for those tables which represent a many-to-many relationship, you should give at least 25 - 35 records, because otherwise most of your queries will return no records.

   Your project should include 10-15 SQL "select" queries. You should try to design interesting queries to utilize the SQL skills (join queries, sub-queries, use of "group by" and

aggregation functions, etc.) learned in the class! You should also include 4-5 update SQL statements in your project.

5. The written project report should consists of two parts: (1) The database design part; and (2) The implementation part. The database design part should give a reasonable description about the application domain, then show your analysis of the domain, and show your E-R diagram, list the identified constraints and assumptions about the domain. Further, the report should show your database design process and the result tables. LIst the functional dependencies, the primary key for each table and the foreign keys.

   For the implementation part, the report should first show the data definition statements ("create table"). Then show 2 "insert" statements for each table. (Then you can insert or import all records in your database, but no need to put all of that in the report). After all data is inserted in the database, show all records in each of your tables in the project report (by using "select *" from each table).

   Then the report should show the data manipulation statements ("select" and "update"/"delete"/"insert"). Your project report should include 10-15 SQL "select" queries. You should try to design interesting queries to utilize the SQL skills (join queries, sub-queries, use of "group by" and aggregation functions, etc.) learned in the class! For each "select" query, the report should first show the English statement of the query, then the SQL query should be presented, followed by the screenshot of the resulting records.

   You should also include 4-5 update SQL statements in your project report.

6. If you would like to develop a more complex database application with GUI and Web access, you may use a different computer/database platform. However you should inform the CSC4402 instructor about your choice of platform/project format.