CSE462 Database Concepts
Spring 2000
Project #2
Design and Implement an Application Client to a Database

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1 Introduction

A database usually stores the raw data for an application domain (Ex: student-course information, financial data) in an easily and efficiently accessible form. Its primary purpose is to "serve" the data requested. From the data stored in the database, a "query client" (Ex; a SQL cleint) retrieves the information of interest and delivers it to the user. In this setup all the processing and the intelligence needed to retrieve the appropriate data rests with the query. As you might have noticed in your Project 1 the query about the GPA carries through a considerable amount of transformation before data can be presented as information requested by the user. A design alternative to performing a complex query is to get the raw data into an application and do the processing in the application.

Another problem with the Project 1 model is the redundancy due to the "worksheet's" presence in the database. A third but not so obvious problem is the presentation of the worksheet to the user. For example, what if I had asked you to write SQL statements (assuming thet we know only SQL statements) to display the entire worksheet? Finally how extensible is your data model? What if I aksed you to add Computer Engineering (CEN) program to your model. Can you do this without major redesign? We will try to address some of these issues in this project.

2 Objective

To enable the students to

- Interact with the data base using the Open Database Connectivity (ODBC) standard.
  - Writing an application client.
  - User interface, data retrieval through embedded SQL satements and information (intelligence) generation through data processing are some of the major responsibilities of this application.
- Extend the ER model of Prj1 to include the CEN program the details of which is enclosed.

3 Problem Description

1. (5 points) **Checking out ODBC:** Write a simple application in C (or any variation of it) or in Java that interfaces with your database you created in Project 1, and displays the names of the you created. This is to make sure your ODBC driver can be loaded and successful connection can be established and a SQL statement be executed.

2. (Extra Credit: 25 points)**Extending the ER model:** Extend the existing ER model to include one more program CEN. Make sure you add all the necessaary intergrity constarints. The details of the course requirements for this program is enclosed. Test it using the query "list courses completed by student in CS requirement".

3. (80 points)**Moving Data processing to Application:** Move all the worksheet related data to (your familiar territory) an application program. You may need a Worksheet class and sub classes for BA, BS and CEN, if you are using OO design. Objects of this class will be used to keep the information derived from the database and to populate user interface.

   ```
   user interface <---> Application <---> database
   ```

   The user interface should allow a student user to input new data such as courses completed into the database. It should also display a complete and current worksheet filled with specified student's data. No need for Graphical User Interface.

4. (15 points) Provide external and internal documentation for your application. External documentation will clearly show your design, data structures and algorithms used. It will also include a user's manual that describes how to use your system (application). Internal documentation will contain comments.

4 Material to be Submitted

1. Prepare the document using any of your favorite text processor. Acceptable formats are : .doc (MS-word), .pdf (Adobe-acrobat), .ps (postscript, latex to dvi to ps), .html (html composer), .text (plain old text).

   Pay attention to grammar, spelling etc. Prepare a professional solution so that it could become a part of job search dossier.

2. Submit on-line, along with a README file that gives details on how to read your document.

3. All the database related files should be submitted.

5 Due Date

3/29/2000 by mid-night.