CSC 261/461 Introduction to Databases

Milestone 3

Introduction

This milestone has both theoretical and application components. In the *first part*, you will list the functional dependencies present in all the relations (or tables) of your database. Then you will convert the database relations into BCNF (Boyce–Codd normal form), if the relations are not in BCNF already.

For the *second part*, you will work on mostly HTML and PHP + SQL. This is the first time you will share your database with the whole world (or at least with everyone in UofR). In this last milestone, you will transform the logical design of your database into a physical design. You will populate your tables and provide us 'real' interfaces for interacting with the database.

Task A: BCNF Normalization

A relational schema R is in Boyce–Codd normal form if and only if for every one of its dependencies $X \rightarrow Y$, at least one of the following conditions hold:

- $X \rightarrow Y$ is a trivial functional dependency ($Y \subseteq X$)
- X is a key for schema/relation/table R

For this milestone, you need to make sure all of your relations are in Boyce-Codd normal form. List the functional dependencies for each relation. Decompose the relations properly, if the tables are not in BCNF. After the decomposition, all the resultant relations should be in BCNF.

If you decide to keep a particular relation in 3NF instead of BCNF, justify the decision. (Hint: Lossless and/or Dependency preserving decomposition). Submit TaskA.pdf which contains the details of the transformation from the initial schema to the final schema where all the relations are in BCNF. This file should also contain all the functional dependencies you have started with. Note: It is quite possible that your initial schema is already in BCNF and in that case you just need to list the functional

dependencies and show that the relations are already in BCNF.

Task B: Create forms using HTML

In Milestone 1, you gave us your web-interface as images. This time you will create your interface as HTML files.

Provide us a list of HTML files for the interface. These interfaces are mostly used for collecting input from the users. This task does not require any PHP coding or database connectivity. We are only interested in the interface. You may additionally want to add css files for styling, and javascript files for input validation, if required.

Include all the html, css, javascript (if any) files in the directory taskB.

Task C: Creating and loading relations

In Milestone 2, you have designed the relations (table) required for your project. For this milestone, you will create the actual relations. Create a file create.sql that will create all the tables in your database. Load these relations from data files (tab or comma separated files). The tab or comma separated files can be created by you (dummy values) or you can provide the sources. Create a load.sql file for bulk loading. Create a readme.txt file that states the source of your data.

Put create.sql, load.sql, all the .dat files (or .csv files, or data files in any other format) and a readme.txt file into a directory taskC.

(Note: create.sql and load.sql files should have the table structure as defined in the previous milestones)

Task D: Accessing the relations from Web

For Task D, all we need is an address of a web page on Betaweb server. The webpage you create should contain links to view the content of each relation/table you created in Task C. In addition, the user should be able to perform a search/insert/update/delete operation on the tables, based on their access permissions.

Save the address of the web page as taskD.txt. This file should also contain a brief description of contributions made by each member. We expect to see an even

distribution of the workload.
If you decided to develop your application in your own computer, you will have to show us the webpages whenever required.

Submission instructions

Create a new directory milestone3. Copy file taskA.pdf, directory taskB, directory taskC, and taskD.txt to milestone3. Compress the folder as milestone3.zip.
Submit the zip file on BB as usually.
(*) Note: One submission of the compressed file per group is sufficient.

Important Note on Grading

This milestone will be graded based on the quality of the group submission.
We reserve the right to give extra points up to a maximum of 20% for submissions that go above and beyond the requirements with respect to: user interface, styling, functionalities of the code, etc.

Acknowledgment

Contents of this handout adapted from a previous version of the project for this course by Tamal Biswas.