

PROJECT #1 (MILESTONE 3)

CSC 261/461 (Database Systems), Spring 2018,
University of Rochester

Due Date: 04/05/2018 (11:59 pm)

Introduction

This milestone has both theoretical and application components. In the first part, you will provide us the functional dependencies present in all the relations (or tables) that you are using. Then you will convert these 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 penultimate 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 superkey for schema/relation/table R

For this milestone, you need to make sure all of your relations are in Boyce-Codd normal form. Provide us a list of dependencies for each relation. Decompose them 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: This is quite possible that your initial schema is already in BCNF and in that case you just need to provide us the functional dependencies and convince us 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 provide these 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.

- CSS and Javascript are not mandatory for this milestone. But for the last milestone, your interface should have a good look and all the entries should be validated. So, it is better to start with CSS and Javascript now than later.
- Some of these HTML files might be incomplete and that’s ok. Especially, all the files those you want to be populated from the databases might be empty. Just put a note stating that you will do so later.

Put all the `html`, `css`, `javascript` (if any) files into a directory `taskB`.

Task C: Creating and loading relations

In Milestone 2, you have designed the relations (table) those are required for your project. For this milestone, you will create the actual relations. Create a file `create.sql` which 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 which 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 same structure as in Project 2 Part 1)

Task D: Accessing the relations from Web

For Task D, all we need is an address of a web page on Betaweb server. This webpage should contain links to view the content of each relation/table you made in Task C.

For example, If your project had the four relations that we used for Project 2, you would provide us a link which resembles: `http://betaweb.csug.rochester.edu/~tbiswas2/class_demo/q8/show_relations.html`.

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 would like to see an even distribution of workload.

Submission instructions

Create a new directory `milestone3`. Copy file `taskA.pdf`, directory `taskB`, directory `taskC`, and `taskD.txt` to `milestone3`. Archive (tar) the folder as `milestone3.tar`.

```
mkdir milestone3
cp taskA.pdf milestone3/
cp -r taskB milestone3/
cp -r taskC milestone3/
cp taskD.txt milestone3/
tar -cvf milestone3.tar milestone3
```

Submit the tar file using the command:

```
~csc261/submit p1m3 milestone3.tar
```

You should get a feedback whether the submission is successful or not.

You may resubmit as many times as you like; however, only the latest submission (along with the timestamp) will be saved, and we will use your latest submission for grading your work. Submissions via email will not be accepted! No late submissions allowed.

You must adhere to the naming guideline to avoid losing points.