

Draft

CS 586 Winter 2012 Graduate Student Assignment
to be completed individually or in teams of two students

Preliminary idea for project: due on Tuesday, February 7
in-person meeting with Dr. Delcambre

Intermediate design and about 50% of the implementation: due on Tuesday, February 21

Project due: on Tuesday, March 6

Choose one of the following projects:

1. Design a database, issue the appropriate create table statements in PostgreSQL, and populate your tables with sufficient data, and then write SQL queries against your database.

The database will be used to teach SQL to future database classes. Thus the application area that you choose must be understandable and hopefully interesting to a broad range of people.

The schema for your database should be of medium complexity; you should have 10 or so tables with a mix of one-to-many and many-to-many relationships (represented by the appropriate foreign keys in your tables). Perhaps you could also have a one-to-one relationship, as well.

Your data must be realistic and complex enough so that the query answers for the majority of your sample queries have non-empty answers. (The sailors schema is too simple because there is only one many-to-many relationship and the data is too simple because, for example, there are no boats without reservations. The spy database and its accompanying data are too simple because there is little opportunity to use an outer join as opposed to an inner (regular) join and because almost all of the foreign keys use the same name as the key that it references.)

You should have a reasonable number of rows in your tables, e.g., a few dozen rows in the important tables. (The sailors database is too small for some purposes; the spy database is too large for some purposes.) We want to be able to use this database when instructors are teaching and when students are working on their homework assignments.

You must write at least two sample queries for each SQL query feature covered in my lectures. These queries should be realistic for the application area. You must provide the query and the query answer (when run against your database).

The entire package of information (the schema diagram, the CREATE TABLE and INSERT statements, a text file that describes the application and each query and each query answer

must be presented on a series of web pages. The query pages on the web site should be organized according to which SQL feature(s) they use. Each query page should be linked to a page that shows the query answer.

Deliverables: your web site; your database (in the dbclass.cs.pdx.edu PostgreSQL database).

2. Develop a tutorial on how to use SQL while developing an application. You can choose the language and environment that you use; you could choose to develop a tutorial for a web-based application that uses php or some other language, for example. You will also develop a sample application as part of your tutorial. The application should do something of moderate complexity and use queries against your database of moderate complexity. You can develop your sample application against the spy or library database or against a new database that you develop.

Your application should include the ability to search (which means that you will issue a query in your application), browse (e.g., browse by name that start with a particular letter), as well as insert, update, and/or delete data.

Your application should prevent SQL injection attacks and your tutorial should explain what they are and how to be resistant to them.

It is important that you application shows how to use cursors.

The tutorial must be developed as a small website – with pages interlinked as appropriate.

You will also give a lecture – in the 386/586 class – to show the students how to use SQL in your application environment and also to show them how your tutorial works. Your lecture will be given on Tuesday, March 6. (The student's assignment 7 will be to develop a simple application that applies the ideas that you teach them in your tutorial. Your lecture will be in place of your assignment 7.)