Assignment 6 - Databases

Practice questions

These questions are optional and for your practice only. You do not need to submit solution to these questions on courses website.

1. Create table students using sqlite3 for storing student records. You can store roll number, name and email information for each student.
2. Insert records of few students in students table.
3. Display information about student based on roll number.
4. Display information about student based on name.
5. Display information about student based on email address.
6. Display information about student with part of name. For example if students names are Saurabh and Gaurav, and part of name to search is specified as 'aur' then display records for both Saurabh and Gaurav.
7. Display information with part name without taking case (Captial / Small) into account.
8. Delete record of particular student based on roll number
9. Take backup of database in text file containing SQL statements.
10. Restore backup of database in '`test.sqlite3`' database.

Do all the above operations using MySQL and PostgreSQL respectively. You can choose to do the operations from root user or users without password for simplicity. But you must be comfortable in setting up both MySQL and PostgreSQL database on new system from scratch.

Based on time and interest do all SQL exercises mentioned on http://www.sqlzoo.net/ website.

Assignment questions

Since courses website will allow only one file submission, you have to 'tar' programs together and upload the final tar file as solution.

1. Complete the records example which is given as sample. Ensure following while completing the example:

   (a) Do not accept records with same roll numbers for two students.

   (b) Do not accept records with both name / email address empty. At least one among name / email must be present in each record.

   (c) You can save records to file in any format SQL, SQLite3, CSV, XML etc. that you prefer. Read records from file option must support reading from file saved using your program.

   (d) Use the same modular / function based approach in completing the program. Indentation and variable names must be proper in final code. Unindented code or variable names like a, b, c, i, j, k, temp1, temp2, etc. will be penalized.

   (e) The program does not depends on any existing file / database to work. '`initialize_database`' ensures that program can run without assuming anything. The final program that you submit should also be same which does not assumes anything about system.

2. Write program same as in part (1) using MySQL. You must not perform operations using root user. Name of user and name of database should be defined at top like DATABASE is defined in class example. You can use MySQL users which do not require password to login in your program.

   (a) You can assume some MySQL user and some MySQL database already exist on the system. Do not assume anything about tables stored in given database.

   (b) In save and restore / read options you can give user option of saving records in some new table instead of file. If you provide that option then you must also provide option for listing all tables. You can always implement the save and restore functionality using SQLite3 instead of using MySQL.

   (c) All assumptions about pre-existing users and databases must be mentioned in file readme_2.txt. You should also mention CREATE

USER and CREATE DATABASE commands required to created assumed users and databases.

3. Write program same as in part (2) using PostgreSQL. If you face problem with postgreSQL authentication without password, then you can use ident authentication. Same as before all assumptinons and commands required to fullfill those assumptions must be mentioned in file readme_3.txt

Challenge questions

These are for ambitious students only. It is not required for everyone to solve these. You do not have to upload solutions to these questions on courses website:

1. Write programs 2 and 3 with security support. Since shell scripts are open source, you should ask user to enter password every time he/she runs program. The password should then be used to login into MySQL and PostgreSQL databases. Do not echo the password back to user.

   Hint: You can use expect to supply password to mysql and psql command line programs.