CS 405G: Introduction to database systems
Assignment 3

Assigned: Oct. 2, 2013
Due: Oct. 18, 2013

Submission instructions: Please try to prepare the assignment in word document (hand-written homework is also acceptable). Print and bring them to class on the due date. Put the course number and your name at the top left corner of the first page of your homework. Please follow the rules in the course syllabus regarding late homework and plagiarism.

Topics: SQL
Reading assignment: Chapter 5.1 (Book, 6th Edition)

Problem 1 (40 points) The following schemas describe Presidents, Judges and the appointment relationships between them.

Presidents(*PName* : string, *PDateOfBirth* : int, *Party* : string, *HomeState* : string)
Judges(*JName* : string, *JDateOfBirth* : int, *LawSchool* : string)
Appoints(*PName* : string, *JName* : string, *Date* : integer)

Formulate the following queries on these schemas in **SQL** and **Relational Algebra**.

a) Retrieve the names of all the presidents.
b) Retrieve the names of all the judges graduated from Yale or Harvard.
c) Retrieve the names of the presidents who appointed judges from both Yale and Harvard?
d) List the number of judges graduated from each law school.
e) Retrieve the pairs of names of judges attended the same law school
f) What are the political parties whose presidents only appointed judges from Yale
g) What are the names of the presidents who appointed exactly two judges?
h) What are the names of the presidents who never appointed a judge?
i) Retrieve the names of judges that were appointed by more than 2 presidents.
j) List the oldest of judges graduated from each law school appointed by presidents in the Republican Party.

Problem 2 (60 points): Consider the following relational database.
employee *(person-name, street, city)*
works (*person-name, BankID, salary*)
company (*BankID*, company-name, *city*)

The initial database content can be found at
http://protocols.netlab.uky.edu/~liuj/teaching/CS405G_f13/assn/assn3-db.xlsx

Sample php program for connecting a database can be found at
http://protocols.netlab.uky.edu/~liuj/teaching/CS405G_f13/code/

A good tutorial for using SQL and PHP can be found at
http://www.w3schools.com/php/php_mysql_connect.asp

You are required to write an application program with PHP (other programming languages are acceptable) to do the following:

1. Set up the above database tables and initiate the database with the content at MySQL database on the multilab linux machine.

   Note:
   a. The server name is 'mysql.cs.uky.edu'
   b. Your username is your multilab ID.
   c. Your password is Initial passwords are 'u'+last 7 digits of UKID (Example: If UKID=100123456 then initial password is 'u0123456'(without the single quotes) - this is different than campus!!!)
   d. Your database has been created with the same name as your username.

2. Write SQL to conduct the following queries a-i

a) Find the names of all employees who work for First Bank Corporation.
b) Find the names and cities of residence of all employees who work for First Bank Corporation.
c) Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000 per annum.
d) Find the names of all employees in this database who live in the same city as the company for which they work.
e) Assume the companies may be located in several cities. Find all companies located in every city in which First bank is located.
f) Find the employees who work for more than two companies.
g). Give all employees of First Bank Corporation a 10 percent salary raise.
h). Give all employees in this database a 10 percent salary raise, unless the salary would be greater than $100,000. In such cases, give only a 3 percent raise.
i). Delete all tuples in the *works* relation for employees of Small Bank Corporation.