

CS 405G: Introduction to database systems

Assignment 3

Assigned: Feb. 14, 2013

Due: Feb. 26, 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

Problem 1 (60 points): Consider the following relational database.

employee (person-name, street, city)

works (person-name, company-name, salary)

company (company-name, city)

manages (person-name, manager-name)

Write down both relational algebra and SQL to express the following queries a-f:

- Find the names of all employees who work for First Bank Corporation.
- Find the names and cities of residence of all employees who work for First Bank Corporation.
- 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.
- Find the names of all employees in this database who live in the same city as the company for which they work.
- Assume the companies may be located in several cities. Find all companies located in every city in which Small Bank Corporation is located.
- Find the employees who work for more than two companies.

Write down only relational algebra for the queries g-i:

- Give all employees of First Bank Corporation a 10 percent salary raise.
- Give all managers 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.
- Delete all tuples in the *works* relation for employees of Small Bank Corporation.

Problem 2 (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.

- 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.