CSCI 6333/6315 Database Systems

Spring 2020

ASSIGNMENT 1: Introduction and SQL

All answers shall be typed using a word processor and some drawing utilities. A cover page shall be prepared with course title, homework number, submitted date and time, and contact info including your email address.

Due: Midnight, Tuesday, February 4, 2020

1. (100 pts) Consider the insurance database of Fig 1, where the primary keys are underlined. Construct the following SQL queries for this relational database.
    a. Find the total number of people who owned cars that were involved in accidents in 1989.
    b. Find the number of accidents in which the cars belonging to "John Smith" were involved.
    c. Add a new accident to the database; assume any values for required attributes.
    d. Delete the Mazda belonging to "John Smith".
    e. Update the damage amount for the car with license number "AABB2000" in the accident with report number "AR2197" to $3000.

    person(driver-id, name, address)
    car(car-license, model, year)
    accident(report-number, date, location)
    owns(drive-id, car-license)
    participated(driver-id, car-license, report-number, damage amount)

    Figure 1. Insurance database

2. (120) Consider the employee database of Fig. 2, where the primary keys are underlined. Given an SQL query for each of the following questions.
    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 addresses, and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000.
    d. Find all employees in the database who live in the same cities as the companies for which they work.
    e. Find all employees in the database who live in the same cities and on the same streets as do their managers.
    f. Find all employees in the database who do not work for the First Bank Corporation.

g. Find all employees in the database who earn more than each employee of Small Bank Corporation.
h. Assume that the companies may be located in several cities. Find all companies located in every city in which Small Bank Corporation is located.
i. Find all employees who earn more than the average salary of all employees of their company.
j. Find the company that has the most employees.
k. Find the company that has the smallest payroll.
l. Find those companies whose employees earn a higher salary, on average, than the average of First Bank Corporation.

employee(employee-id, employee-name, street, city)
works(employee-id, company-id, salary)
company(company-id, company-name, city)
manages(employee-id, manager-id)

Figure 2. Employee database

Note: For each tuple of the *manages* relation, the manager-id is the manager's employee id.