COMP-421B Database Systems, Winter 2015

Written Assignment 2: SQL

Due date: Feb 24th, 10:00 PM (no late submission!!)

This assignment MUST be submitted as a file that can serve as executable input for DB2 or PostgreSQL. It has to be submitted online to myCourses. The file has to contain an answer SQL query for each of the queries requested. Please order your queries in the proper order.

You are provided below a design of a relational database for a hospital. The database contains information on employees (doctors, nurses, and other staffs), patients, and medical services available, e.g., different departments, different labs in each department, different tests in each lab, number of wards/beds in each department etc. A medical file is opened the first time a patient is admitted to the hospital and updated on every visit or medical test in the hospital. Some information on how this hospital runs:

- Each department will be administrated by a doctor.
- Each department has many doctors, but each doctor work for one department.
- Each patient is assigned to a doctor upon his/her visit/admission.
- Different tests may be required for a single patient.

The database schema is as follows, where the underlined attribute(s) in each relation collectively form the primary key of that relation:

1. Department (<u>did</u>, deptName, administrator, numberOfBeds)
2. Employee (<u>eid</u>, did, firstName, lastName, jobTitle, startDate, lastDate, gender, dateOfBirth, phone#, email)
3. Patient (<u>medicareNumber</u>, firstName, lastName, gender, dateOfBirth, phone#, address*)
4. Admission (<u>date, MedicareNumber, AssignedDoctor,</u> reasonForAdmission, dateAdmitted, dateDischarged)
5. Visit (<u>time, date, MedicareNumber, DoctorId,</u> diagnosis, medicalReport)

* address consists of civic number, city, postal code, and country.

Doctors and Nurses are special kind of employees for whom we need to record their specialties and departments. Each specialist has a "visit_fee" attribute. Looking at the following queries, you may introduce some minor changes to the design; we might have missed some attributes from some relations.
Use the refinements for the design in your first assignment to be able to answer the following exercises.

Exercise 1: DDL (10 Points)

Provide a set of SQL DDL commands that can be used to create this relational schema. These commands must be runnable in DB2 or PostgreSQL. These commands should define the tables and primary and foreign key constraints that appear in your relational schema. Also, you need to declare the attributes that may and may not be null.

Exercise 2: Populating Data (10 Points)

Provide several INSERT statements with data that will populate the tables, i.e. some Departments (at least 4), some Employees (at least 20), some Patients (at least 20), some Visits (at least 20), and others as needed to be able to get results for the queries in the following exercise.

Exercise 3: Queries (60 Points)

Now, express the following queries in SQL (each query 5 Points):

1. List the information of all doctors who are specialized in heart surgery.
2. List the information of all nurses who are from Laval and started since June 01, 2012 and are still working.
3. Given a patient's medicare number, list the Medical Report of that patient.
4. Given a patient's medicare number, find out how much s/he has paid for each visit since June 2014 in ascending order by date and time.
5. List heart patients who were admitted/visited at least five times.
6. List patient's first name, last name, phone, date admitted, date discharged for all admitted patients with Cancer and HIV.
7. List patient's first name, last name, phone, date admitted, date discharged for all admitted patients with Cancer but do not have HIV.
8. List patient's first name, last name, phone, date admitted, date discharged for all admitted patients who are doctors.
9. List patient's first name, last name, phone, date admitted, date discharged for all admitted patients who visited all doctors in Neurology department.
10. List employee's first name, last name, jobTitle, phone# of employees who are patients and diagnosed with HIV.
11. Give detail of doctors who charge the highest fee for their visit.
12. For each department, provide the department name, the minimum visit fee, the maximum visit fee and the average visit fee charged by doctors in the department where the department have at least two doctors.

Exercise 4: Deleting Data (10 Points)

Provide several DELETE statements that delete all data that you populated the database with in exercise2.

Exercise 5: Deleting tables (10 Points)

Provide several DROP statements that delete all tables that you created in the database in exercise1.