COP 3710 – Intro to Data Engineering

Assignment 1

For Question 1 only, submit a Word or pdf file. For remaining questions, submit properly formatted queries in an SQL file. Name both of your files First and Last name and Assignment 1.

Question 1 (1 point)

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employee (*person name*, *street*, *city*)

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

company (*company name*, *city*)

Employee database.

Consider the employee database above. Give an expression in the relational algebra to express each of the following queries:

a. Find the ID and name of each employee who works for "BigBank".

b. Find the ID, name, and city of residence of each employee who works for "BigBank".

c. Find the ID, name, street address, and city of residence of each employee who works for "BigBank" and earns more than $10000.

d. Find the ID and name of each employee in this database who lives in the same city as the company for which she or he works.

Write SQL queries using the university schema for Questions 2 to 6.

Question 2 (1 point)

a. Find the ID and name of each student who has taken at least one Accounting course; make sure there are no duplicate names in the result.
b. Find the ID and name of each student who has not taken any course offered before 2006.
c. For each department, find the minimum salary of instructors in that department. You may assume that every department has at least one instructor.
d. Find the lowest, across all departments, of the per-department maximum salary computed by the preceding query.

Question 3 (1 point)

a. Create a new course "CS-001", titled "Weekly Seminar", with 1 credits.
b. Create a section of this course in Fall 2009, with sec_id of 1, and with the location of this section not yet specified.
c. Enroll every student in the Comp. Sci. department in the above section.
d. Delete all takes tuples corresponding to any section of any course with the word "advanced" as a part of the title; ignore case when matching the word with the title.

Question 4 (1 point)

Find the names of those departments whose budgets are higher than those of History. List them in alphabetic order.

Question 5 (1 point)

Find the name and ID of those History students advised by an instructor in the Accounting department.

Question 6 (1 point)

Consider the query:

```
WITH dept_total (dept_name, value)
    AS (SELECT dept_name,
            Sum(salary)
       FROM   instructor
       GROUP  BY dept_name),
    dept_total_avg(value)
    AS (SELECT Avg(value)
       FROM   dept_total)
SELECT dept_name
FROM   dept_total,
      dept_total_avg
```

```
WHERE  dept_total.value >= dept_total_avg.value;
```

Rewrite this query without using the with construct.

Question 7 (1 point)

For this question consider the following Library Management System schema:

- member (*member_id*, name, email, phone)
- book (*isbn*, title, author, publication_year)
- loan (*loan_id*, member_id, isbn, loan_date, return_date)

For the above schema, write SQL DDL. Underline indicates primary key or foreign key. Make any reasonable assumptions about data types, and be sure to declare primary and foreign keys.