

Database Systems - CSCI-GA.2433-001 - Fall 2019

Professor: Dennis Shasha

Homework 1 - Due: Monday, September 30, 2019 at 4:30 PM

Each question is worth 10 points. You may work with one partner and sign both of your names to your electronic submission.

You are to create a database containing the following data in MySQL and write queries to answer the questions below. You should hand in one file with your query texts which we will test on different data.

Employee(Name, Salary, Manager, Department)
Smith, 31000, Jones, Switch
Patten, 28000, Warren, Software
Hughes, 33000, Jones, Switch
Jones, 32000, Patten, Switch
Warren, 40000, Patten, Software

Key is Name.

Course(Student, Subj, Prof, Grade)
Smith, Algs, Hackett, 85
Decker, Dbase, Black, 94
Jones, Comp, Roe, 75
Patten, Comp, Roe, 70

Key is Student, Subj.

To get a mysql database going on the NYU servers, please follow the instructions here:
<https://cims.nyu.edu/webapps/content/systems/userservices/databases-selfmanaged>

For me, logging in entails the following line but you will change the user name (following the -u flag) and the database name (following the -p flag):

```
mysql -h warehouse.cims.nyu.edu -u shasha -p shasha_db1
```

```
create table Employee(Name varchar(20), Salary int, Manager varchar(20), Department varchar(20));  
create table Course(Student varchar(20), Subj varchar(20), Prof varchar(20), Grade int);
```

```
insert into Employee (Name, Salary, Manager, Department) values('Smith',31000,'Jones','Switch');  
insert into Employee (Name, Salary, Manager, Department) values('Patten',28000,'Warren','Software');  
insert into Employee (Name, Salary, Manager, Department) values('Hughes',33000,'Jones','Switch');  
insert into Employee (Name, Salary, Manager, Department) values('Jones',32000,'Patten','Switch');  
insert into Employee (Name, Salary, Manager, Department) values('Warren',40000,'Patten','Software');
```

```
insert into Course (Student, Subj, Prof, Grade) values('Smith','Algs','Hackett',85);  
insert into Course (Student, Subj, Prof, Grade) values('Decker','Dbase','Black',94);  
insert into Course (Student, Subj, Prof, Grade) values('Jones','Comp','Roe',75);  
insert into Course (Student, Subj, Prof, Grade) values('Patten','Comp','Roe',70);
```

1. Find all names of employees who work in the software department. On above example data, should be Patten and Warren.
2. Find names of all employees who earn at least 5000 more than their managers. On above example data, should be Warren.

Hint: the following query gives all employees who earn at least 10 more than their managers:

```
select emp1.Name from Employee emp1, Employee emp2
where emp1.Salary >= emp2.Salary + 10 and emp1.Manager = emp2.Name;
```

3. Find all names of employees who received higher grades than their managers in the same course. On above example data, it should be Jones.
4. Find the average salary earned. On example data should be 32,800.
5. Find the average salary earned by people taking Roe's course. On example data should be 30,000
6. For those departments in which more than one employee takes courses, find the average salary by department. Hint: It's fine to use two queries and a CREATE TEMPORARY TABLE command that finds relevant departments first.
7. For the last query "For those departments in which more than one employee takes courses, find the average salary by department" take the data from the query and put it in an output table with schema (columns) department, average salary. Then do a select * from that query.