CSCI 330 Database Systems
Homework 1 (Basic SQL)
Total Points: 20 (5% of course grade)

Goals

The goals of this homework are as follows:

- To become familiar with SQL commands for MySQL in MySQL workbench.
  - To create a database
  - To insert data into tables
  - To write simple SQL queries

The SQL commands from chapter 3 will be sufficient for this homework.

MySQL Server and MySQL workbench are available in every lab machine.

What to do

1. **<u>Create a University Database</u>**
   Create a university database that consists of five tables. Here are the commands from the book to create this database.

```
create table department
    (dept_name      varchar (20),
     building       varchar (15),
     budget         numeric (12,2),
     primary key (dept_name));

create table course
    (course_id      varchar (7),
     title          varchar (50),
     dept_name      varchar (20),
     credits        numeric (2,0),
     primary key (course_id),
     foreign key (dept_name) references department);

create table instructor
    (ID             varchar (5),
     name           varchar (20) not null,
     dept_name      varchar (20),
     salary         numeric (8,2),
     primary key (ID),
     foreign key (dept_name) references department);
```

```
create table section
    (course_id      varchar (8),
     sec_id         varchar (8),
     semester       varchar (6),
     year           numeric (4,0),
     building       varchar (15),
     room_number    varchar (7),
     time_slot_id   varchar (4),
     primary key (course_id, sec_id, semester, year),
     foreign key (course_id) references course);

create table teaches
    (ID             varchar (5),
     course_id      varchar (8),
     sec_id         varchar (8),
     semester       varchar (6),
     year           numeric (4,0),
     primary key (ID, course_id, sec_id, semester, year),
     foreign key (course_id, sec_id, semester, year) references section,
     foreign key (ID) references instructor);
```

You have to write the SQL queries compatible with MySQL to create all these five tables. You may use the SQL script (SampleSQLCommands.txt) which is available on canvas as an initial guideline.

2. Populate Five Tables with Data

ID	*name*	*dept_name*	*salary*
10101	Srinivasan	Comp. Sci.	65000
12121	Wu	Finance	90000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
32343	El Said	History	60000
33456	Gold	Physics	87000
45565	Katz	Comp. Sci.	75000
58583	Califieri	History	62000
76543	Singh	Finance	80000
76766	Crick	Biology	72000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000

instructor relation

dept_name	*building*	*budget*
Biology	Watson	90000
Comp. Sci.	Taylor	100000
Elec. Eng.	Taylor	85000
Finance	Painter	120000
History	Painter	50000
Music	Packard	80000
Physics	Watson	70000

department relation

course_id	sec_id	semester	year	building	room_number	time_slot_id
BIO-101	1	Summer	2009	Painter	514	B
BIO-301	1	Summer	2010	Painter	514	A
CS-101	1	Fall	2009	Packard	101	H
CS-101	1	Spring	2010	Packard	101	F
CS-190	1	Spring	2009	Taylor	3128	E
CS-190	2	Spring	2009	Taylor	3128	A
CS-315	1	Spring	2010	Watson	120	D
CS-319	1	Spring	2010	Watson	100	B
CS-319	2	Spring	2010	Taylor	3128	C
CS-347	1	Fall	2009	Taylor	3128	A
EE-181	1	Spring	2009	Taylor	3128	C
FIN-201	1	Spring	2010	Packard	101	B
HIS-351	1	Spring	2010	Painter	514	C
MU-199	1	Spring	2010	Packard	101	D
PHY-101	1	Fall	2009	Watson	100	A

section relation

ID	course_id	sec_id	semester	year
10101	CS-101	1	Fall	2009
10101	CS-315	1	Spring	2010
10101	CS-347	1	Fall	2009
12121	FIN-201	1	Spring	2010
15151	MU-199	1	Spring	2010
22222	PHY-101	1	Fall	2009
32343	HIS-351	1	Spring	2010
45565	CS-101	1	Spring	2010
45565	CS-319	1	Spring	2010
76766	BIO-101	1	Summer	2009
76766	BIO-301	1	Summer	2010
83821	CS-190	1	Spring	2009
83821	CS-190	2	Spring	2009
83821	CS-319	2	Spring	2010
98345	EE-181	1	Spring	2009

teaches relation

course_id	title	dept_name	credits
BIO-101	Intro. to Biology	Biology	4
BIO-301	Genetics	Biology	4
BIO-399	Computational Biology	Biology	3
CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-190	Game Design	Comp. Sci.	4
CS-315	Robotics	Comp. Sci.	3
CS-319	Image Processing	Comp. Sci.	3
CS-347	Database System Concepts	Comp. Sci.	3
EE-181	Intro. to Digital Systems	Elec. Eng.	3
FIN-201	Investment Banking	Finance	3
HIS-351	World History	History	3
MU-199	Music Video Production	Music	3
PHY-101	Physical Principles	Physics	4

course relation

You have to use the SQL insert commands to populate all these five tables with data (please see above). You may use the SQL script (SQLInsertCommands.txt) which is available on canvas.

3. Write SQL queries for the following (4 * 5 = 20 points)

a. Find courses that taught either in Fall 2009 or in Spring 2010.
b. Find names and average salaries of all departments whose average salary > 42000.
c. Find all instructors earning the highest salary (there may be more than one with the same salary).
d. For each department, find the maximum salary of instructors in that department. You may assume that every department has at least one instructor.
e. Delete all courses that have never been offered (that is, do not occur in the section relation).

What to submit: You have to submit all the SQL queries and their results.

Submission Instructions

- Put all SQL queries and results in one single pdf file. The file name should be **YourLastName-330-HW1.pdf**.
- Upload the pdf file on canvas.

Late Policy:

- No late work will be accepted.