B. Tech 4th Semester

DBMS Lab

Assignment 4

Create tables as shown below:

create table classroom(building varchar(15), room_number varchar(7), capacity numeric(4,0), primary key (building, room_number));

create table department(dept_name varchar(20), building varchar(15), budget numeric(12,2) check (budget > 0), primary key (dept_name));

create table course(course_id varchar(8), title varchar(50), dept_name varchar(20), credits numeric(2,0) check (credits > 0), primary key (course_id), foreign key (dept_name) references department on delete set null);

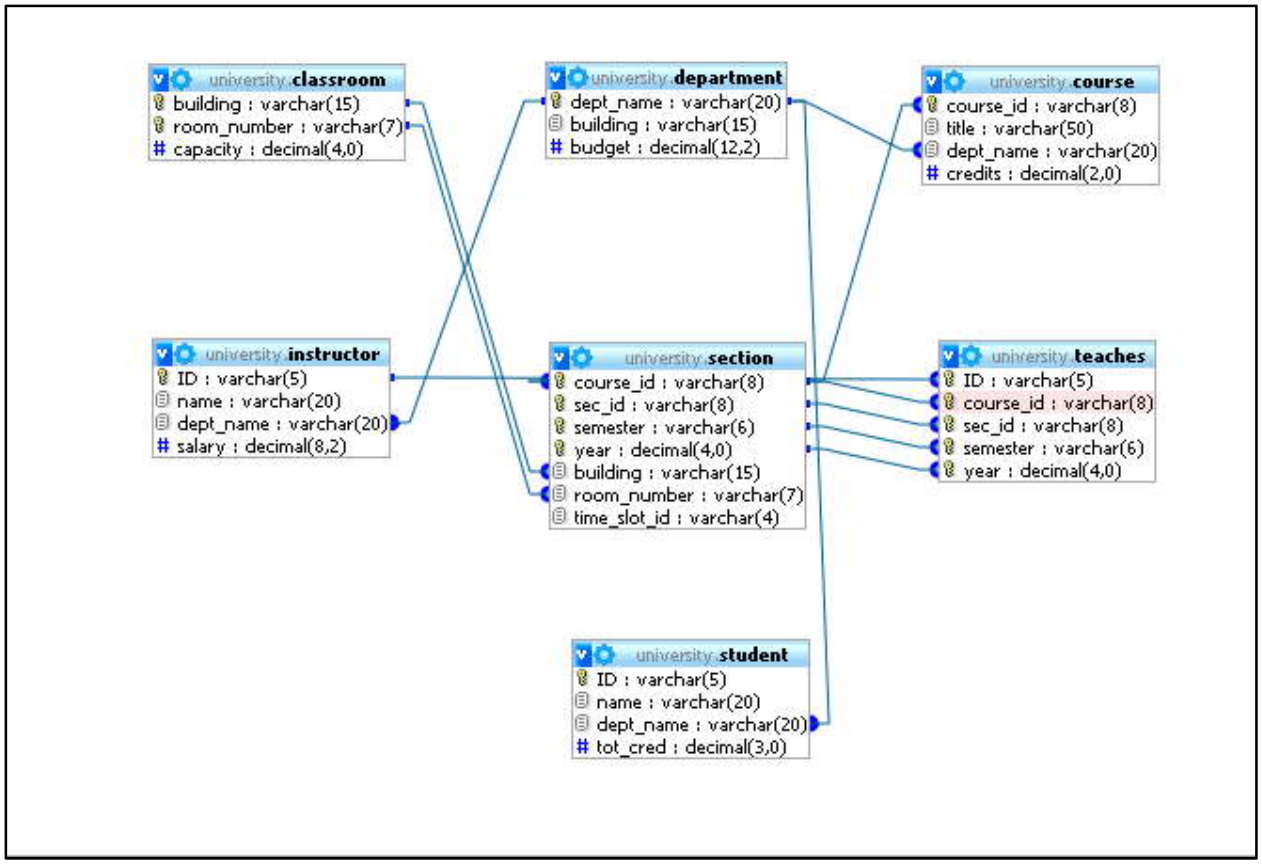
create table instructor(ID varchar(5), name varchar(20) not null, dept_name varchar(20), salary numeric(8,2) check (salary > 29000), primary key (ID), foreign key (dept_name) references department on delete set null);

create table section(course_id varchar(8),sec_id varchar(8), semester varchar(6) check (semester in ('Fall', 'Winter', 'Spring', 'Summer')), year numeric(4,0) check (year > 1701 and year < 2100), 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 on delete cascade, foreign key (building, room_number) references classroom on delete set null);

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 on delete cascade, foreign key (ID) references instructor on delete cascade);

create table student(ID varchar(5), name varchar(20) not null, dept_name varchar(20), tot_cred numeric(3,0) check (tot_cred >= 0), primary key (ID), foreign key (dept_name) references department on delete set null);

Relations between Tables, and Columns



Insert data :

Classroom table

```
insert into classroom values ('Packard', '101', '500');
insert into classroom values ('Painter', '514', '10');
insert into classroom values ('Taylor', '3128', '70');
insert into classroom values ('Watson', '100', '30');
insert into classroom values ('Watson', '120', '50');
```

department table

```
insert into department values ('Biology', 'Watson', '90000');
insert into department values ('Comp. Sci.', 'Taylor', '100000');
insert into department values ('Elec. Eng.', 'Taylor', '85000');
insert into department values ('Finance', 'Painter', '120000');
insert into department values ('History', 'Painter', '50000');
```

```
insert into department values ('Music', 'Packard', '80000');
insert into department values ('Physics', 'Watson', '70000');
```

course table

```
insert into course values ('BIO-101', 'Intro. to Biology', 'Biology', '4');
insert into course values ('BIO-301', 'Genetics', 'Biology', '4');
insert into course values ('BIO-399', 'Computational Biology', 'Biology', '3');
insert into course values ('CS-101', 'Intro. to Computer Science', 'Comp. Sci.', '4');
insert into course values ('CS-190', 'Game Design', 'Comp. Sci.', '4');
insert into course values ('CS-315', 'Robotics', 'Comp. Sci.', '3');
insert into course values ('CS-319', 'Image Processing', 'Comp. Sci.', '3');
insert into course values ('CS-347', 'Database System Concepts', 'Comp. Sci.', '3');
insert into course values ('EE-181', 'Intro. to Digital Systems', 'Elec. Eng.', '3');
insert into course values ('FIN-201', 'Investment Banking', 'Finance', '3');
insert into course values ('HIS-351', 'World History', 'History', '3');
insert into course values ('MU-199', 'Music Video Production', 'Music', '3');
insert into course values ('PHY-101', 'Physical Principles', 'Physics', '4');
```

instructor table

```
insert into instructor values ('10101', 'Srinivasan', 'Comp. Sci.', '65000');
insert into instructor values ('12121', 'Wu', 'Finance', '90000');
insert into instructor values ('15151', 'Mozart', 'Music', '40000');
insert into instructor values ('22222', 'Einstein', 'Physics', '95000');
insert into instructor values ('32343', 'El Said', 'History', '60000');
insert into instructor values ('33456', 'Gold',  'Physics', '87000');
insert into instructor values ('45565', 'Katz', 'Comp. Sci.', '75000');
insert into instructor values ('58583', 'Califieri', 'History', '62000');
insert into instructor values ('76543', 'Singh', 'Finance', '80000');
insert into instructor values ('76766', 'Crick', 'Biology', '72000');
insert into instructor values ('83821', 'Brandt', 'Comp. Sci.', '92000');
insert into instructor values ('98345', 'Kim', 'Elec. Eng.', '80000');
```

section table

```
insert into section values ('BIO-101', '1', 'Summer', '2009', 'Painter', '514', 'B');
insert into section values ('BIO-301', '1', 'Summer', '2010', 'Painter', '514', 'A');
insert into section values ('CS-101', '1', 'Fall', '2009', 'Packard', '101', 'H');
insert into section values ('CS-101', '1', 'Spring', '2010', 'Packard', '101', 'F');
insert into section values ('CS-190', '1', 'Spring', '2009', 'Taylor', '3128', 'E');
insert into section values ('CS-190', '2', 'Spring', '2009', 'Taylor', '3128', 'A');
insert into section values ('CS-315', '1', 'Spring', '2010', 'Watson', '120', 'D');
insert into section values ('CS-319', '1', 'Spring', '2010', 'Watson', '100', 'B');
insert into section values ('CS-319', '2', 'Spring', '2010', 'Taylor', '3128', 'C');
insert into section values ('CS-347', '1', 'Fall', '2009', 'Taylor', '3128', 'A');
insert into section values ('EE-181', '1', 'Spring', '2009', 'Taylor', '3128', 'C');
insert into section values ('FIN-201', '1', 'Spring', '2010', 'Packard', '101', 'B');
insert into section values ('HIS-351', '1', 'Spring', '2010', 'Painter', '514', 'C');
insert into section values ('MU-199', '1', 'Spring', '2010', 'Packard', '101', 'D');
insert into section values ('PHY-101', '1', 'Fall', '2009', 'Watson', '100', 'A');
```

teaches table

```
insert into teaches values ('10101', 'CS-101', '1', 'Fall', '2009');
insert into teaches values ('10101', 'CS-315', '1', 'Spring', '2010');
insert into teaches values ('10101', 'CS-347', '1', 'Fall', '2009');
insert into teaches values ('12121', 'FIN-201', '1', 'Spring', '2010');
insert into teaches values ('15151', 'MU-199', '1', 'Spring', '2010');
insert into teaches values ('22222', 'PHY-101', '1', 'Fall', '2009');
insert into teaches values ('32343', 'HIS-351', '1', 'Spring', '2010');
insert into teaches values ('45565', 'CS-101', '1', 'Spring', '2010');
insert into teaches values ('45565', 'CS-319', '1', 'Spring', '2010');
insert into teaches values ('76766', 'BIO-101', '1', 'Summer', '2009');
insert into teaches values ('76766', 'BIO-301', '1', 'Summer', '2010');
insert into teaches values ('83821', 'CS-190', '1', 'Spring', '2009');
insert into teaches values ('83821', 'CS-190', '2', 'Spring', '2009');
insert into teaches values ('83821', 'CS-319', '2', 'Spring', '2010');
insert into teaches values ('98345', 'EE-181', '1', 'Spring', '2009');
```

student table

```
insert into student values ('00128', 'Zhang', 'Comp. Sci.', '102');
insert into student values ('12345', 'Shankar', 'Comp. Sci.', '32');
insert into student values ('19991', 'Brandt', 'History', '80');
insert into student values ('23121', 'Chavez', 'Finance', '110');
insert into student values ('44553', 'Peltier', 'Physics', '56');
insert into student values ('45678', 'Levy', 'Physics', '46');
insert into student values ('54321', 'Williams', 'Comp. Sci.', '54');
insert into student values ('55739', 'Sanchez', 'Music', '38');
insert into student values ('70557', 'Snow', 'Physics', '0');
insert into student values ('76543', 'Brown', 'Comp. Sci.', '58');
insert into student values ('76653', 'Aoi', 'Elec. Eng.', '60');
insert into student values ('98765', 'Bourikas', 'Elec. Eng.', '98');
insert into student values ('98988', 'Tanaka', 'Biology', '120');
```

Questions

1. Find the names of all the instructors from ‘Comp. Sci.’ department
2. Find the course id and titles of all courses taught by an instructor named 'Srinivasan'
3. Find the ID and name of instructors who have taught a course in the Comp. Sci. department.
4. Find names of instructors who have taught at least one course in Spring 2009

5. Find the capacity of 'Watson' building?
6. Find the names of students taught by the 'Singh'.
7. Find the titles of all courses taught in 'Spring 2010'.
8. Find the ID and name of the instructor whose salary is Maximum.
9. Find out the building name, room number and capacity where 'Robotics' course is taken.
10. Find the ID and name of instructors who have taught 'Database System Concepts'.
11. Find out number of instructor in each department and order the result in descending order.
12. Find the average salary of instructors in each department.
13. Find the names and average salaries of all departments whose average salary is greater than 42000
14. Find courses offered in Fall 2009 and in Spring 2010
15. Find courses offered in Fall 2009 but not in Spring 2010
16. Find the names of all instructors whose salary is greater than the salary of all instructors in the Biology department.
17. Find the average instructors' salaries of those departments where the average salary is greater than 42,000.
18. Increase salaries of instructors whose salary is over 80,000 by 3%, and all others receive a 5% raise