TD 1

Here are the tables we used in class:

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

(a) course

id	name	dept_name	salary
10101	Srinivasan	Comp. Sci.	65000.00
12121	Wu	Finance	90000.00
15151	Mozart	Music	40000.00
22222	Einstein	Physics	95000.00
32343	El Said	History	60000.00
33456	Gold	Physics	87000.00
45565	Katz	Comp. Sci.	75000.00
58583	Califieri	History	62000.00
76543	Singh	Finance	80000.00
76766	Crick	Biology	72000.00
83821	Brandt	Comp. Sci.	92000.00
98345	Kim	Elec. Eng.	80000.00

(b) teacher

id	name	dept_name	tot_cred
00128	Zhang	Comp. Sci.	102
12345	Shankar	Comp. Sci.	32
19991	Brandt	History	80
23121	Chavez	Finance	110
44553	Peltier	Physics	56
45678	Levy	Physics	46
54321	Williams	Comp. Sci.	54
55739	Sanchez	Music	38
70557	Snow	Physics	0
76543	Brown	Comp. Sci.	58
76653	Aoi	Elec. Eng.	60
98765	Bourikas	Elec. Eng.	98
98988	Tanaka	Biology	120

(c) student

course_id	sec_id	semester	year	building	rn	time_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

(d) section

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

(e) teaches

id	course_id	sec_id	semester	year	grade
00128	CS-101	1	Fall	2009	A
00128	CS-347	1	Fall	2009	A-
12345	CS-101	1	Fall	2009	C
12345	CS-190	2	Spring	2009	A
12345	CS-315	1	Spring	2010	A
12345	CS-347	1	Fall	2009	A
19991	HIS-351	1	Spring	2010	B
23121	FIN-201	1	Spring	2010	C+
44553	PHY-101	1	Fall	2009	B-
45678	CS-101	1	Fall	2009	F
45678	CS-101	1	Spring	2010	B+
45678	CS-319	1	Spring	2010	B
54321	CS-101	1	Fall	2009	A-
54321	CS-190	2	Spring	2009	B+
55739	MU-199	1	Spring	2010	A-
76543	CS-101	1	Fall	2009	A
76543	CS-319	2	Spring	2010	A
76653	EE-181	1	Spring	2009	C
98765	CS-101	1	Fall	2009	C-
98765	CS-315	1	Spring	2010	B
98988	BIO-101	1	Summer	2009	A
98988	BIO-301	1	Summer	2010	

(f) takes

dept_name	building	budget
Biology	Watson	90000.00
Comp. Sci.	Taylor	100000.00
Elec. Eng.	Taylor	85000.00
Finance	Painter	120000.00
History	Painter	50000.00
Music	Packard	80000.00
Physics	Watson	70000.00

(g) department

1. Find the titles of courses in Comp. Sci. department that have 3 credits.

```sql
SELECT course.title
FROM course
WHERE credits=3 and dept_name = 'Comp. Sci.';
```

title
Robotics
Image Processing
Database System Concepts

2. Find the names of all instructors, along with their department names and department building name.

```sql
SELECT teacher.name, teacher.dept_name, department.building
FROM teacher, department
WHERE teacher.dept_name = department.dept_name;
```

name	dept_name	building
Srinivasan	Comp. Sci.	Taylor
Wu	Finance	Painter
Mozart	Music	Packard
Einstein	Physics	Watson
El Said	History	Painter
Gold	Physics	Watson
Katz	Comp. Sci.	Taylor
Califieri	History	Painter
Singh	Finance	Painter
Crick	Biology	Watson
Brandt	Comp. Sci.	Taylor
Kim	Elec. Eng.	Taylor

3. Find the names (without duplicates) of all students who have taken at least one Comp. Sci. course.

```sql
SELECT distinct student.name
FROM student, takes, course
WHERE student.id = takes.id and takes.course_id = course.
    course_id and course.dept_name = 'Comp. Sci.';
```

name
Bourikas
Brown
Levy
Shankar
Williams
Zhang

4. Find the names of all students who were taught by an instructor named Einstein; make sure there are no duplicates in the result.

```sql
SELECT distinct student.name
FROM student, teacher, takes, teaches
WHERE student.id = takes.id and takes.course_id = teaches.
    course_id and takes.sec_id = teaches.sec_id and takes.semester
     = teaches.semester and takes.year = teaches.year and teaches.
    id = teacher.id and teacher.name = 'Einstein';
```

Another way to write the same query :

```sql
SELECT distinct student.name
FROM student, teacher, takes, teaches
WHERE student.id = takes.id and (takes.course_id, takes.sec_id,
    takes.semester, takes.year) = (teaches.course_id, teaches.
    sec_id, teaches.semester, teaches.year) and teaches.id =
    teacher.id and teacher.name = 'Einstein';
```

name
Peltier

5. Give the table that lists, for each student, the student name and the `title`, `course id` and `section id` of the courses that the student has taken.

```sql
SELECT student.name, course.title, takes.course_id, takes.sec_id
FROM student, takes, course
WHERE student.id = takes.id and takes.course_id = course.course_id;
```

name	title	course_id	sec_id
Zhang	Intro. to Computer Science	CS-101	1
Zhang	Database System Concepts	CS-347	1
Shankar	Intro. to Computer Science	CS-101	1
Shankar	Game Design	CS-190	2
Shankar	Robotics	CS-315	1
Shankar	Database System Concepts	CS-347	1
Brandt	World History	HIS-351	1
Chavez	Investment Banking	FIN-201	1
Peltier	Physical Principles	PHY-101	1
Levy	Intro. to Computer Science	CS-101	1
Levy	Intro. to Computer Science	CS-101	1
Levy	Image Processing	CS-319	1
Williams	Intro. to Computer Science	CS-101	1
Williams	Game Design	CS-190	2
Sanchez	Music Video Production	MU-199	1
Brown	Intro. to Computer Science	CS-101	1
Brown	Image Processing	CS-319	2
Aoi	Intro. to Digital Systems	EE-181	1
Bourikas	Intro. to Computer Science	CS-101	1
Bourikas	Robotics	CS-315	1
Tanaka	Intro. to Biology	BIO-101	1
Tanaka	Genetics	BIO-301	1