CS313, Assignment - 2

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1 All integrity Constraints

Table	Primary Key	Domain of PK	Foreign key(Referencing table)	Not Null
classroom	building, room_number	varchar	-	-
department	dept_name	varchar	-	-
course	course_id	varchar	foreign key (dept_name) references department	-
instructor	ID	varchar	foreign key (dept_name) references department	name
section	course_id, sec_id, semester, year	varchar varchar varchar numeric	foreign key (course_id) references course, foreign key (building, room_number) references classroom	-
teaches	ID, course_id, sec_id, semester, year	varchar varchar varchar varchar numeric	foreign key (course_id,sec_id, semester, year) references section, foreign key (ID) references instructor	-

Table	Primary Key	Domain of PK	Foreign key(Referencing table)	Not Null
student	ID	varchar	foreign key (dept_name) references department	name
takes	ID, course_id, sec_id, semester, year	varchar varchar varchar varchar numeric	foreign key (course_id,sec_id, semester, year) references section, foreign key (ID) references student	-
advisor	s_ID	varchar	foreign key (i_ID) references instructor (ID), foreign key (s_ID) references student (ID)	-
time_slot	time_slot_id, day, start_hr, start_min	varchar varchar numeric numeric	-	-
prereq	course_id, prereq_id	varchar varchar	foreign key (course_id) references course, foreign key (prereq_id) references course	-

Table 1: Integrity Constraints of all tables

2 One student's complete profile

```
1   select * from student, department, takes, advisor, instructor
2   where student.name='Shankar'
3     and student.dept_name=department.dept_name
4     and student.ID=takes.ID
5     and (student.ID=advisor.s_ID and instructor.ID=advisor.i_ID)
6     and department.dept_name=instructor.dept_name;
```

ID	name	dept_name	tot_cred	dept_name	building	budget	ID	course_id	sec_id	semester	year	grade	s_ID	i_ID	ID	name	dept_name	salary
12345	Shankar	Comp. Sci.	32	Comp. Sci.	Taylor	100000	12345	CS-101	1	Fall	2017	C	12345	10101	10101	Srinivasan	Comp. Sci.	65000
12345	Shankar	Comp. Sci.	32	Comp. Sci.	Taylor	100000	12345	CS-190	2	Spring	2017	A	12345	10101	10101	Srinivasan	Comp. Sci.	65000
12345	Shankar	Comp. Sci.	32	Comp. Sci.	Taylor	100000	12345	CS-315	1	Spring	2018	A	12345	10101	10101	Srinivasan	Comp. Sci.	65000
12345	Shankar	Comp. Sci.	32	Comp. Sci.	Taylor	100000	12345	CS-347	1	Fall	2017	A	12345	10101	10101	Srinivasan	Comp. Sci.	65000

Figure 1: Query output

3 Trying out various queries

a Table: classroom

```
1   insert into classroom values('My Building', 1234, 1000);
2   select building, room_number from classroom where capacity >=50;
```

building	room_number
Packard	101
Taylor	3128
Watson	120
My Building	1234

Figure 2: Query output

b Table: department

```
1   insert into department values('My New Department', 'Watson',
      200000);
2   select * from department where budget >50000;
```

dept_name	building	budget
Biology	Watson	90000
Comp. Sci.	Taylor	100000
Elec. Eng.	Taylor	85000
Finance	Painter	120000
Music	Packard	80000
Physics	Watson	70000
My New Department	Watson	200000

Figure 3: Query output

c Table: course

```
1   insert into course values('NN−101', 'A New Course', 'History', 5)
      ;
2   select * from course where credits >4;
```

course_id	title	dept_name	credits
NN-101	A New Course	History	5

Figure 4: Query output

d Table: instructor

```
1   insert into instructor values('12345', 'A New Instructor', 'Comp.
      Sci.', 50000);
2   select ID, name from instructor where dept_name='Comp. Sci.';
```

ID	name
10101	Srinivasan
45565	Katz
83821	Brandt
12345	A New Instructor

Figure 5: Query output

e   Table: section

```
1    insert into section values ('CS−319', '3', 'Summer', 2019, 'Watson
       ', '514', 'A');
2    select * from section where course_id='CS−319';
```

course_id	sec_id	semester	year	building	room_number	time_slot_id
CS-319	1	Spring	2018	Watson	100	B
CS-319	2	Spring	2018	Taylor	3128	C
CS-319	3	Summer	2019	Watson	514	A

Figure 6: Query output

f   Table: teaches

```
1    insert into teaches values ('45565', 'CS−101', '1', 'Fall', 2017);
2    select * from teaches where ID='45565';
```

ID	course_id	sec_id	semester	year
45565	CS-101	1	Fall	2017
45565	CS-101	1	Spring	2018
45565	CS-319	1	Spring	2018

Figure 7: Query output

g   Table: student

```
1    insert into student values ('99999', 'New Name', 'Comp. Sci.', 35)
       ;
2    select name from student where tot_cred <=40;
```

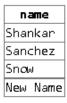| name |
|------|
| Shankar |
| Sanchez |
| Snow |
| New Name |

Figure 8: Query output

h Table: takes

```
1    insert into takes values('44553', 'CS-347', '1', 'Fall', 2017, 'A
         -');
2    select * from takes where ID='44553';
```

ID	course_id	sec_id	semester	year	grade
44553	CS-347	1	Fall	2017	A-
44553	PHY-101	1	Fall	2017	B-

Figure 9: Query output

i Table: advisor

```
1    insert into advisor values('19991', '22222');
2    select * from advisor where i_ID='22222';
```

s_ID	i_ID
44553	22222
45678	22222
19991	22222

Figure 10: Query output

j   Table: time_slot

```
1    insert into time_slot values('NEW', 'R', 13, 31, 14, 45);
2    select * from time_slot where day='R';
```

time_slot_id	day	start_hr	start_min	end_hr	end_min
E	R	10	30	11	45
F	R	14	30	15	45
NEW	R	13	31	14	45

Figure 11: Query output

k   Table: prereq

```
1    insert into prereq values('PHY−101', 'BIO−101');
2    select * from prereq where prereq_id='BIO−101';
```

course_id	prereq_id
BIO-301	BIO-101
BIO-399	BIO-101
PHY-101	BIO-101

Figure 12: Query output

4   Additional Queries

a

```
1    select student.ID, student.name from student, takes, section
2    where student.dept_name='Comp. Sci.'
3      and student.ID=takes.ID
4      and takes.course_id=section.course_id
5      and section.building='Watson'
```

ID	name
12345	Shankar
76543	Brown

Figure 13: Query output

b

```
1   select ID, name
2   from student natural join takes
3   where takes.grade='A'
4
5   intersect
6
7   select ID, name
8   from student natural join takes
9   where takes.grade='C'
```

ID	name
12345	Shankar

Figure 14: Query output

c

```
1   select distinct building, room_number
2   from section natural join time_slot
3   where time_slot.day='W'
```

building	room_number
Painter	514
Packard	101
Taylor	3128
Watson	120
Watson	100

Figure 15: Query output