

PROGRAM 4: STUDENT_FACULTY DATABASE

Consider the following database for student enrolment for course:

STUDENT (snum: integer, sname: string, major: string, level: string, age: integer)

CLASS (name: string, meets at: time, room: string, fid: integer)

ENROLLED (snum: integer, cname: string)

FACULTY (fid: integer, fname: string, deptid: integer)

The meaning of these relations is straightforward; for example, Enrolled has one record per student-class such that the student is enrolled in the class.

Level is a two character code with 4 different values (example: Junior: JR etc)

Write the following queries in SQL. No duplicates should be printed in any of the answers.

- i. Find the names of all Juniors (level = JR) who are enrolled in a class taught by
- ii. Find the names of all classes that either meet in room R128 or have five or more Students enrolled.
- iii. Find the names of all students who are enrolled in two classes that meet at the same time.
- iv. Find the names of faculty members who teach in every room in which some class is taught.
- v. Find the names of faculty members for whom the combined enrolment of the courses that they teach is less than five.
- vi. Find the names of students who are not enrolled in any class.
- vii. For each age value that appears in Students, find the level value that appears most often. For example, if there are more FR level students aged 18 than SR, JR, or SO students aged 18, you should print the pair (18, FR)

```
create database student_faculty;
```

```
use student_faculty;
```

```
create table student(
```

```
snum int primary key,
```

```
sname varchar(30),
```

```
major varchar(30),  
lvl varchar(30),  
age int  
);
```

```
create table faculty(  
fid int primary key,  
fname varchar(30),  
dept_id int  
);
```

```
create table class(  
cname varchar(30) primary key,  
meets_at varchar(30),  
room varchar(30),  
fid int,  
constraint fk_1  
foreign key(fid) references faculty(fid)  
);
```

```
create table enrolled(  
snum int ,  
cname varchar(30),  
constraint fk_2  
foreign key(snum) references student(snum),  
constraint fk_3  
foreign key(cname) references class(cname)  
);
```

insert into student values

(1,'Jhon','CS','SR',19),(2,'Smith','CS','JR',17),(3,'Jacob','CV','FR',20),(4,'Tom','CS','FR',25),(5,'Rahul','CS','JR',20),(6,'RANA','CS','FR',21);

		snum	sname	major	lvl	age
<input type="checkbox"/>	Edit Copy Delete	1	Jhon	CS	SR	19
<input type="checkbox"/>	Edit Copy Delete	2	Smith	CS	JR	17
<input type="checkbox"/>	Edit Copy Delete	3	Jacob	CV	FR	20
<input type="checkbox"/>	Edit Copy Delete	4	Tom	CS	FR	25
<input type="checkbox"/>	Edit Copy Delete	5	Rahul	CS	JR	20
<input type="checkbox"/>	Edit Copy Delete	6	Rana	CS	FR	21

insert into faculty values

(11,'Harish',1000),(12,'MV',1000),(13,'Mira',1001),(14,'Shiva',1002),(15,'Nupur',1000);

		fid	fname	dept_id
<input type="checkbox"/>	Edit Copy Delete	11	Harish	1000
<input type="checkbox"/>	Edit Copy Delete	12	MV	1000
<input type="checkbox"/>	Edit Copy Delete	13	Mira	1001
<input type="checkbox"/>	Edit Copy Delete	14	Shiva	1002
<input type="checkbox"/>	Edit Copy Delete	15	Nupur	1000

insert into class values ('class1','12/11/15 10:15:16','R1',14),('class10','12/11/15 10:15:16','R128',14),('class2','12/11/15 10:15:20','R2',12),('class3','12/11/15 10:15:25','R3',11),('class4','12/11/15 20:15:20','R4',14),('class5','12/11/15 20:15:20','R3',15),('class6','12/11/15 13:20:20','R128',14),('class7','12/11/15 10:10:10','R3',14);

		cname	meets_at	room	fid
<input type="checkbox"/>	Edit Copy Delete	class1	12/11/15 10:15:16	R1	14
<input type="checkbox"/>	Edit Copy Delete	class10	12/11/15 10:15:16	R128	14
<input type="checkbox"/>	Edit Copy Delete	class2	12/11/15 10:15:20	R2	12
<input type="checkbox"/>	Edit Copy Delete	class3	12/11/15 10:15:25	R3	11
<input type="checkbox"/>	Edit Copy Delete	class4	12/11/15 20:15:20	R4	14
<input type="checkbox"/>	Edit Copy Delete	class5	12/11/15 20:15:20	R3	15
<input type="checkbox"/>	Edit Copy Delete	class6	12/11/15 13:20:20	R128	14
<input type="checkbox"/>	Edit Copy Delete	class7	12/11/15 10:10:10	R3	14

insert into enrolled values

(1,'class1'),(2,'class1'),(3,'class3'),(4,'class3'),(5,'class4'),(1,'class5'),(2,'class5'),(3,'class5'),(4,'class5'),(5,'class5');

snum	cname
1	class1
2	class1
3	class3
4	class3
5	class4
1	class5
2	class5
3	class5
4	class5
5	class5

```
select student.sname from student where student.snum in (select enrolled.snum from
enrolled where enrolled.cname in (select class.cname from class where class.fid in (select
f.fid from faculty f where f.fname='Harish')))) and student.lvl='Jr'; #1
```

```
Showing rows 0 - 0 (1 total, Query took 0.0098 seconds.)

select student.sname from student where student.snum in (select enrolled.snum from enrolled where enrolled.cname in (select class.cname from class
where class.fid in (select f.fid from faculty f where f.fname='Harish')) and student.lvl='Jr')

[ ] Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

[ ] Show all | Number of rows: 25 Filter rows: Search this table

+ Options
← T → sname
[ ] Edit Copy Delete Tom
```

```
select class.cname from class where class.cname in (select enrolled.cname from enrolled
group by enrolled.cname having count(*)>=5) or class.room='R128'; #2
```

Showing rows 0 - 2 (3 total, Query took 0.0513 seconds.)

```
select class.cname from class where class.cname in (select enrolled.cname from enrolled group by enrolled.cname having count(*)>=5) or class.room='R128'
```

☐ Profiling [\[Edit inline\]](#) [\[Edit\]](#) [\[Explain SQL\]](#) [\[Create PHP code\]](#) [\[Refresh\]](#)

☐ Show all | Number of rows: Filter rows: Sort by key:

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	cname
<input type="checkbox"/> Edit Copy Delete	class10
<input type="checkbox"/> Edit Copy Delete	class5
<input type="checkbox"/> Edit Copy Delete	class6

```
create table ref as(
```

```
select ou.cname,ou.meets_at from class ou where exists (select inn.cname from class inn
where inn.meets_at=ou.meets_at having count(*)>1)
```

); #3

create table ref1 as(

select enrolled.snum,enrolled.cname,ref.meets_at from enrolled inner join ref on
enrolled.cname=ref.cname

); #3

select student.sname from student where student.snum in (select ou.snum from ref1 ou,
ref1 inn where ou.snum=inn.snum AND ou.cname!=inn.cname and
ou.meets_at=inn.meets_at group by ou.snum); #3

Showing rows 0 - 0 (1 total, Query took 0.0103 seconds.)

```
#3 select student.sname from student where student.snum in (select ou.snum from ref1 ou, ref1 inn where ou.snum=inn.snum AND ou.cname!=inn.cname and ou.meets_at=inn.meets_at group by ou.snum)
```

[Edit inline] [Edit] [Create PHP code]

☐ Show all | Number of rows: 25 | Filter rows: Search this table

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← T → sname

☐ Edit Copy Delete Rahul

create table ref1 as(

select count(distinct(class.room))as c from class where class.cname in (select
distinct(enrolled.cname) from enrolled)

); #4

select faculty.fname from faculty where faculty.fid in (select (class.fid) from class where
class.room in(select distinct(class.room) from class where class.cname in (select
distinct(enrolled.cname) from enrolled)) group by class.fid having count(*)=(select ref1.c
from ref1)); #4

select distinct f.fname from faculty f where not exists ((select c.room from class c) MINUS
(select c1.room from class c1 where c1.fid=f.fid));

Showing rows 0 - 0 (1 total, Query took 0.0129 seconds.)

```
select faculty.fname from faculty where faculty.fid in (select (class.fid) from class where class.room in( select distinct(class.room) from class where class.cname in (select distinct(enrolled.cname) from enrolled)) group by class.fid having count(*)=(select refer.c from refer))
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 | Filter rows: Search this table

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← T → fname

☐ Edit Copy Delete Shiva

select faculty.fname from faculty where faculty.fid in (select class.fid from class where class.cname not in (select enrolled.cname from enrolled group by enrolled.cname having count(*)>=5)); #5

Showing rows 0 - 2 (3 total, Query took 0.0066 seconds.)

```
select faculty.fname from faculty where faculty.fid in (select class.fid from class where class.cname not in (select enrolled.cname from enrolled group by enrolled.cname having count(*)>=5))
```

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☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

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	fname
<input type="checkbox"/> Edit Copy Delete	Harish
<input type="checkbox"/> Edit Copy Delete	MV
<input type="checkbox"/> Edit Copy Delete	Shiva

select student.sname from student where student.snum not in (select distinct(enrolled.snum) from enrolled); #6

Showing rows 0 - 0 (1 total, Query took 0.0352 seconds.)

```
select student.sname from student where student.snum not in (select distinct(enrolled.snum) from enrolled)
```

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☐ Show all | Number of rows: 25 | Filter rows: Search this table

+ Options

	sname
<input type="checkbox"/> Edit Copy Delete	Rana

SELECT s.age, s.lvl FROM student s GROUP BY s.age, s.lvl HAVING s.lvl IN (SELECT s1.lvl FROM student

s1 WHERE s1.age=s.age GROUP BY s1.age, s1.lvl HAVING COUNT(*) >= ALL (SELECT COUNT(*) FROM

student s2 WHERE s1.age=s2.age GROUP BY s2.lvl, s2.age)) ORDER BY s.age; #7

Showing rows 0 - 4 (5 total, Query took 0.0148 seconds.) [age: 17... - 25...]

```
SELECT s.age, s.lvl FROM student s GROUP BY s.age, s.lvl HAVING s.lvl IN (SELECT s1.lvl FROM student s1 WHERE s1.age=s.age GROUP BY s1.age, s1.lvl HAVING COUNT(*) >= ALL (SELECT COUNT(*) FROM student s2 WHERE s1.age=s2.age GROUP BY s2.lvl, s2.age)) ORDER BY s.age
```

☐ Profiling [\[Edit inline\]](#) [\[Edit\]](#) [\[Explain SQL\]](#) [\[Create PHP code\]](#) [\[Refresh\]](#)

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	age	lvl
<input type="checkbox"/> Edit Copy Delete	17	JR
<input type="checkbox"/> Edit Copy Delete	19	SR
<input type="checkbox"/> Edit Copy Delete	20	JR
<input type="checkbox"/> Edit Copy Delete	21	FR
<input type="checkbox"/> Edit Copy Delete	25	FR