PROGRAM 4: STUDENT FACULTY DATABASE

Consider the following database for student enrollment for course :

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

CLASS(cname: string, meetsat: time, room: string, fid: integer)

ENROLLED(snum: integer, cname:string)

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

create database Lab4;

use Lab4;

create table student(snum int, sname varchar(10), major varchar(2), lvl varchar(2), age int,primary key (snum));

desc student;

	Field	Type	Null	Key	Default	Extra
▶	snum	int	NO	PRI	NULL	
	sname	varchar(10)	YES		NULL	
	major	varchar(2)	YES		NULL	
	lvl	varchar(2)	YES		NULL	
	age	int	YES		NULL	

create table faculty(fid int, fname varchar(20), deptid int,primary key(fid));

desc faculty;

	Field	Type	Null	Key	Default	Extra
▶	fid	int	NO	PRI	NULL	
	fname	varchar(20)	YES		NULL	
	deptid	int	YES		NULL	

create table class(cname varchar(20), meetsat timestamp, room varchar(10), fid int,primary key (cname),foreign key(fid) references faculty(fid));

desc class;

	Field	Type	Null	Key	Default	Extra
▶	cname	varchar(20)	NO	PRI	NULL	
	meetsat	timestamp	YES		NULL	
	room	varchar(10)	YES		NULL	
	fid	int	YES	MUL	NULL	

create table enrolled(snum int, cname varchar(20),primary key(snum,cname),

foreign key(snum) references student(snum),

foreign key(cname) references class(cname));

desc enrolled;

	Field	Type	Null	Key	Default	Extra
▶	snum	int	NO	PRI	NULL	
	cname	varchar(20)	NO	PRI	NULL	

insert into student values(1, 'jhon', 'CS', 'Sr', 19);

insert into student values(2, 'Smith', 'CS', 'Jr', 20);

insert into student values(3 , 'Jacob', 'CV', 'Sr', 20);

insert into student values(4, 'Tom ', 'CS', 'Jr', 20);

insert into student values(5, 'Rahul', 'CS', 'Jr', 20);

insert into student values(6, 'Rita', 'CS', 'Sr', 21);

select * from student;

snum	sname	major	lvl	age
1	jhon	CS	Sr	19
2	Smith	CS	Jr	20
3	Jacob	CV	Sr	20
4	Tom	CS	Jr	20
5	Rahul	CS	Jr	20
6	Rita	CS	Sr	21
NULL	NULL	NULL	NULL	NULL

insert into faculty values(11, 'Harish', 1000);

insert into faculty values(12, 'MV', 1000);

insert into faculty values(13 , 'Mira', 1001);

insert into faculty values(14, 'Shiva', 1002);

insert into faculty values(15, 'Nupur', 1000);

select * from faculty;

fid	fname	deptid
11	Harish	1000
12	MV	1000
13	Mira	1001
14	Shiva	1002
15	Nupur	1000
NULL	NULL	NULL

insert into class values('class1', '12/11/15 10:15:16', 'R1', 14);

insert into class values('class10', '12/11/15 10:15:16', 'R128', 14);

insert into class values('class2', '12/11/15 10:15:20', 'R2', 12);

insert into class values('class3', '12/11/15 10:15:25', 'R3', 12);

insert into class values('class4', '12/11/15 20:15:20', 'R4', 14);

insert into class values('class5', '12/11/15 20:15:20', 'R3', 15);

```
insert into class values('class6', '12/11/15 13:20:20', 'R2', 14);
insert into class values('class7', '12/11/15 10:10:10', 'R3', 14);
select * from class;
```

cname	meetsat	room	fid
class1	2012-11-15 10:15:16	R1	14
class10	2012-11-15 10:15:16	R128	14
class2	2012-11-15 10:15:20	R2	12
class3	2012-11-15 10:15:25	R3	11
class4	2012-11-15 20:15:20	R4	14
class5	2012-11-15 20:15:20	R3	15
class6	2012-11-15 13:20:20	R2	14
class7	2012-11-15 10:10:10	R3	14
NULL	NULL	NULL	NULL

```
insert into enrolled values(1, 'class1');
insert into enrolled values(2, 'class1');
insert into enrolled values(3, 'class3');
insert into enrolled values(4, 'class3');
insert into enrolled values(5, 'class4');
insert into enrolled values(1, 'class5');
insert into enrolled values(2, 'class5');
insert into enrolled values(3, 'class5');
insert into enrolled values(4, 'class5');
insert into enrolled values(5, 'class5');
select * from enrolled;
```

	snum	cname
▶	1	class1
	2	class1
	3	class3
	4	class3
	5	class4
	1	class5
	2	class5
	3	class5
	4	class5
	5	class5
*	NULL	NULL

i. Find the names of all Juniors (level = JR) who are enrolled in a class taught by Harish

```
SELECT DISTINCT S.sname
FROM student S, class C, enrolled E, faculty F
WHERE S.snum = E.snum AND E.cname = C.cname AND C.fid = F.fid AND
F.fname = 'Harish' AND S.lvl = 'Jr';
```

	sname
▶	Tom

ii.Find the names of all classes that either meet in room R128 or have five or more Students enrolled.

```
SELECT C.cname
FROM class C WHERE C.room = 'R128'
OR C.cname IN (SELECT E.cname FROM enrolled E
GROUP BY E.cname HAVING COUNT(*) >= 5);
```

	cname
▶	class10
	class5
*	NULL

iii. Find the names of all students who are enrolled in two classes that meet at the same time.

```
SELECT DISTINCT S.sname

FROM student S

WHERE S.snum IN (SELECT E1.snum

FROM enrolled E1, enrolled E2, class C1, class C2

WHERE E1.snum = E2.snum AND E1.cname <> E2.cname

AND E1.cname = C1.cname

AND E2.cname = C2.cname AND C1.meetsat = C2.meetsat);
```

	sname
▶	Rahul

iv.Find the names of faculty members who teach in every room in which some class is taught.

```
SELECT f.fname,f.fid

FROM faculty f

WHERE f.fid in ( SELECT fid FROM class

GROUP BY fid HAVING COUNT(*)=(SELECT COUNT(DISTINCT room) FROM class) );
```

	fname	fid
▶	Shiva	14
*	NULL	NULL

v.Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than five.

```
SELECT DISTINCT F.fname

FROM faculty F

WHERE 5 > (SELECT COUNT(E.snum)

FROM class C, enrolled E
```

```
WHERE C.cname = E.cname

AND C.fid = F.fid);
```

	fname
▶	Harish
	MV
	Mira
	Shiva

vi. Find the names of students who are not enrolled in any class.

```
SELECT DISTINCT S.sname

FROM student S

WHERE S.snum NOT IN (SELECT E.snum

FROM enrolled E );
```

	sname
▶	Rita

vii.For each age value that appears in Students, find the level value that appears most often.

```
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.lvl, S1.age

HAVING COUNT(*) >= ALL (SELECT COUNT(*)

FROM Student S2

WHERE s1.age = S2.age

GROUP BY S2.lvl, S2.age));
```

	age	lvl
▶	19	Sr
	20	Jr
	21	Sr