

Mithibai College
Department of Computer Science

Msc(Data Sci and AI)

Practical-2: Subquery-join operations on Relational Schema

Name : Nakshtra Chavan

Roll no : L011

1. Design ERD for the following schema and execute the following Queries on it:

Consider the schema for Movie Database:

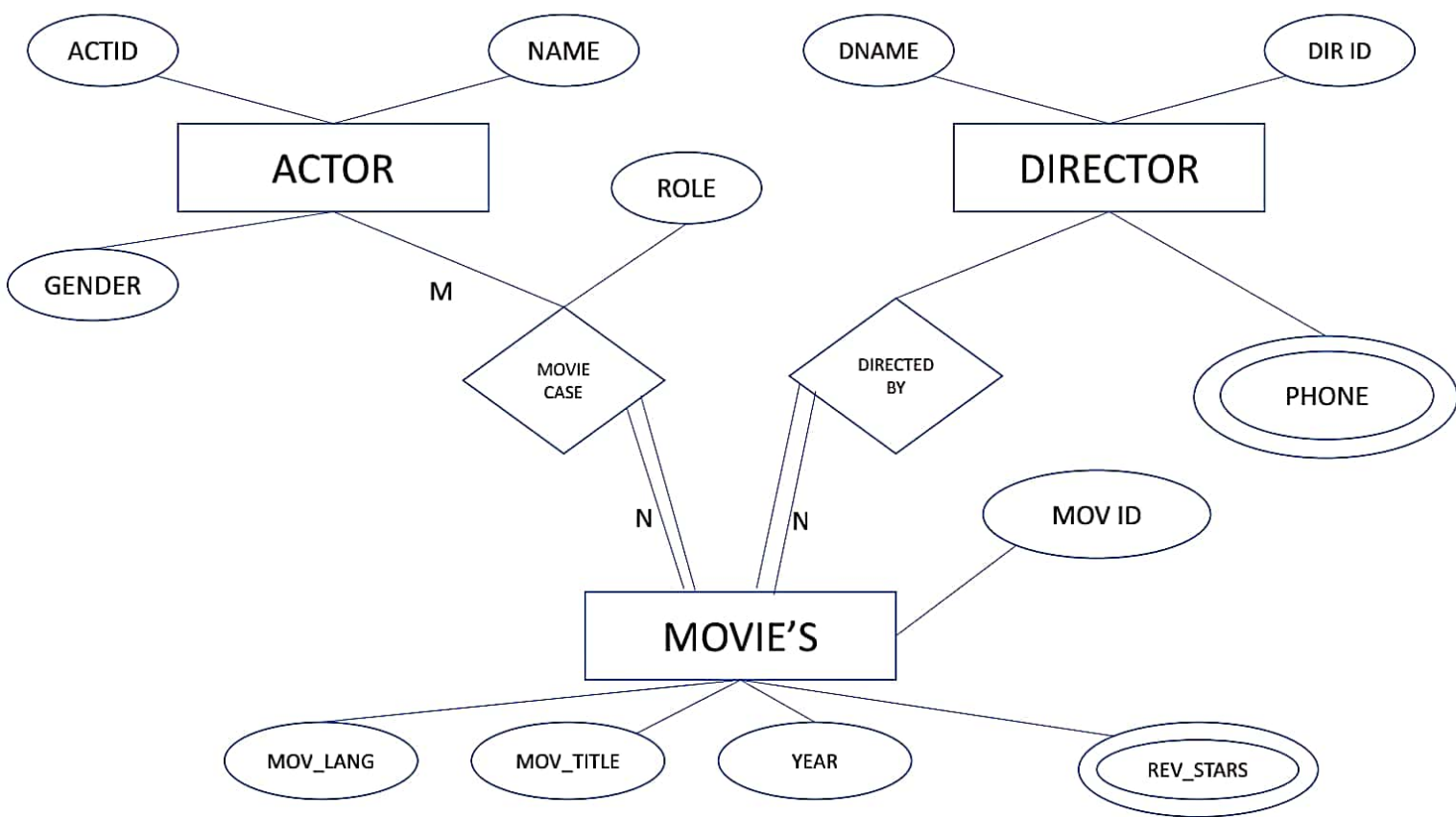
ACTOR (Act_id, Act_Name, Act_Gender)

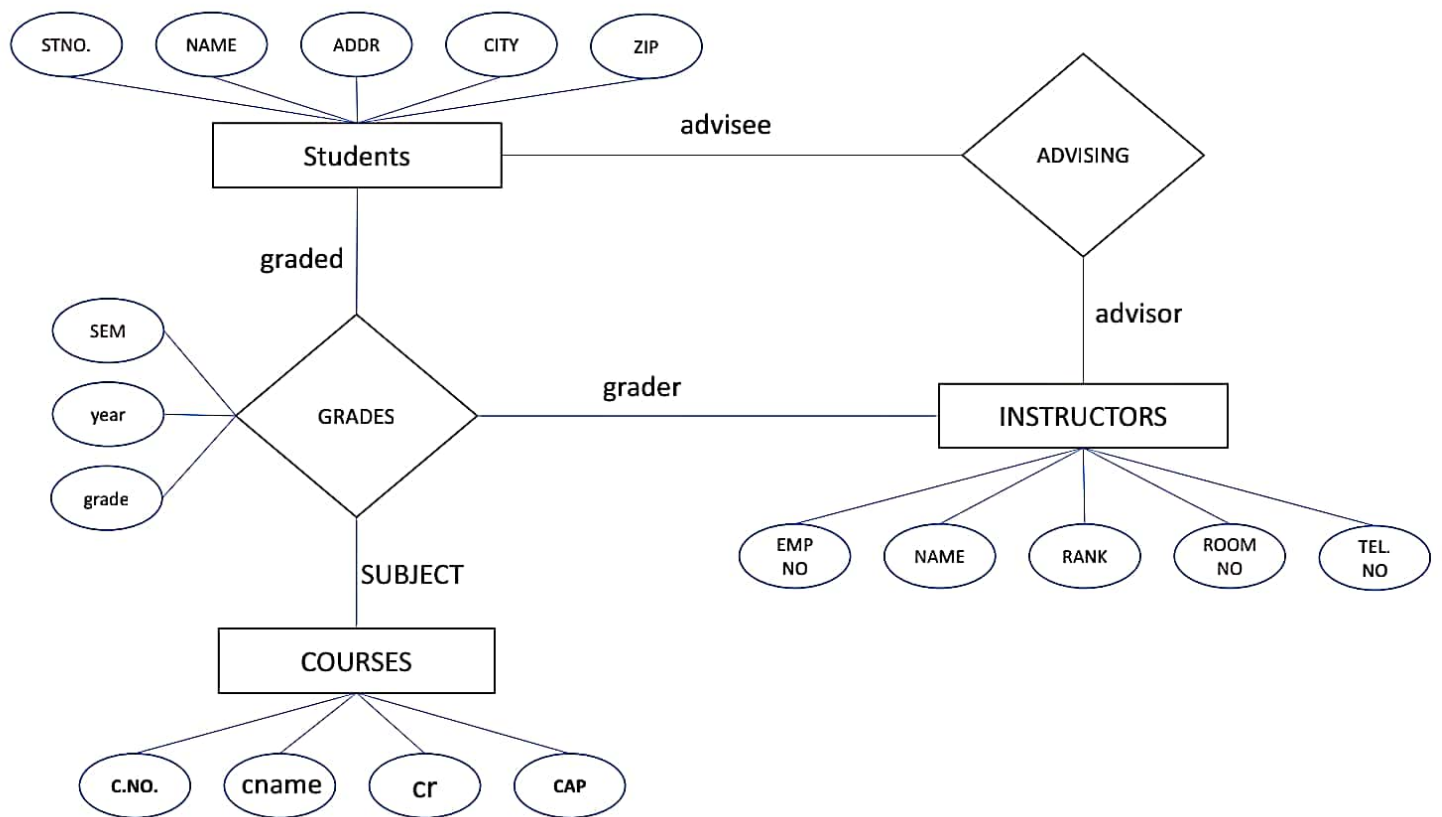
DIRECTOR (Dir_id, Dir_Name, Dir_Phone)

MOVIES (Mov_id, Mov_Title, Mov_Year, Mov_Lang, Dir_id)

MOVIE_CAST (Act_id, Mov_id, Role)

RATING (Mov_id, Rev_Stars)





Mithibai College
Department of Computer Science
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Name:-Arpit Chauhan

Roll No:-40

Practical-2 : Subquery-join operations on Relational Schema

#1. USING (practical 1)

1. Count the customers with grades above NewYork average

```
mysql> SELECT grade, COUNT(*) FROM customer GROUP BY grade HAVING grade > (SELECT  
AVG(grade) FROM customer WHERE city = 'New York');
```

grade	COUNT(*)
200	3
300	2

2 rows in set (0.02 sec)

2.Find the name and numbers of all salesmen who had more than one customer

```
mysql> select salesman_id,name from salesman a where 1<(select count(*) from  
customer where salesman_id=a.salesman_id);
```

salesman_id	name
5001	James Hoog
5002	Nail Knite

2 rows in set (0.01 sec)

3)Demonstrate the DELETE operation by removing salesman with id 1000. All his orders must also be deleted

```
mysql> delete from salesman where salesman_id=1000;
```

Query OK, 0 rows affected (0.00 sec)

Q2. Design ERD for the following schema and execute the following Queries on it:

Consider the schema for Movie Database:

ACTOR (Act_id, Act_Name, Act_Gender)

DIRECTOR (Dir_id, Dir_Name, Dir_Phone)

MOVIES (Mov_id, Mov_Title, Mov_Year, Mov_Lang, Dir_id)

MOVIE_CAST (Act_id, Mov_id, Role)

RATING (Mov_id, Rev_Stars)

```

mysql> create table Actor(act_id integer primary key,act_name
varchar(100),act_gender varchar(10));
Query OK, 0 rows affected (0.01 sec)

mysql> create table Director(dir_id integer primary key,dir_name
varchar(200),dir_phone varchar(100));
Query OK, 0 rows affected (0.01 sec)

mysql> create table Movies(mov_id integer primary key,mov_title
varchar(255),mov_year year,mov_lang varchar(100),dir_id int, foreign key (dir_id)
references Director(dir_id));
Query OK, 0 rows affected (0.02 sec)

mysql> create table Movie_cast (act_id int,foreign key (act_id) references
Actor(act_id), mov_id int, foreign key(mov_id) references Movies(mov_id),role
varchar(100), primary key(act_id,mov_id) );
Query OK, 0 rows affected (0.02 sec)

mysql> create table Rating(mov_id integer primary key , foreign key(mov_id)
references Movies(mov_id),rev_stars integer);
Query OK, 0 rows affected (0.01 sec)

mysql> insert into Actor values(301, 'anuska','f'),
-> (302,'PRABHAS','M'),
-> (303,'PUNITH','M'),
-> (304,'jermy','M');
Query OK, 4 rows affected (0.03 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql> insert into director values(60, 'rajamouli',8751611001),
-> (61,'HITCHCOCK', 7766138911),
-> (62,'FARAN', 9986776531),
-> (63,'STEVEN SPIELBERG', 8989776530);
Query OK, 4 rows affected (0.00 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql> insert into movies values(1001,'BAHUBALI-2', 2017, 'TELAGU', 60),
-> (1002,'BAHUBALI-2', 2015, 'TELAGU', 60),
-> (1003,'AKASH', 2008, 'KANNADA', 61),
-> (1004,'WAR HORSE', 2011, 'ENGLISH', 63);
Query OK, 4 rows affected (0.00 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql> INSERT INTO MOVIE_CAST VALUES (301, 1002, 'HEROINE'),
-> (301, 1001, 'HEROINE'),
-> (303, 1003, 'HERO'),
-> (303, 1002, 'guest'),

```

```

-> (304, 1004, 'hero');
Query OK, 5 rows affected (0.00 sec)
Records: 5 Duplicates: 0 Warnings: 0

```

```

mysql> INSERT INTO RATING VALUES (1001, 4),
-> (1002, 2),
-> (1003, 5),
-> (1004, 4);
Query OK, 4 rows affected (0.00 sec)
Records: 4 Duplicates: 0 Warnings: 0

```

#Write SQL queries to

1. List the titles of all movies directed by 'Hitchcock'

```

mysql> select mov_title from movies where dir_id in(select dir_id from director
where dir_name='hitchcock');
+-----+
| mov_title |
+-----+
| AKASH     |
+-----+
1 row in set (0.00 sec)

```

2. Find the movie names where one or more actors acted in two or more movies.

```

mysql> select mov_title from movies m, movie_cast mv where m.mov_id=mv.mov_id and
act_id in(select act_id from movie_cast group by act_id having count(act_id)>1)
group by mov_title having count(*)>1;
+-----+
| mov_title |
+-----+
| BAHUBALI-2 |
+-----+
1 row in set (0.00 sec)

```

3. List all actors who acted in a movie before 2000 and also in a movie after 2015 (use JOIN operation).

```

mysql> select a.act_name, c.mov_title, c.mov_year from actor a, movie_cast b, movies c
where a.act_id=b.act_id and b.mov_id=c.mov_id and c.mov_year not between 2000 and
2015;
+-----+-----+-----+
| act_name | mov_title | mov_year |
+-----+-----+-----+
| anuska   | BAHUBALI-2 | 2017     |
+-----+-----+-----+
1 row in set (0.00 sec)

```

4. Find the title of movies and number of stars for each movie that has at least one

rating and find the highest number of stars that movie received. Sort the result by movie title

```
mysql> select mov_title,max(rev_stars) from movies inner join rating using(mov_id)
group by mov_title having max(rev_stars)>0 order by mov_title;
```

mov_title	max(rev_stars)
AKASH	5
BAHUBALI-2	4
WAR HORSE	4

3 rows in set (0.00 sec)

5. Update rating of all movies directed by 'Steven Spielberg' to 5.

```
mysql> update rating set rev_stars=5 where mov_id in(select mov_id from movies where
dir_id in (select dir_id from director where dir_name='STEVEN SPIELBERG'));
Query OK, 1 row affected (0.00 sec)
Rows matched: 1 Changed: 1 Warnings: 0
```

```
mysql> select * from rating;
```

mov_id	rev_stars
1001	4
1002	2
1003	5
1004	5

4 rows in set (0.00 sec)

3. Design ERD for the following schema and execute the following Queries on it:

```
mysql> CREATE TABLE students (
->     stno INT PRIMARY KEY,
->     name VARCHAR(50),
->     addr VARCHAR(255),
->     city VARCHAR(50),
->     state VARCHAR(2),
->     zip VARCHAR(10)
-> );
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> CREATE TABLE INSTRUCTORS (
->     empno INT PRIMARY KEY,
->     name VARCHAR(50),
->     ranks VARCHAR(20),
->     roomno VARCHAR(10),
```

```

->     telno VARCHAR(15)
-> );
Query OK, 0 rows affected (0.01 sec)

```

```

mysql> CREATE TABLE COURSES (
->     cno text PRIMARY KEY,
->     cname VARCHAR(50),
->     cr INT,
->     cap INT
-> );
Query OK, 0 rows affected (0.01 sec)

```

```

mysql> CREATE TABLE GRADES (
->     stno INT,
->     empno INT,
->     cno VARCHAR(50),
->     sem VARCHAR(10),
->     year INT,
->     grade INT,
->     FOREIGN KEY (stno) REFERENCES students(stno),
->     FOREIGN KEY (empno) REFERENCES INSTRUCTORS(empno),
->     FOREIGN KEY (cno) REFERENCES COURSES(cno)
-> );
Query OK, 0 rows affected (0.02 sec)

```

```

mysql> CREATE TABLE ADVISING (
->     stno INT,
->     empno INT,
->     PRIMARY KEY (stno, empno),
->     FOREIGN KEY (stno) REFERENCES students(stno),
->     FOREIGN KEY (empno) REFERENCES INSTRUCTORS(empno)
-> );
Query OK, 0 rows affected (0.02 sec)

```

```

mysql> insert into students values
->(1011,'edwards p. david','10 red rd','newton','MA','02159')
->(2415, 'Grogan A. Mary', '8 Walnut St', 'Malden', 'MA', '02148'),
-> (2661, 'Mixon Leatha', '100 School St', 'Brookline', 'MA', '02146'),
-> (2890, 'McLane Sandy', '30 Case Rd', 'Boston', 'MA', '02122'),
-> (3442, 'Novak Roland', '42 Beacon St', 'Nashua', 'NH', '03060'),
-> (3566, 'Pierce Richard', '70 Park St', 'Brookline', 'MA', '02146'),
-> (4022, 'Prior Lorraine', '8 Beacon St', 'Boston', 'MA', '02125'),
-> (5544, 'Rawlings Jerry', '15 Pleasant Dr', 'Boston', 'MA', '02115'),
-> (5571, 'Lewis Jerry', '1 Main Rd', 'Providence', 'RI', '02904');

```

```

mysql> select * from students;

```

stno	name	addr	city	state	zip
1011	edwards p. david	10 red rd	newton	MA	02159
2415	Grogan A. Mary	8 Walnut St	Malden	MA	02148
2661	Mixon Leatha	100 School St	Brookline	MA	02146
2890	McLane Sandy	30 Case Rd	Boston	MA	02122
3442	Novak Roland	42 Beacon St	Nashua	NH	03060
3566	Pierce Richard	70 Park St	Brookline	MA	02146
4022	Prior Lorraine	8 Beacon St	Boston	MA	02125
5544	Rawlings Jerry	15 Pleasant Dr	Boston	MA	02115
5571	Lewis Jerry	1 Main Rd	Providence	RI	02904

1011	edwards p. david	10 red rd	newton	MA	02159
2415	Grogan A. Mary	8 Walnut St	Malden	MA	02148
2661	Mixon Leatha	100 School St	Brookline	MA	02146
2890	McLane Sandy	30 Case Rd	Boston	MA	02122
3442	Novak Roland	42 Beacon St	Nashua	NH	03060
3566	Pierce Richard	70 Park St	Brookline	MA	02146
4022	Prior Lorraine	8 Beacon St	Boston	MA	02125
5544	Rawlings Jerry	15 Pleasant Dr	Boston	MA	02115
5571	Lewis Jerry	1 Main Rd	Providence	RI	02904

9 rows in set (0.00 sec)

mysql> INSERT INTO instructors VALUES

```
-> (19, 'Evans Robert', 'Professor', '82', '7122'),
-> (23, 'Exxon George', 'Professor', '90', '9101'),
-> (56, 'Sawyer Kathy', 'Assoc Prof', '91', '5110'),
-> (126, 'Davis William', 'Assoc Prof', '72', '5411'),
-> (234, 'Will Samuel', 'Assist Prof', '90', '7024');
```

Query OK, 5 rows affected (0.01 sec)

Records: 5 Duplicates: 0 Warnings: 0

mysql> select * from instructors;

empno	name	ranks	roomno	telno
19	Evans Robert	Professor	82	7122
23	Exxon George	Professor	90	9101
56	Sawyer Kathy	Assoc Prof	91	5110
126	Davis William	Assoc Prof	72	5411
234	Will Samuel	Assist Prof	90	7024

5 rows in set (0.00 sec)

mysql> insert into courses values

```
-> ('cs110', 'Introduction to Computing', 4, 120),
-> ('cs210', 'Computer Programming', 4, 100),
-> ('cs240', 'Computer Architecture', 3, 100),
-> ('cs310', 'Data Structures', 3, 60),
-> ('cs350', 'Higher Level Languages', 3, 50),
-> ('cs410', 'Software Engineering', 3, 40),
-> ('cs460', 'Graphics', 3, 30);
```

Query OK, 7 rows affected (0.00 sec)

Records: 7 Duplicates: 0 Warnings: 0

mysql> select * from courses;

cno	cname	cr	cap
cs110	Introduction to Computing	4	120

cs210	Computer Programming	4	100
cs240	Computer Architecture	3	100
cs310	Data Structures	3	60
cs350	Higher Level Languages	3	50
cs410	Software Engineering	3	40
cs460	Graphics	3	30

+-----+-----+-----+-----+

7 rows in set (0.00 sec)

mysql> insert into grades values

```
-> (1011, 019, 'cs110', 'Fall', 2001, 40),
-> (2661, 019, 'cs110', 'Fall', 2001, 80),
-> (3566, 019, 'cs110', 'Fall', 2001, 95),
-> (5544, 019, 'cs110', 'Fall', 2001, 100),
-> (1011, 023, 'cs110', 'Spring', 2002, 75),
-> (4022, 023, 'cs110', 'Spring', 2002, 60),
-> (3566, 019, 'cs240', 'Spring', 2002, 100),
-> (5571, 019, 'cs240', 'Spring', 2002, 50),
-> (2415, 019, 'cs240', 'Spring', 2002, 100),
-> (3442, 234, 'cs410', 'Spring', 2002, 60),
-> (5571, 234, 'cs410', 'Spring', 2002, 80),
-> (1011, 019, 'cs210', 'Fall', 2002, 90),
-> (2661, 019, 'cs210', 'Fall', 2002, 70),
-> (3566, 019, 'cs210', 'Fall', 2002, 90),
-> (5571, 019, 'cs210', 'Spring', 2003, 85),
-> (4022, 019, 'cs210', 'Spring', 2003, 70),
-> (5544, 56, 'cs240', 'Spring', 2003, 70),
-> (1011, 56, 'cs240', 'Spring', 2003, 90),
-> (4022, 56, 'cs240', 'Spring', 2003, 80),
-> (2661, 234, 'cs310', 'Spring', 2003, 100),
-> (4022, 234, 'cs310', 'Spring', 2003, 75);
```

Query OK, 21 rows affected (0.00 sec)

Records: 21 Duplicates: 0 Warnings: 0

mysql> select * from grades;

stno	empno	cno	sem	year	grade
1011	19	cs110	Fall	2001	40
2661	19	cs110	Fall	2001	80
3566	19	cs110	Fall	2001	95
5544	19	cs110	Fall	2001	100
1011	23	cs110	Spring	2002	75
4022	23	cs110	Spring	2002	60
3566	19	cs240	Spring	2002	100
5571	19	cs240	Spring	2002	50
2415	19	cs240	Spring	2002	100
3442	234	cs410	Spring	2002	60
5571	234	cs410	Spring	2002	80
1011	19	cs210	Fall	2002	90

2661	19	cs210	Fall	2002	70
3566	19	cs210	Fall	2002	90
5571	19	cs210	Spring	2003	85
4022	19	cs210	Spring	2003	70
5544	56	cs240	Spring	2003	70
1011	56	cs240	Spring	2003	90
4022	56	cs240	Spring	2003	80
2661	234	cs310	Spring	2003	100
4022	234	cs310	Spring	2003	75

+-----+-----+-----+-----+-----+-----+
21 rows in set (0.00 sec)

mysql> insert into advising values

-> (1011,019);
-> (2415,019),
-> (2661,0023),
-> (2890,023),
-> (3442,0056),
-> (3566,126),
-> (4022,234),
-> (5544,023),
-> (5571,234);

Query OK, 8 rows affected (0.00 sec)

Records: 8 Duplicates: 0 Warnings: 0

mysql> select * from advising;

stno	empno
1011	19
2415	19
2661	23
2890	23
5544	23
3442	56
3566	126
4022	234
5571	234

+-----+-----+
+-----+-----+

9 rows in set (0.00 sec)

#Queries

1. Find the names of students who took only four-credit courses.

mysql> SELECT DISTINCT s.name

-> FROM students s
-> JOIN grades g ON s.stno = g.stno
-> JOIN courses c ON g.cno = c.cno
-> WHERE c.cr = 4

```

-> AND g.cno NOT IN (
->     SELECT cno
->     FROM courses
->     WHERE cr != 4
-> );

```

```

+-----+
| name   |
+-----+
| edwards p. david |
| Mixon Leatha     |
| Pierce Richard   |
| Rawlings Jerry   |
| Prior Lorraine   |
| Lewis Jerry      |
+-----+

```

6 rows in set (0.00 sec)

2. Find the names of students who took no four-credit courses.

```

mysql> SELECT DISTINCT s.name
-> FROM students s
-> WHERE s.stno NOT IN (
->     SELECT DISTINCT g.stno
->     FROM grades g
->     JOIN courses c ON g.cno = c.cno
->     WHERE c.cr = 4
-> );

```

```

+-----+
| name   |
+-----+
| Grogan A. Mary |
| McLane Sandy   |
| Novak Roland   |
+-----+

```

3 rows in set (0.00 sec)

3. Find the names of students who took cs210 or cs310

```

mysql> select name from students where stno in (select stno from grades where
cno='cs210' or cno='cs310');

```

```

+-----+
| name   |
+-----+
| edwards p. david |
| Mixon Leatha     |
| Pierce Richard   |
| Prior Lorraine   |
| Lewis Jerry      |
+-----+

```

5 rows in set (0.00 sec)

4. Find names of all students who have a cs210 grade higher than the highest grade given in cs310 and did not take any course with Prof. Evans.

```
mysql> SELECT s.name
-> FROM students s
-> WHERE s.stno IN (
->     SELECT g1.stno
->     FROM grades g1
->     WHERE g1.cno = 'cs210'
->           AND g1.grade > (
->               SELECT MAX(g2.grade)
->               FROM grades g2
->               WHERE g2.cno = 'cs310'
->           )
-> )
-> AND s.stno NOT IN (
->     SELECT g3.stno
->     FROM grades g3
->     JOIN instructors i ON g3.empno = i.empno
->     WHERE i.name = 'Evans Robert'
-> );
Empty set (0.00 sec)
```

5.. Find course numbers for courses that enrol at least two students, solve the same query for courses that enroll at least three students

```
mysql> SELECT cno
-> FROM grades
-> GROUP BY cno
-> HAVING COUNT(DISTINCT stno) >= 2;
+-----+
| cno  |
+-----+
| cs110 |
| cs210 |
| cs240 |
| cs310 |
| cs410 |
+-----+
5 rows in set (0.00 sec)
```

```
mysql> SELECT cno
-> FROM grades
-> GROUP BY cno
-> HAVING COUNT(DISTINCT stno) >= 3;
+-----+
| cno  |
+-----+
| cs110 |
+-----+
```

```
| cs210 |
| cs240 |
+-----+
```

3 rows in set (0.00 sec)

6. Find the names of students who obtained the highest grade in cs210.

```
mysql> SELECT s.name
-> FROM students s
-> JOIN grades g ON s.stno = g.stno
-> WHERE g.cno = 'cs210' AND g.grade = (SELECT MAX(grade) FROM grades WHERE cno
= 'cs210');
```

```
+-----+
| name          |
+-----+
| edwards p. david |
| Pierce Richard |
+-----+
```

2 rows in set (0.00 sec)

7. Find course numbers for courses that enroll exactly two students;

```
mysql> SELECT cno
-> FROM grades
-> GROUP BY cno
-> HAVING COUNT(DISTINCT stno) = 2;
```

```
+-----+
| cno  |
+-----+
| cs310 |
| cs410 |
+-----+
```

2 rows in set (0.00 sec)

8. Find the names of all students for whom no other student lives in the same city.

```
mysql> SELECT DISTINCT s1.name
-> FROM students s1
-> WHERE NOT EXISTS (
->     SELECT 1
->     FROM students s2
->     WHERE s2.city = s1.city AND s2.stno <> s1.stno
-> );
```

```
+-----+
| name          |
+-----+
| edwards p. david |
| Grogan A. Mary  |
| Novak Roland    |
| Lewis Jerry     |
+-----+
```



```
+-----+
4 rows in set (0.00 sec)
```

9. Find the names of students whose advisor did not teach them any course

```
mysql> SELECT s.name
-> FROM students s
-> WHERE NOT EXISTS (
->     SELECT 1
->     FROM advising a
->     WHERE a.stno = s.stno
->     AND NOT EXISTS (
->         SELECT 1
->         FROM grades g
->         WHERE g.stno = a.stno
->             AND g.empno = a.empno
->     )
-> );
```

```
+-----+
| name          |
+-----+
| edwards p. david |
| Grogan A. Mary  |
| Prior Lorraine  |
| Lewis Jerry     |
+-----+
```

```
4 rows in set (0.00 sec)
```

10. Find the highest grade of a student who never took cs110

```
mysql> SELECT MAX(grade) AS highest_grade
-> FROM grades
-> WHERE stno NOT IN (
->     SELECT stno
->     FROM grades
->     WHERE cno = 'cs110'
-> );
```

```
+-----+
| highest_grade |
+-----+
|          100 |
+-----+
```

```
1 row in set (0.00 sec)
```