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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)

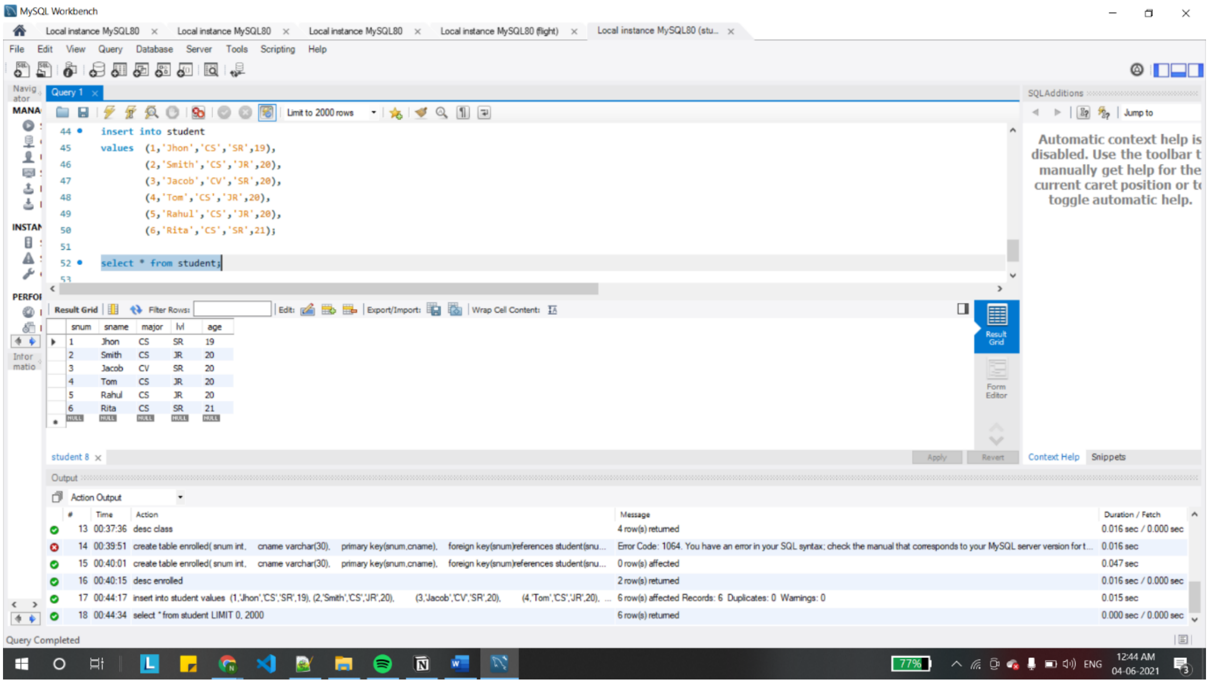
FACULTY(fid: integer, fname:string, deptid: integer)

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

TABLES:

1.student



```
insert into student
values  (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);

select * from student;
```

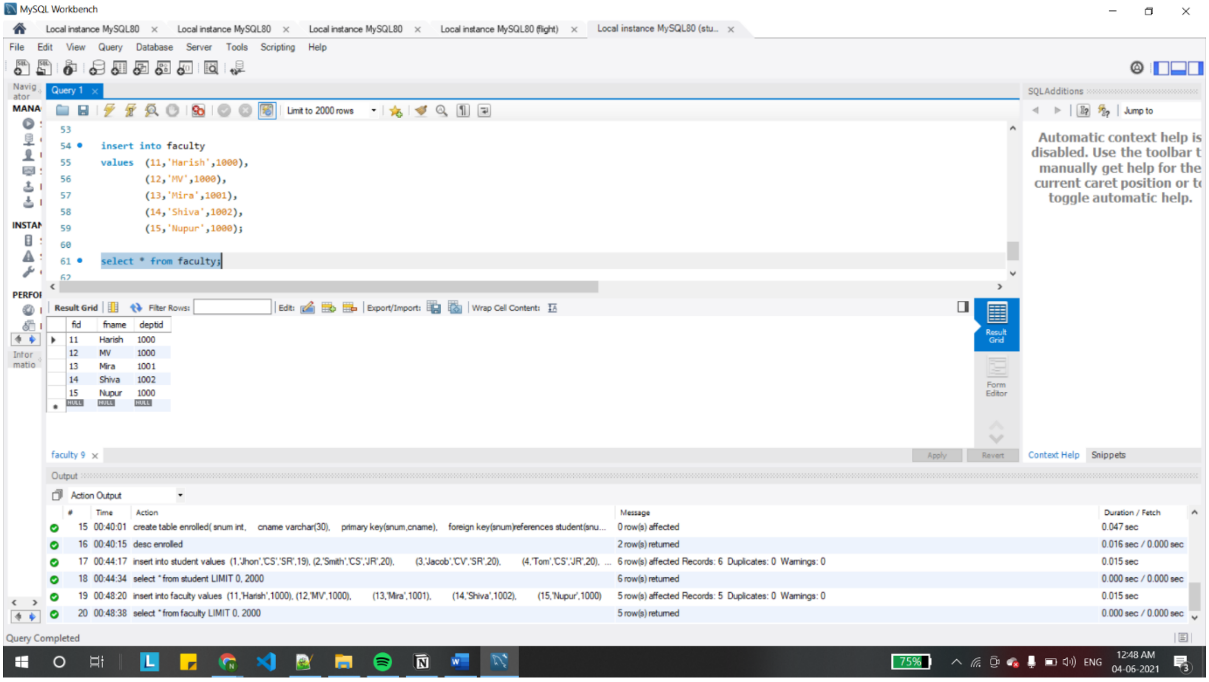
Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

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

```
#   Time      Action                                                                                                      Message                                                                                                   Duration / Fetch
13  00:37:36  desc class                                                                                                  4 row(s) returned                                                                                         0.016 sec / 0.000 sec
14  00:39:51  create table enrolled( snum int,   cname varchar(30),   primary key(snum,cname),   foreign key(snum)references student(snu...   Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...   0.016 sec
15  00:40:01  create table enrolled( snum int,   cname varchar(30),   primary key(snum,cname),   foreign key(snum)references student(snu...   0 row(s) affected                                                                                         0.047 sec
16  00:40:15  desc enrolled                                                                                               2 row(s) returned                                                                                         0.016 sec / 0.000 sec
17  00:44:17  insert into student values  (1,'Jhon','CS','SR',19), (2,'Smith','CS','JR',20),   (3,'Jacob','CV','SR',20),   (4,'Tom','CS','JR',20), ...   6 row(s) affected Records: 6  Duplicates: 0  Warnings: 0   0.015 sec
18  00:44:34  select * from student LIMIT 0, 2000                                                                         6 row(s) returned                                                                                         0.000 sec / 0.000 sec
```

Query Completed

2.faculty



```
insert into faculty
values  (11,'Harish',1000),
        (12,'MV',1000),
        (13,'Mira',1001),
        (14,'Shiva',1002),
        (15,'Nupur',1000);

select * from faculty;
```

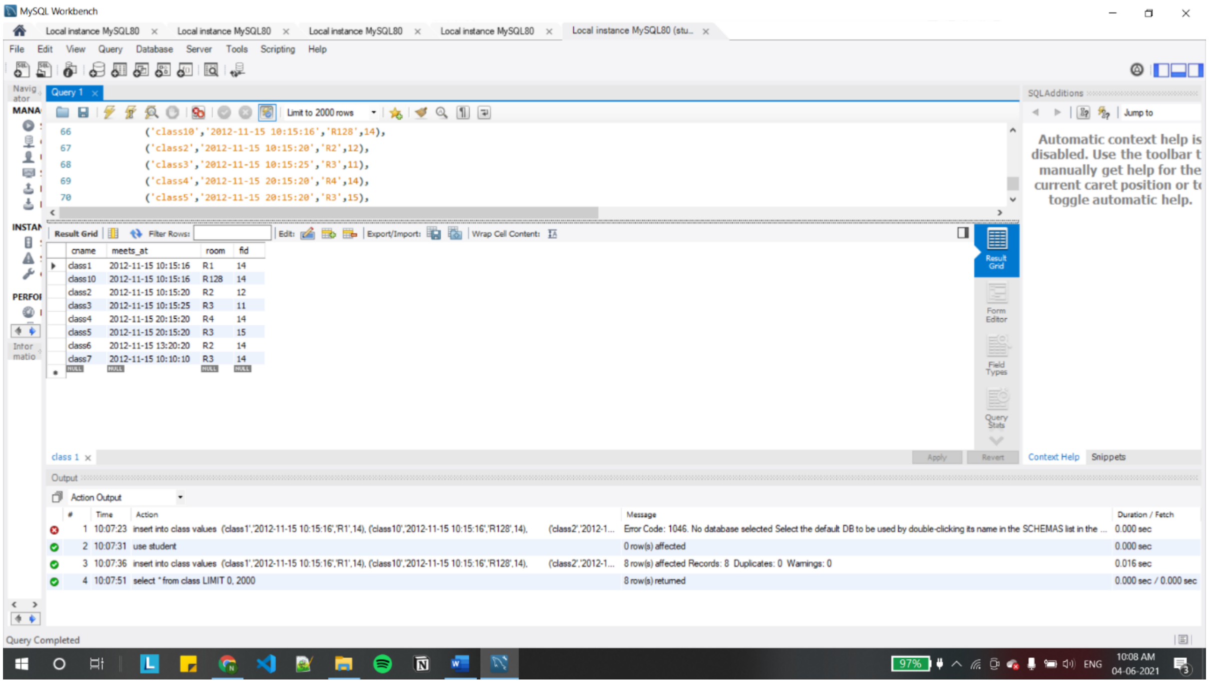
Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

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

```
#   Time      Action                                                                                                      Message                                                    Duration / Fetch
15  00:40:01  create table enrolled( snum int,   cname varchar(30),   primary key(snum,cname),   foreign key(snum)references student(snu...   0 row(s) affected                                          0.047 sec
16  00:40:15  desc enrolled                                                                                               2 row(s) returned                                          0.016 sec / 0.000 sec
17  00:44:17  insert into student values  (1,'Jhon','CS','SR',19), (2,'Smith','CS','JR',20),   (3,'Jacob','CV','SR',20),   (4,'Tom','CS','JR',20), ...   6 row(s) affected Records: 6  Duplicates: 0  Warnings: 0   0.015 sec
18  00:44:34  select * from student LIMIT 0, 2000                                                                         6 row(s) returned                                          0.000 sec / 0.000 sec
19  00:48:20  insert into faculty values  (11,'Harish',1000), (12,'MV',1000),   (13,'Mira',1001),   (14,'Shiva',1002),   (15,'Nupur',1000)   5 row(s) affected Records: 5  Duplicates: 0  Warnings: 0   0.015 sec
20  00:48:38  select * from faculty LIMIT 0, 2000                                                                         5 row(s) returned                                          0.000 sec / 0.000 sec
```

Query Completed

3.class



```
('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),
```

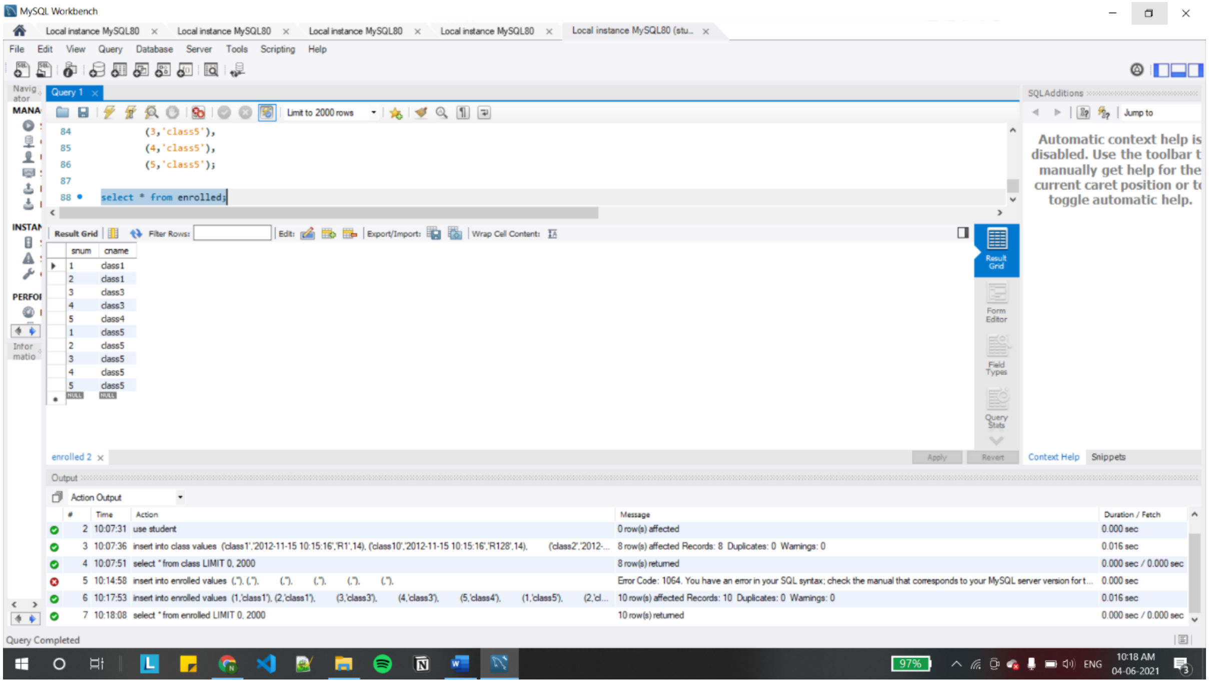
cname	meets_at	room	fid
class1	2012-11-15 10:15:16	R1	14
class10	2012-11-15 10:15:16	R128	14
class2	2012-11-15 10:15:20	R2	12
class3	2012-11-15 10:15:25	R3	11
class4	2012-11-15 20:15:20	R4	14
class5	2012-11-15 20:15:20	R3	15
class6	2012-11-15 13:20:20	R2	14
class7	2012-11-15 10:10:10	R3	14
NULL	NULL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

Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

```
#  Time      Action                                                                                                   Message                                                                                              Duration / Fetch
1  10:07:23  insert into class values ('class1','2012-11-15 10:15:16','R1',14), ('class10','2012-11-15 10:15:16','R128',14),   ('class2','2012-1...  Error Code: 1046. No database selected Select the default DB to be used by double-clicking its name in the SCHEMAS list in the ...  0.000 sec
2  10:07:31  use student                                                                                              0 row(s) affected                                                                                    0.000 sec
3  10:07:36  insert into class values ('class1','2012-11-15 10:15:16','R1',14), ('class10','2012-11-15 10:15:16','R128',14),   ('class2','2012-1...  8 row(s) affected Records: 8  Duplicates: 0  Warnings: 0       0.016 sec
4  10:07:51  select * from class LIMIT 0, 2000                                                                        8 row(s) returned                                                                                    0.000 sec / 0.000 sec
```

Query Completed

4.enrolled



```
                (3,'class5'),
                (4,'class5'),
                (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

Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

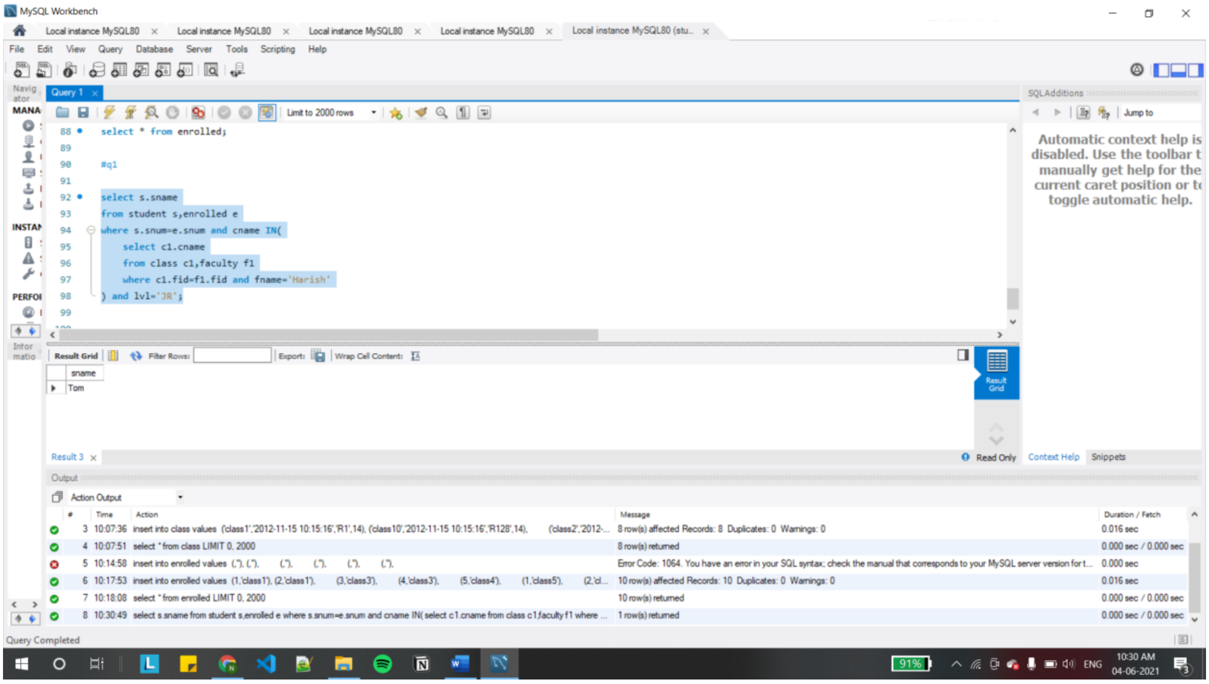
```
#  Time      Action                                                                                                   Message                                                                                              Duration / Fetch
2  10:07:31  use student                                                                                              0 row(s) affected                                                                                    0.000 sec
3  10:07:36  insert into class values ('class1','2012-11-15 10:15:16','R1',14), ('class10','2012-11-15 10:15:16','R128',14),   ('class2','2012-...  8 row(s) affected Records: 8  Duplicates: 0  Warnings: 0       0.016 sec
4  10:07:51  select * from class LIMIT 0, 2000                                                                        8 row(s) returned                                                                                    0.000 sec / 0.000 sec
5  10:14:58  insert into enrolled values (,''), (,''),   (,''),   (,''),   (,''),   (,''),                            Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...  0.000 sec
6  10:17:53  insert into enrolled values (1,'class1'), (2,'class1'),   (3,'class3'),   (4,'class3'),   (5,'class4'),   (1,'class5'),   (2,'cl...  10 row(s) affected Records: 10  Duplicates: 0  Warnings: 0   0.016 sec
7  10:18:08  select * from enrolled LIMIT 0, 2000                                                                     10 row(s) returned                                                                                   0.000 sec / 0.000 sec
```

Query Completed

QUERIES:

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

```
select s.sname
from student s,enrolled e
where s.snum=e.snum and cname IN(
            select c1.cname
            from class c1,faculty f1
            where c1.fid=f1.fid and fname='Harish'
) and lvl='JR';
```



```
select * from enrolled;

#q1

select s.sname
from student s,enrolled e
where s.snum=e.snum and cname IN(
    select c1.cname
    from class c1,faculty f1
    where c1.fid=f1.fid and fname='Harish'
) and lvl='JR';
```

Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

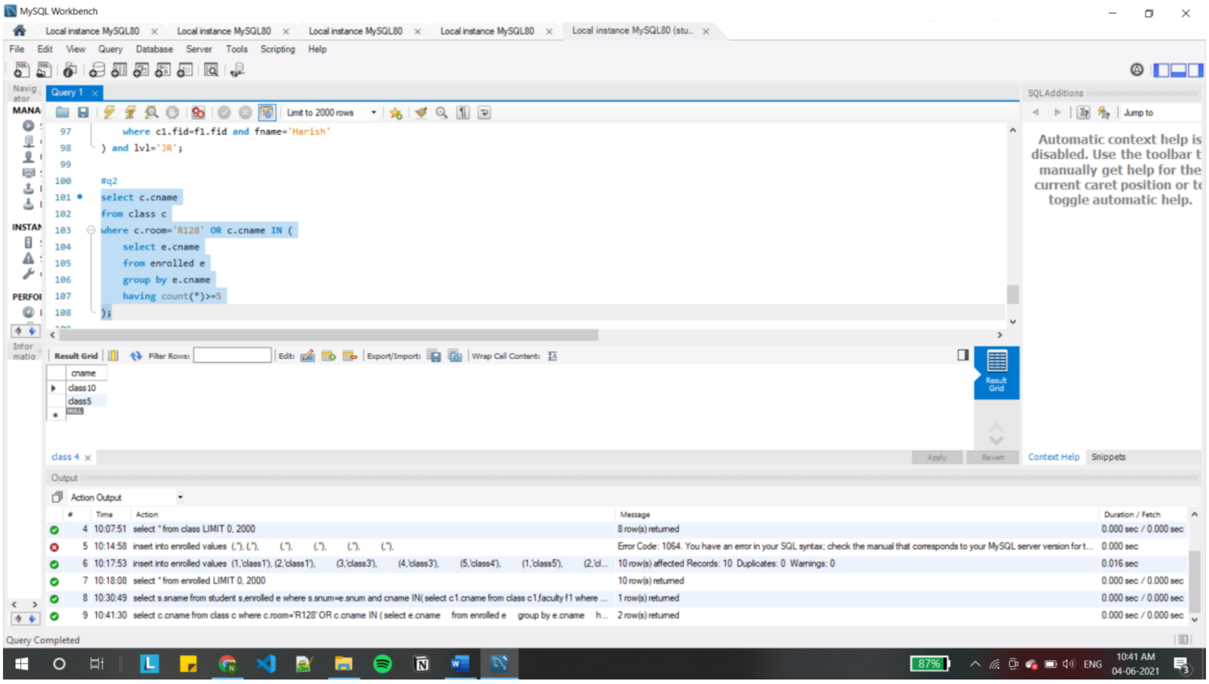
	sname
▶	Tom

```
#  Time      Action                                                                                                   Message                                                                                             Duration / Fetch
3  10:07:36  insert into class values ('class1','2012-11-15 10:15:16','R1',14), ('class10','2012-11-15 10:15:16','R128',14),   ('class2','2012-...  8 row(s) affected Records: 8  Duplicates: 0  Warnings: 0       0.016 sec
4  10:07:51  select * from class LIMIT 0, 2000                                                                         8 row(s) returned                                                                                   0.000 sec / 0.000 sec
5  10:14:58  insert into enrolled values (,''), (,''),   (,''),   (,''),   (,''),   (,'').                               Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...   0.000 sec
6  10:17:53  insert into enrolled values (1,'class1'), (2,'class1'),   (3,'class3'),   (4,'class3'),   (5,'class4'),   (1,'class5'),   (2,'cl...   10 row(s) affected Records: 10  Duplicates: 0  Warnings: 0   0.016 sec
7  10:18:08  select * from enrolled LIMIT 0, 2000                                                                      10 row(s) returned                                                                                  0.000 sec / 0.000 sec
8  10:30:49  select s.sname from student s,enrolled e where s.snum=e.snum and cname IN( select c1.cname from class c1,faculty f1 where ...   1 row(s) returned                                              0.000 sec / 0.000 sec
```

Query Completed

2.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
);
```



```
        where c1.fid=f1.fid and fname='Harish'
    ) and lvl='JR';

#q2
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
);
```

Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

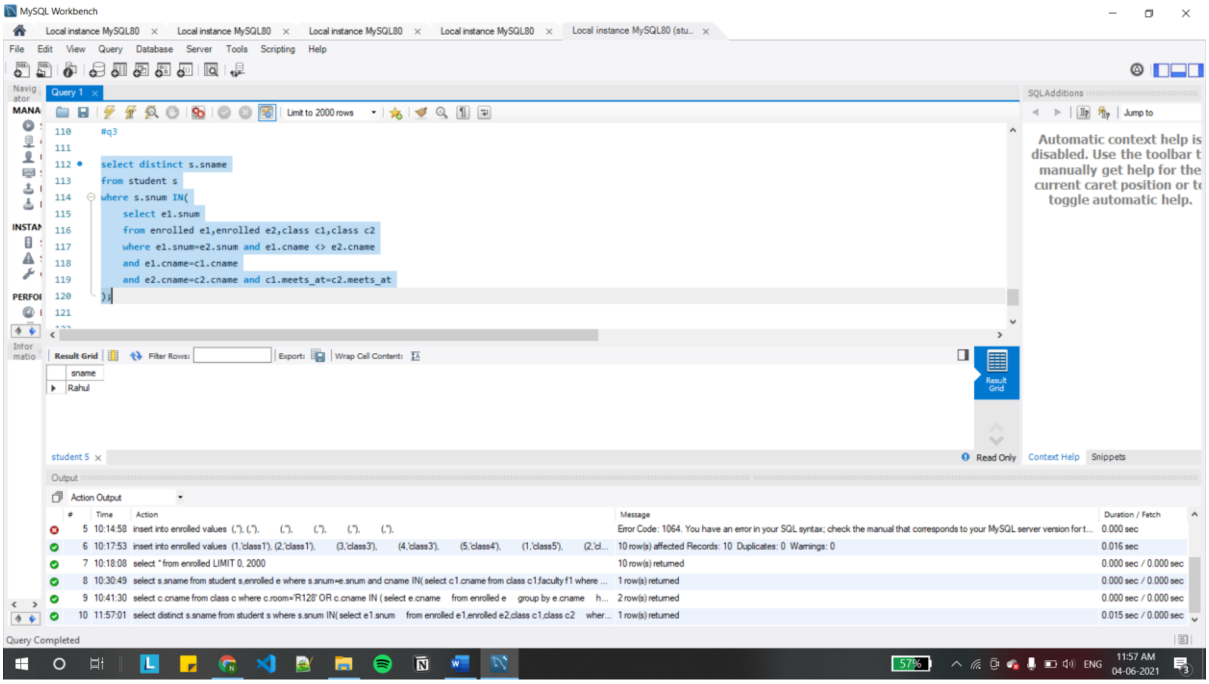
cname
class10
class5
NULL

class 4

#	Time	Action	Message	Duration / Fetch
4	10:07:51	select * from class LIMIT 0, 2000	8 row(s) returned	0.000 sec / 0.000 sec
5	10:14:58	insert into enrolled values (,''), (,''), (,''), (,''), (,''), (,''),	Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...	0.000 sec
6	10:17:53	insert into enrolled values (1,'class1'), (2,'class1'), (3,'class3'), (4,'class3'), (5,'class4'), (1,'class5'), (2,'cl...	10 row(s) affected Records: 10 Duplicates: 0 Warnings: 0	0.016 sec
7	10:18:08	select * from enrolled LIMIT 0, 2000	10 row(s) returned	0.000 sec / 0.000 sec
8	10:30:49	select s.sname from student s,enrolled e where s.snum=e.snum and cname IN(select c1.cname from class c1,faculty f1 where ...	1 row(s) returned	0.000 sec / 0.000 sec
9	10:41:30	select c.cname from class c where c.room='R128' OR c.cname IN (select e.cname from enrolled e group by e.cname h...	2 row(s) returned	0.000 sec / 0.000 sec

3.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.meets_at=c2.meets_at
);



```
#q3

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.meets_at=c2.meets_at
);
```

Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

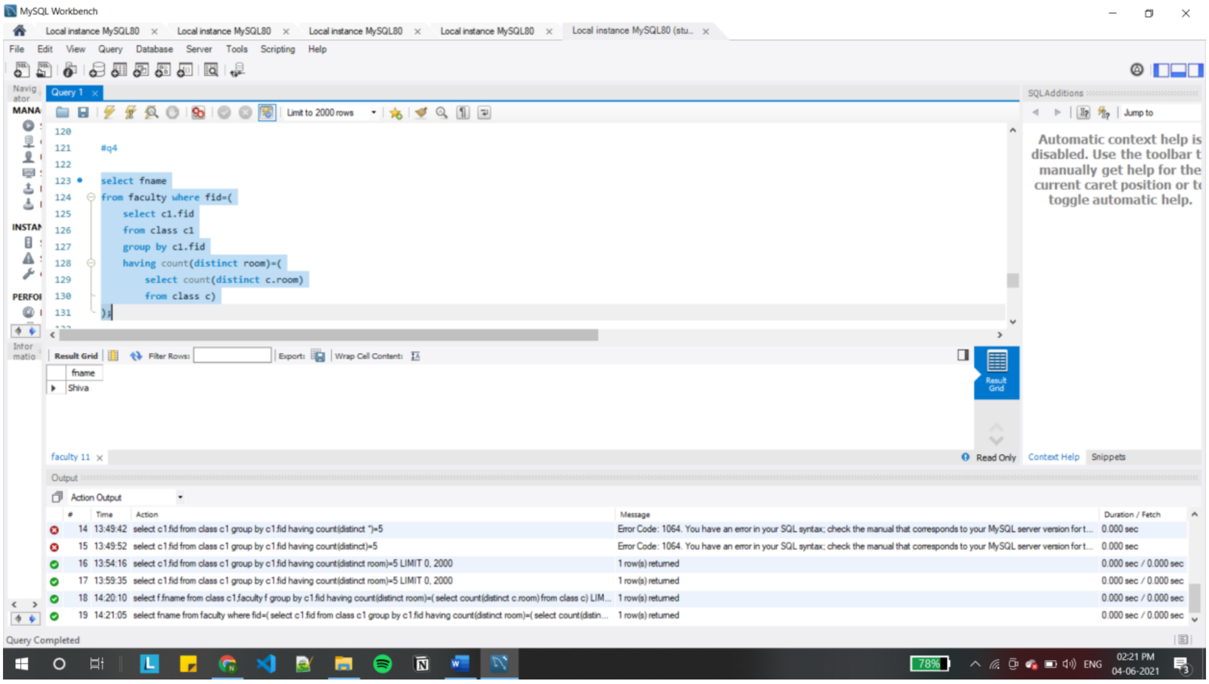
sname
Rahul

student 5

#	Time	Action	Message	Duration / Fetch
5	10:14:58	insert into enrolled values (,''), (,''), (,''), (,''), (,''), (,''),	Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...	0.000 sec
6	10:17:53	insert into enrolled values (1,'class1'), (2,'class1'), (3,'class3'), (4,'class3'), (5,'class4'), (1,'class5'), (2,'cl...	10 row(s) affected Records: 10 Duplicates: 0 Warnings: 0	0.016 sec
7	10:18:08	select * from enrolled LIMIT 0, 2000	10 row(s) returned	0.000 sec / 0.000 sec
8	10:30:49	select s.sname from student s,enrolled e where s.snum=e.snum and cname IN(select c1.cname from class c1,faculty f1 where ...	1 row(s) returned	0.000 sec / 0.000 sec
9	10:41:30	select c.cname from class c where c.room='R128' OR c.cname IN (select e.cname from enrolled e group by e.cname h...	2 row(s) returned	0.000 sec / 0.000 sec
10	11:57:01	select distinct s.sname from student s where s.snum IN(select e1.snum from enrolled e1,enrolled e2,class c1,class c2 wher...	1 row(s) returned	0.015 sec / 0.000 sec

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

```
select fname
from faculty where fid=(
        select c1.fid
        from class c1
        group by c1.fid
        having count(distinct room)=(
                select count(distinct c.room)
                from class c)
);
```



```
#q4

select fname
from faculty where fid=(
    select c1.fid
    from class c1
    group by c1.fid
    having count(distinct room)=(
        select count(distinct c.room)
        from class c)
);
```

Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or to toggle automatic help.

	fname
▸	Shiva

```
#   Time      Action                                                                                             Message                                                                           Duration / Fetch
14  13:49:42  select c1.fid from class c1 group by c1.fid having count(distinct ")=5                               Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...  0.000 sec
15  13:49:52  select c1.fid from class c1 group by c1.fid having count(distinct)=5                                 Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...  0.000 sec
16  13:54:16  select c1.fid from class c1 group by c1.fid having count(distinct room)=5 LIMIT 0, 2000              1 row(s) returned                                                                 0.000 sec / 0.000 sec
17  13:59:35  select c1.fid from class c1 group by c1.fid having count(distinct room)=5 LIMIT 0, 2000              1 row(s) returned                                                                 0.000 sec / 0.000 sec
18  14:20:10  select f.fname from class c1,faculty f group by c1.fid having count(distinct room)=( select count(distinct c.room) from class c) LIM...  1 row(s) returned              0.000 sec / 0.000 sec
19  14:21:05  select fname from faculty where fid=( select c1.fid from class c1 group by c1.fid having count(distinct room)=( select count(distin...  1 row(s) returned        0.000 sec / 0.000 sec
```

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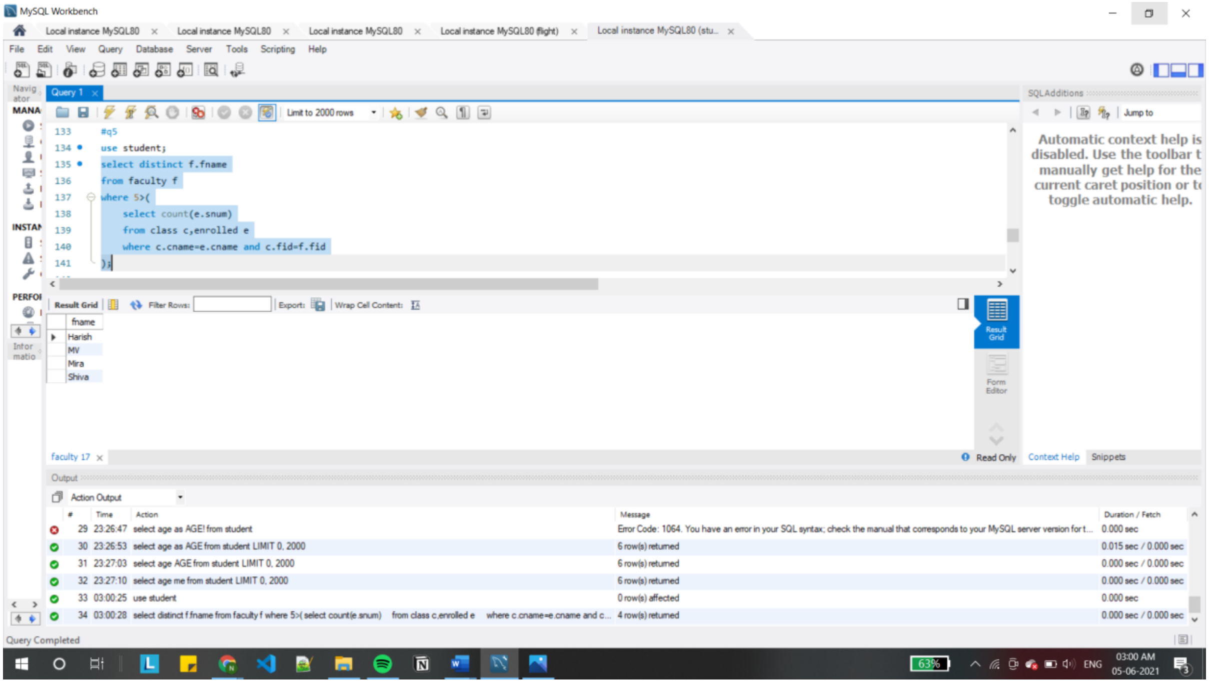
5.Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than five.

```
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
);
```



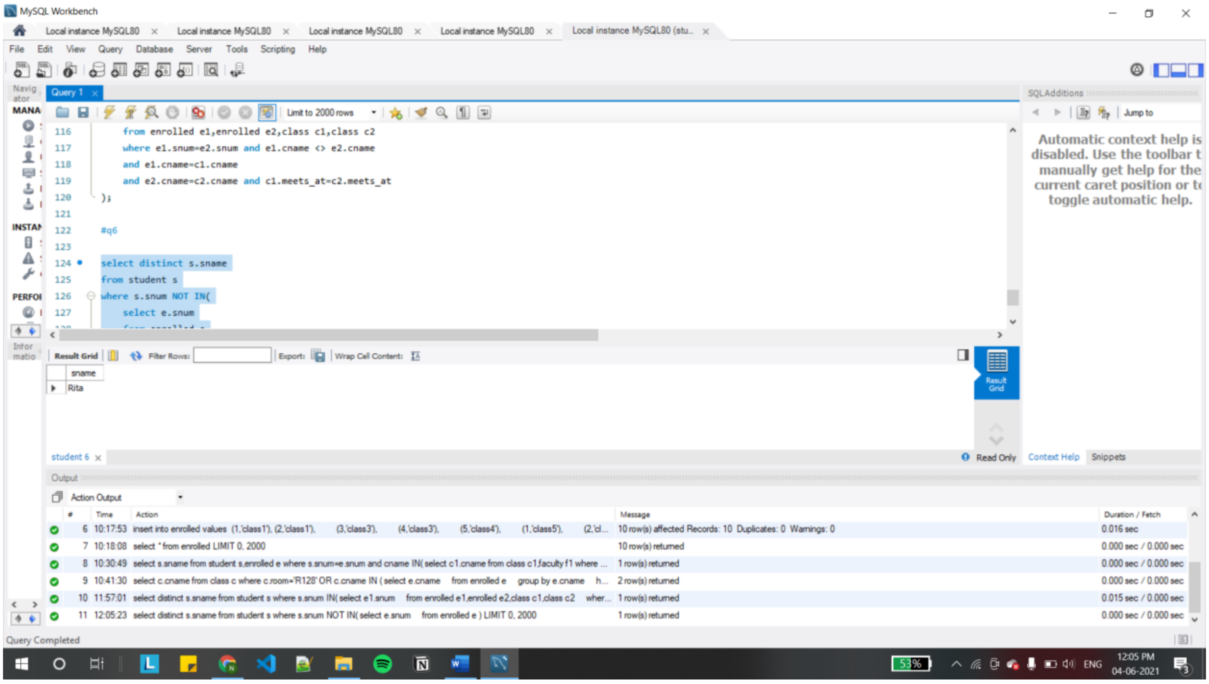
```
#q5
use student;
select distinct f.fname
from faculty f
where 5>(
    select count(e.snum)
    from class c,enrolled e
    where c.cname=e.cname and c.fid=f.fid
);
```

	fname
▸	Harish
	MV
	Mira
	Shiva

```
#   Time      Action                                                                   Message                                                                                    Duration / Fetch
29  23:26:47  select age as AGE! from student                                          Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...  0.000 sec
30  23:26:53  select age as AGE from student LIMIT 0, 2000                             6 row(s) returned                                                                          0.015 sec / 0.000 sec
31  23:27:03  select age AGE from student LIMIT 0, 2000                                6 row(s) returned                                                                          0.000 sec / 0.000 sec
32  23:27:10  select age me from student LIMIT 0, 2000                                 6 row(s) returned                                                                          0.000 sec / 0.000 sec
33  03:00:25  use student                                                              0 row(s) affected                                                                          0.000 sec
34  03:00:28  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...  4 row(s) returned   0.000 sec / 0.000 sec
```

6.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
);



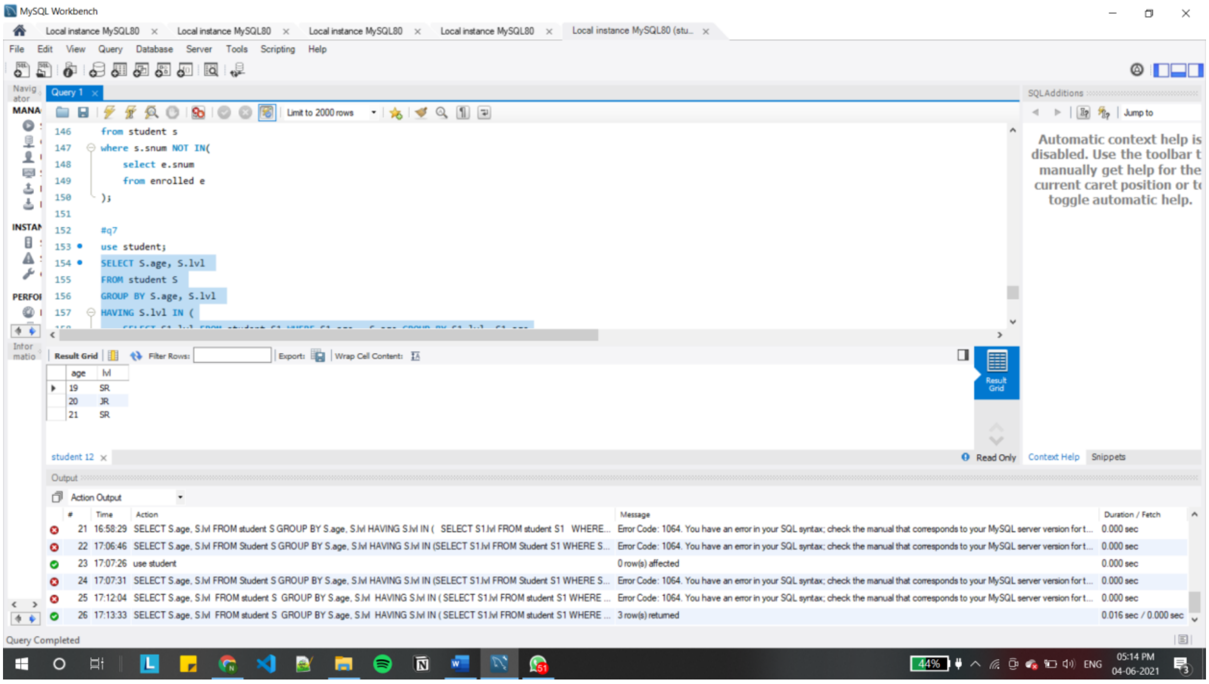
```
    from enrolled e1,enrolled e2,class c1,class c2
    where e1.snum=e2.snum and e1.cname <> e2.cname
    and e1.cname=c1.cname
    and e2.cname=c2.cname and c1.meets_at=c2.meets_at
);

#q6

select distinct s.sname
from student s
where s.snum NOT IN(
    select e.snum
```

	sname
▸	Rita

```
#   Time      Action                                                                                                   Message                                                          Duration / Fetch
6   10:17:53  insert into enrolled values (1,'class1'), (2,'class1'),    (3,'class3'),    (4,'class3'),    (5,'class4'),    (1,'class5'),    (2,'cl...  10 row(s) affected Records: 10  Duplicates: 0  Warnings: 0   0.016 sec
7   10:18:08  select * from enrolled LIMIT 0, 2000                                                             10 row(s) returned                                               0.000 sec / 0.000 sec
8   10:30:49  select s.sname from student s,enrolled e where s.snum=e.snum and cname IN( select c1.cname from class c1,faculty f1 where ...  1 row(s) returned   0.000 sec / 0.000 sec
9   10:41:30  select c.cname from class c where c.room='R128' OR c.cname IN ( select e.cname    from enrolled e    group by e.cname    h...  2 row(s) returned   0.000 sec / 0.000 sec
10  11:57:01  select distinct s.sname from student s where s.snum IN( select e1.snum    from enrolled e1,enrolled e2,class c1,class c2    wher...  1 row(s) returned   0.015 sec / 0.000 sec
11  12:05:23  select distinct s.sname from student s where s.snum NOT IN( select e.snum    from enrolled e ) LIMIT 0, 2000   1 row(s) returned   0.000 sec / 0.000 sec
```

7.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).

```
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)

);
```



```
from student s
where s.snum NOT IN(
    select e.snum
    from enrolled e
);

#q7
use student;
SELECT S.age, S.lvl
FROM student S
GROUP BY S.age, S.lvl
HAVING S.lvl IN (
```

age	lvl
19	SR
20	JR
21	SR

Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

```
#   Time      Action                                                                                          Message                                                                                          Duration / Fetch
21  16:58:29  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...  Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...  0.000 sec
22  17:06:46  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 S...  Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...  0.000 sec
23  17:07:26  use student                                                                                     0 row(s) affected                                                                                0.000 sec
24  17:07:31  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 S...  Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...  0.000 sec
25  17:12:04  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 ...  Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for t...  0.000 sec
26  17:13:33  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 ...  3 row(s) returned                                                                                0.016 sec / 0.000 sec
```