

TRISHUL M

D1

20/05/2021

Student faculty

```
CREATE DATABASE student_faculty;
```

```
USE student_faculty;
```

```
CREATE TABLE student(  
    snum INT,  
    sname VARCHAR(10),  
    major VARCHAR(2),  
    lvl VARCHAR(2),  
    age INT, primary key(snum));
```

```
CREATE TABLE faculty(  
    fid INT,fname VARCHAR(20),  
    deptid INT,  
    PRIMARY KEY(fid));
```

```
CREATE TABLE class(  
    cname VARCHAR(20),  
    metts_at TIMESTAMP,  
    room VARCHAR(10),  
    fid INT,  
    PRIMARY KEY(cname),  
    FOREIGN KEY(fid) REFERENCES faculty(fid));
```

```
CREATE TABLE enrolled(  
    snum INT,  
    cname VARCHAR(20),  
    PRIMARY KEY(snum,cname),  
    FOREIGN KEY(snum) REFERENCES student(snum),  
    FOREIGN KEY(cname) REFERENCES class(cname));
```

```

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);

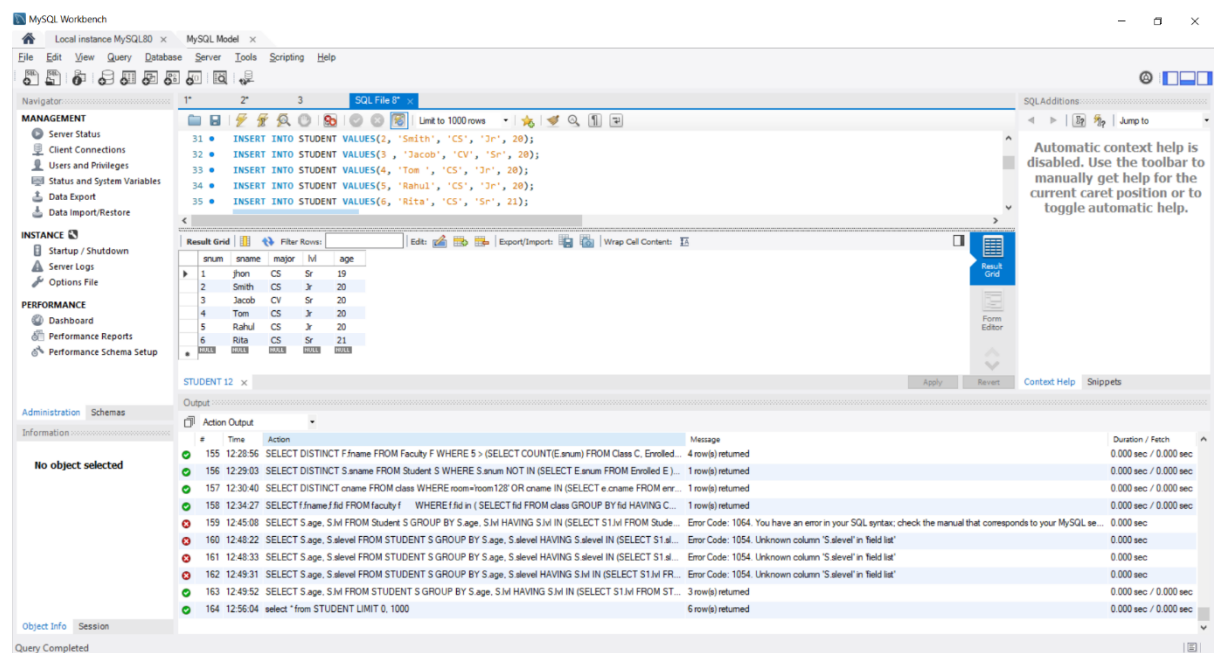
INSERT INTO STUDENT VALUES(4, 'Tom ', 'CS', 'Jr', 20);

INSERT INTO STUDENT VALUES(5, 'Rahul', 'CS', 'Jr', 20);

INSERT INTO STUDENT VALUES(6, 'Rita', 'CS', 'Sr', 21);

select * from STUDENT;

```



```

INSERT INTO FACULTY VALUES(11, 'Harish', 1000);

INSERT INTO FACULTY VALUES(12, 'MV', 1000);

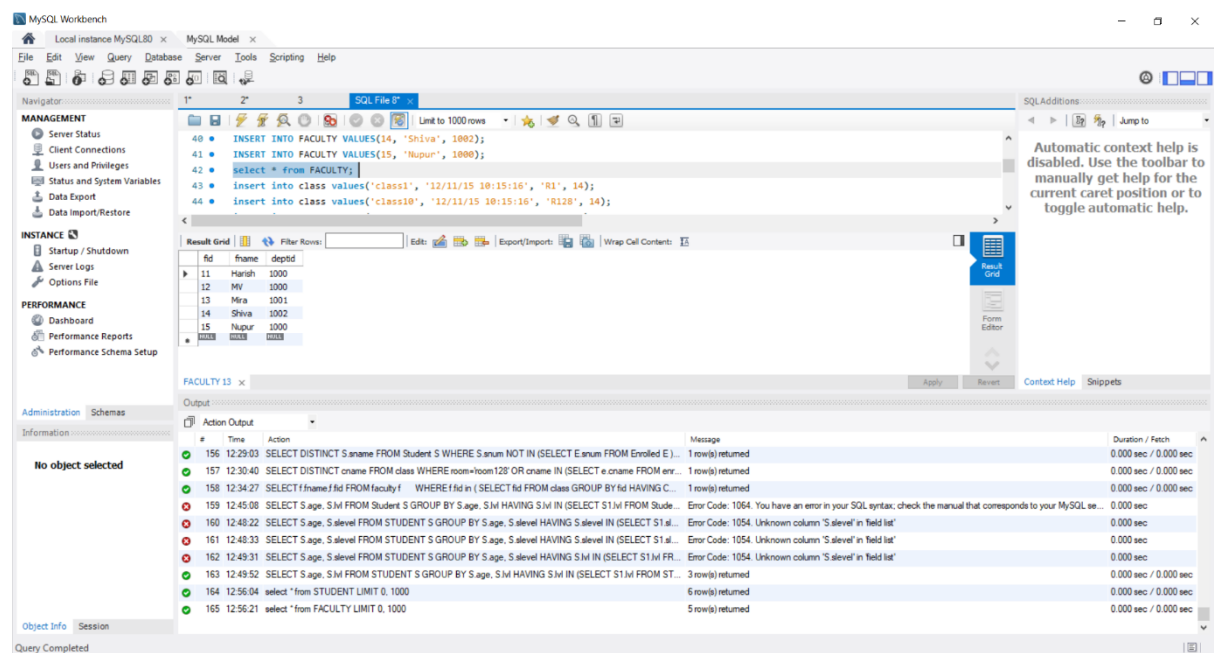
INSERT INTO FACULTY VALUES(13, 'Mira', 1001);

INSERT INTO FACULTY VALUES(14, 'Shiva', 1002);

INSERT INTO FACULTY VALUES(15, 'Nupur', 1000);

select * from FACULTY;

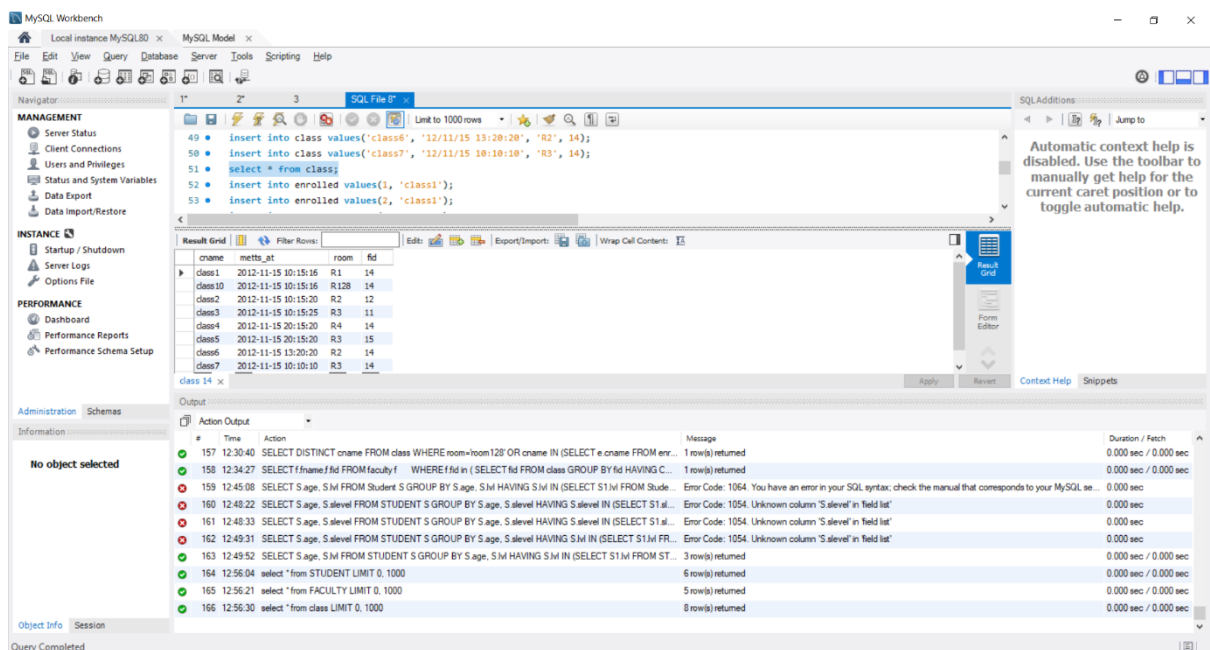
```



```

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', 11);
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;

```



```

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');

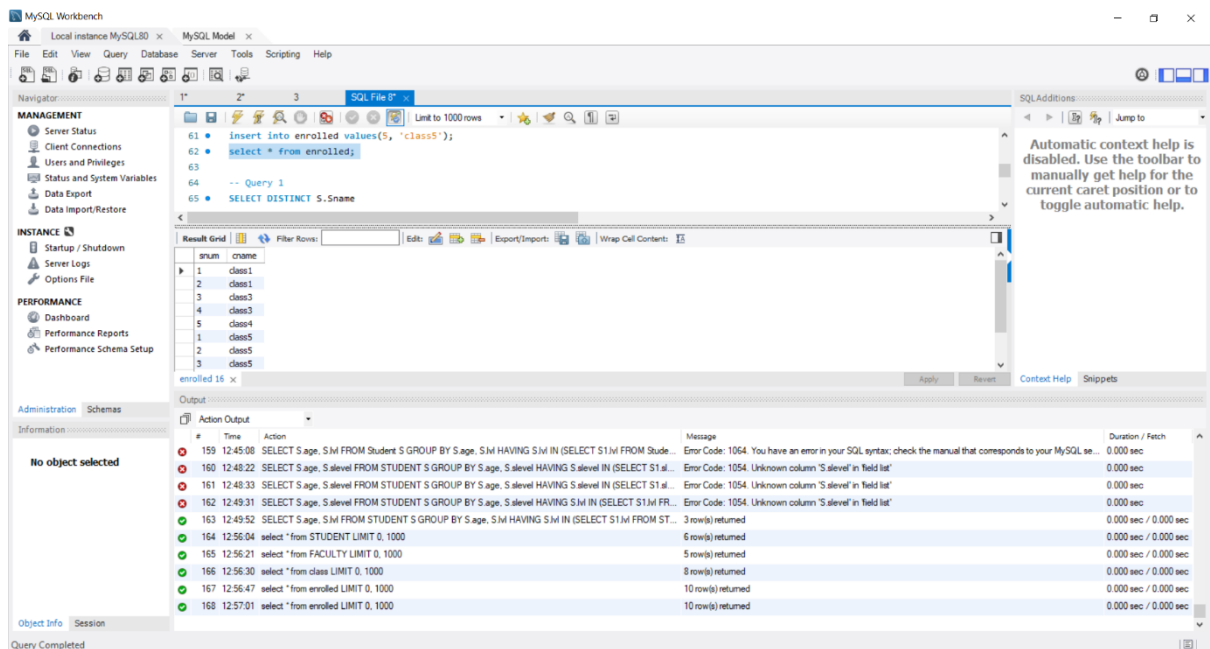
insert into enrolled values(3, 'class5');

insert into enrolled values(4, 'class5');

insert into enrolled values(5, 'class5');

select * from enrolled;

```



-- Query 1

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';

The screenshot displays the MySQL Workbench interface. The central editor shows the following SQL query:

```
-- Query 1
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';
```

The left sidebar contains the 'MANAGEMENT' and 'INSTANCE' sections. The 'MANAGEMENT' section includes 'Server Status', 'Client Connections', 'Users and Privileges', 'Status and System Variables', 'Data Export', and 'Data Import/Restore'. The 'INSTANCE' section includes 'Startup / Shutdown', 'Server Logs', and 'Options File'. The 'PERFORMANCE' section includes 'Dashboard', 'Performance Reports', and 'Performance Schema Setup'. The 'Administration' section includes 'Schemas' and 'Information'. The 'Information' section shows 'No object selected'.

The bottom panel shows the 'Output' tab with a table of execution results:

Time	Action	Message	Duration / Fetch
160 12:48:22	SELECT S.age, S.slevel FROM STUDENT S GROUP BY S.age, S.slevel HAVING S.slevel IN (SELECT S1.slevel FROM STUDENT S1 WHERE S1.slevel < S.slevel)	Error Code: 1054. Unknown column 'S.slevel' in 'field list'	0.000 sec
161 12:48:33	SELECT S.age, S.slevel FROM STUDENT S GROUP BY S.age, S.slevel HAVING S.slevel IN (SELECT S1.slevel FROM STUDENT S1 WHERE S1.slevel < S.slevel)	Error Code: 1054. Unknown column 'S.slevel' in 'field list'	0.000 sec
162 12:49:31	SELECT S.age, S.slevel FROM STUDENT S GROUP BY S.age, S.slevel HAVING S.slevel IN (SELECT S1.slevel FROM STUDENT S1 WHERE S1.slevel < S.slevel)	Error Code: 1054. Unknown column 'S.slevel' in 'field list'	0.000 sec
163 12:49:52	SELECT S.age, S.slevel FROM STUDENT S GROUP BY S.age, S.slevel HAVING S.slevel IN (SELECT S1.slevel FROM STUDENT S1 WHERE S1.slevel < S.slevel)	3 row(s) returned	0.000 sec / 0.000 sec
164 12:56:04	select * from STUDENT LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec
165 12:56:21	select * from FACULTY LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
166 12:56:30	select * from class LIMIT 0, 1000	8 row(s) returned	0.000 sec / 0.000 sec
167 12:56:47	select * from enrolled LIMIT 0, 1000	10 row(s) returned	0.000 sec / 0.000 sec
168 12:57:01	select * from enrolled LIMIT 0, 1000	10 row(s) returned	0.000 sec / 0.000 sec
169 13:04:31	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';	1 row(s) returned	0.000 sec / 0.000 sec

The bottom status bar indicates 'Query Completed'.

-- Query 2

SELECT DISTINCT cname

FROM class

WHERE room='room128'

OR

cname IN (SELECT e.cname FROM enrolled e GROUP BY e.cname HAVING COUNT(*)>=5);

The screenshot displays the MySQL Workbench interface. The central editor shows the following SQL query:

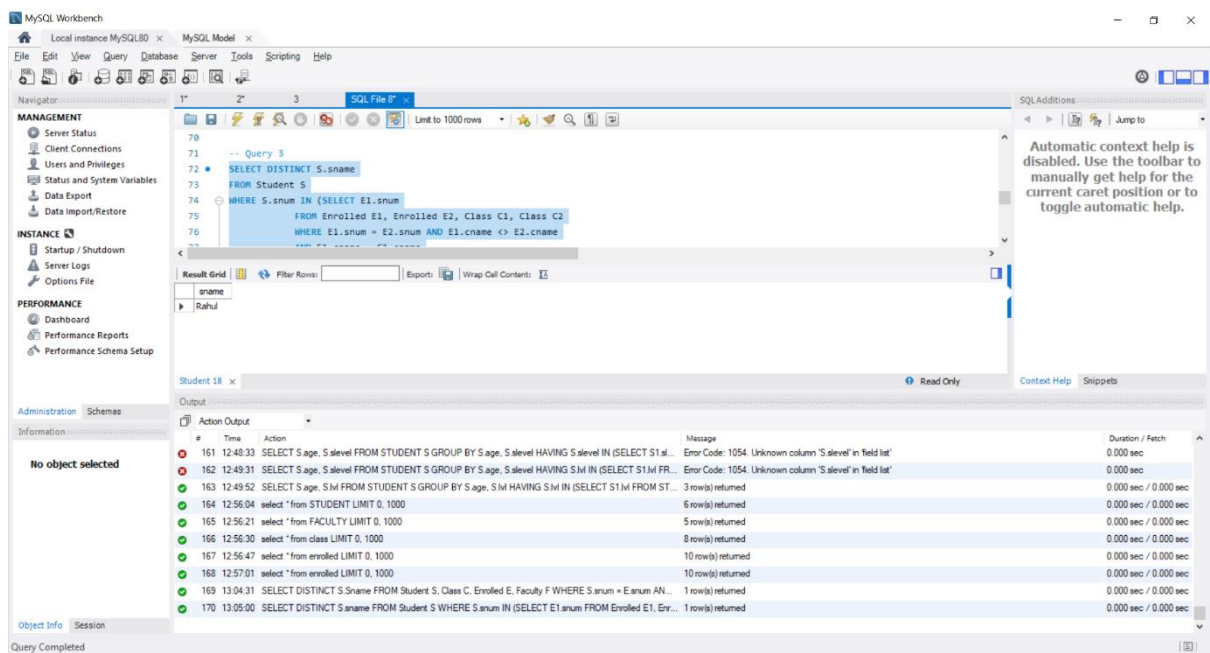
```
-- Query 2
93 SELECT DISTINCT cname
94 FROM class
95 WHERE room='room128'
96 OR
97 cname IN (SELECT e.cname FROM enrolled e GROUP BY e.cname HAVING COUNT(*)>=5);
98
99 -- Query 4
```

The left sidebar contains the 'MANAGEMENT' and 'INSTANCE' sections. The 'Output' tab at the bottom shows the execution results of the query:

Action	Time	Message	Duration / Fetch
166	12:56:30	select * from class LIMIT 0, 1000	8 row(s) returned / 0.000 sec / 0.000 sec
167	12:56:47	select * from enrolled LIMIT 0, 1000	10 row(s) returned / 0.000 sec / 0.000 sec
168	12:57:01	select * from enrolled LIMIT 0, 1000	10 row(s) returned / 0.000 sec / 0.000 sec
169	13:04:31	SELECT DISTINCT S.sname FROM Student S, Class C, Enrolled E, Faculty F WHERE S.snum = E.snum AND...	1 row(s) returned / 0.000 sec / 0.000 sec
170	13:05:00	SELECT DISTINCT S.sname FROM Student S WHERE S.snum IN (SELECT E1.snum FROM Enrolled E1, Enr...	1 row(s) returned / 0.000 sec / 0.000 sec
171	13:05:14	SELECT f.fname, f.fid FROM faculty f WHERE f.fid IN (SELECT f.fid FROM class GROUP BY f.fid HAVING C...	1 row(s) returned / 0.000 sec / 0.000 sec
172	13:05:25	SELECT DISTINCT F.fname FROM Faculty F WHERE 5 > (SELECT COUNT(E.snum) FROM Class C, Enroll...	4 row(s) returned / 0.000 sec / 0.000 sec
173	13:05:37	SELECT DISTINCT S.sname FROM Student S WHERE S.snum NOT IN (SELECT E.snum FROM Enrolled E)...	1 row(s) returned / 0.016 sec / 0.000 sec
174	13:05:51	SELECT S.age, S.m FROM STUDENT S GROUP BY S.age, S.m HAVING S.m IN (SELECT S1.m FROM ST...	3 row(s) returned / 0.000 sec / 0.000 sec
175	13:06:26	SELECT DISTINCT cname FROM class WHERE room='room128' OR cname IN (SELECT e.cname FROM enr...	1 row(s) returned / 0.000 sec / 0.000 sec

The bottom status bar indicates 'Query Completed'.

AND E2.cname = C2.cname AND C1.metts_at = C2.metts_at);



-- Query 4

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));

The screenshot displays the MySQL Workbench interface. The main editor window shows a SQL query with line numbers 97 to 103. The query is as follows:

```
97 OR
98 cname IN (SELECT e.cname FROM enrolled e GROUP BY e.cname HAVING COUNT(*)>=5);
99 -- Query 4
100 SELECT f.fname,f.fid
101 FROM faculty f
102 WHERE f.fid in ( SELECT fid FROM class
103 GROUP BY fid HAVING COUNT(*)=(SELECT COUNT(DISTINCT room) FROM class) );
```

Below the query editor, the 'Result Grid' shows a table with two columns: 'fname' and 'fid'. The first row contains the values 'Shiva' and '14'. The table has 14 rows in total.

The 'Output' pane at the bottom shows a log of SQL actions and their execution times. The first action is a SELECT statement that resulted in an error: 'Error Code: 1054. Unknown column 'S.slevel' in field list'.

The 'SQL Additions' pane on the right contains a message: 'Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.'

-- Query 5

```
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);
```

The screenshot displays the MySQL Workbench interface. The central editor shows the following SQL query:

```
-- Query 5  
81 SELECT DISTINCT F.fname  
82 FROM Faculty F  
83 WHERE 5 > (SELECT COUNT(E.snum)  
84 FROM Class C, Enrolled E  
85 WHERE C.cname = E.cname  
86 AND C.fid = F.fid);
```

Below the query editor, the 'Result Grid' shows the results of the query:

fname
Harish
Mira
Shiva

The 'Output' pane at the bottom shows the execution log with the following entries:

#	Time	Action	Message	Duration / Fetch
163	12:49:52	SELECT S.age, S.M FROM STUDENT S GROUP BY S.age, S.M HAVING S.M IN (SELECT S1.M FROM ST...	3 row(s) returned	0.000 sec / 0.000 sec
164	12:56:04	select * from STUDENT LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec
165	12:56:21	select * from FACULTY LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
166	12:56:30	select * from class LIMIT 0, 1000	8 row(s) returned	0.000 sec / 0.000 sec
167	12:56:47	select * from enrolled LIMIT 0, 1000	10 row(s) returned	0.000 sec / 0.000 sec
168	12:57:01	select * from enrolled LIMIT 0, 1000	10 row(s) returned	0.000 sec / 0.000 sec
169	13:04:31	SELECT DISTINCT S.sname FROM Student S, Class C, Enrolled E, Faculty F WHERE S.snum = E.snum AN...	1 row(s) returned	0.000 sec / 0.000 sec
170	13:05:00	SELECT DISTINCT S.sname FROM Student S WHERE S.snum IN (SELECT E1.snum FROM Enrolled E1, Enr...	1 row(s) returned	0.000 sec / 0.000 sec
171	13:05:14	SELECT f.fname f.fid FROM faculty f WHERE f.fid in (SELECT fd.fid FROM class GROUP BY fd HAVING C...	1 row(s) returned	0.000 sec / 0.000 sec
172	13:05:25	SELECT DISTINCT F.fname FROM Faculty F WHERE 5 > (SELECT COUNT(E.snum) FROM Class C, Enrolled...	4 row(s) returned	0.000 sec / 0.000 sec

The 'Object Info' pane on the left shows 'No object selected'. The 'SQL Additions' pane on the right contains a message: 'Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.'

-- Query 6

SELECT DISTINCT S.sname

FROM Student S

WHERE S.snum NOT IN (SELECT E.snum

FROM Enrolled E);

The screenshot displays the MySQL Workbench interface. The SQL editor at the top contains the following query:

```
86 AND C.fid = F.fid);
87
88 -- Query 6
89 SELECT DISTINCT S.sname
90 FROM Student S
91 WHERE S.snum NOT IN (SELECT E.snum
92 FROM Enrolled E );
```

The query is executed, and the results are shown in the 'Result Grid' pane. The results are as follows:

sname
Rita

The 'Output' pane at the bottom shows the execution log, including the following entries:

#	Time	Action	Message	Duration / Fetch
164	12:56:04	select * from STUDENT LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec
165	12:56:21	select * from FACULTY LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
166	12:56:30	select * from class LIMIT 0, 1000	8 row(s) returned	0.000 sec / 0.000 sec
167	12:56:47	select * from enrolled LIMIT 0, 1000	10 row(s) returned	0.000 sec / 0.000 sec
168	12:57:01	select * from enrolled LIMIT 0, 1000	10 row(s) returned	0.000 sec / 0.000 sec
169	13:04:31	SELECT DISTINCT S.sname FROM Student S, Class C, Enrolled E, Faculty F WHERE S.snum = E.snum AND...	1 row(s) returned	0.000 sec / 0.000 sec
170	13:05:00	SELECT DISTINCT S.sname FROM Student S WHERE S.snum IN (SELECT E1.snum FROM Enrolled E1, Enr...	1 row(s) returned	0.000 sec / 0.000 sec
171	13:05:14	SELECT f.fname f.fid FROM faculty f WHERE f.fid in (SELECT fd.fid FROM class GROUP BY fd HAVING C...	1 row(s) returned	0.000 sec / 0.000 sec
172	13:05:25	SELECT DISTINCT F.fname FROM Faculty F WHERE S > (SELECT COUNT(E.snum) FROM Class C, Enrolled...	4 row(s) returned	0.000 sec / 0.000 sec
173	13:05:37	SELECT DISTINCT S.sname FROM Student S WHERE S.snum NOT IN (SELECT E.snum FROM Enrolled E)...	1 row(s) returned	0.016 sec / 0.000 sec

The query is completed successfully, and the result 'Rita' is displayed in the 'Result Grid' pane.

-- Query 7

```
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;
```

The screenshot displays the MySQL Workbench interface. The central editor shows the SQL query for Query 7, which is a complex nested query involving multiple subqueries and joins. The query is as follows:

```
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;
```

The left sidebar shows the 'MANAGEMENT' and 'INSTANCE' tabs. The 'MANAGEMENT' tab is active, showing a tree view of the database structure. The 'INSTANCE' tab is also visible, showing the server status and logs. The bottom panel shows the 'Output' tab, which displays the execution results of the query. The results are shown in a table with columns for 'id', 'Time', 'Action', 'Message', and 'Duration / Fetch'. The table contains 14 rows of data, including the execution of the query and the results of the subqueries.

#	Time	Action	Message	Duration / Fetch
165	12:56:21	select * from FACULTY LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
166	12:56:30	select * from class LIMIT 0, 1000	8 row(s) returned	0.000 sec / 0.000 sec
167	12:56:47	select * from enrolled LIMIT 0, 1000	10 row(s) returned	0.000 sec / 0.000 sec
168	12:57:01	select * from enrolled LIMIT 0, 1000	10 row(s) returned	0.000 sec / 0.000 sec
169	13:04:31	SELECT DISTINCT S.Sname FROM Student S, Class C, Enrolled E, Faculty F WHERE S.anum = E.anum AND...	1 row(s) returned	0.000 sec / 0.000 sec
170	13:05:00	SELECT DISTINCT S.Sname FROM Student S WHERE S.anum IN (SELECT E1.anum FROM Enrolled E1, Enr...	1 row(s) returned	0.000 sec / 0.000 sec
171	13:05:14	SELECT f.fname,f.fid FROM faculty f WHERE f.fid in (SELECT f.fid FROM class GROUP BY f.fid HAVING C...	1 row(s) returned	0.000 sec / 0.000 sec
172	13:05:25	SELECT DISTINCT F.fname FROM Faculty F WHERE 5 > (SELECT COUNT(E.anum) FROM Class C, Enrolled...	4 row(s) returned	0.000 sec / 0.000 sec
173	13:05:37	SELECT DISTINCT S.Sname FROM Student S WHERE S.anum NOT IN (SELECT E.anum FROM Enrolled E)...	1 row(s) returned	0.016 sec / 0.000 sec
174	13:05:51	SELECT S.age, S.lvl FROM STUDENT S GROUP BY S.age, S.lvl HAVING S.lvl IN (SELECT S1.lvl FROM ST...	3 row(s) returned	0.000 sec / 0.000 sec