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Problem 1

1.

```
SELECT S.sname  FROM cs4707.student S, cs4707.Class C, cs4707.Enrolled E, cs4707.Faculty F
WHERE S.snum = E.snum AND E.cname = C.name AND
C.fid = F.fid AND F.fname = 'Ivana Teach' AND S.level = 'JR';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

sname
Christopher Garcia
Paul Hall

2.

```
SELECT  MAX(S.age) AS max_age FROM cs4707.Student S, cs4707.Class C, cs4707.Enrolled E, cs4707.Faculty F
WHERE
S.snum = E.snum AND E.cname = C.name AND C.fid = F.fid AND F.fname = 'Ivana Teach'
OR
S.major = 'History';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

max_age
20

3.

```
SELECT DISTINCT C.name FROM cs4707.Class C
WHERE C.room = 'R128'
OR C.name IN (
SELECT E.cname
FROM cs4707.Enrolled E
GROUP BY E.cname
HAVING COUNT(*)>=5);
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

name
Archaeology of the Incas
Dairy Herd Management
Data Structures
Database Systems
Intoduction to Math
Operating System Design
Patent Law

4.

```
mysql> SELECT DISTINCT S.sname FROM cs4707.Student S, cs4707.Enrolled E, cs4707.Class C
    -> WHERE
    -> S.snum
    -> IN
    -> (SELECT E1.snum FROM cs4707.Enrolled E1, cs4707.Enrolled E2, cs4707.Class C1, cs4707.Class C2
    -> WHERE E1.snum = E2.snum AND E1.cname = E2.cname AND E1.cname = C1.name
    -> AND E2.cname = C2.name AND C1.meets_at = C2.meets_at);
+--------------------+
| sname              |
+--------------------+
| Kenneth Hill       |
| Juan Rodriguez     |
| Ana Lopez          |
| Karen Scott        |
| Joseph Thompson    |
| Christopher Garcia |
| Paul Hall          |
| Lisa Walker        |
| Luis Hernandez     |
| Susan Martin       |
| Betty Adams        |
+--------------------+
11 rows in set (0.00 sec)
```

5.

	fname
▶	Richard Jackson

6.

```
mysql> SELECT DISTINCT F.fname
    -> FROM cs4707.Faculty F WHERE 5 > (
    -> SELECT COUNT(E.snum)
    -> FROM cs4707.Class C, cs4707.Enrolled E
    -> WHERE C.name = E.cname AND C.fid = F.fid
    -> );
+------------------+
| fname            |
+------------------+
| John Williams    |
| Elizabeth Taylor |
| Mary Johnson     |
| William Moore    |
| James Smith      |
| Barbara Wilson   |
| Patricia Jones   |
| Michael Miller   |
| Robert Brown     |
| David Anderson   |
| Richard Jackson  |
| Ulysses Teach    |
| Jennifer Thomas  |
+------------------+
13 rows in set (0.00 sec)
```

7.

```
mysql> SELECT S.level, AVG(S.age)
    -> FROM cs4707.Student S
    -> GROUP BY S.level;
+-------+------------+
| level | AVG(S.age) |
+-------+------------+
| SR    |    20.7143 |
| JR    |    19.5000 |
| SO    |    18.4000 |
| FR    |    17.6667 |
+-------+------------+
4 rows in set (0.00 sec)
```

8.

```
mysql> SELECT S.level, AVG(S.age)
    -> FROM cs4707.Student S
    -> WHERE S.level NOT LIKE 'JR'
    -> GROUP BY S.level;
+-------+------------+
| level | AVG(S.age) |
+-------+------------+
| SR    |    20.7143 |
| SO    |    18.4000 |
| FR    |    17.6667 |
+-------+------------+
3 rows in set (0.00 sec)
```

9.

```
mysql> SELECT test_table.fname, test_table.CourseCount
    -> FROM(
    -> SELECT F.fname, sum(not(C.room LIKE '%R128%')) = 0 AS no_rooms_wrong, COUNT(*) AS CourseCount
    -> FROM cs4707.Faculty F, cs4707.Class C
    -> WHERE F.fid = C.fid
    -> GROUP BY F.fname
    -> )test_table
    -> WHERE test_table.no_rooms_wrong = 1;
+--------------+-------------+
| fname        | CourseCount |
+--------------+-------------+
| Robert Brown |           1 |
+--------------+-------------+
1 row in set (0.00 sec)

mysql>
```

10.

	sname
▶	Ana Lopez
	Juan Rodriguez

11.

sname
Maria White
Charles Harris
Angela Martinez
Thomas Robinson
Margaret Clark
Dorthy Lewis
Daniel Lee
Nancy Allen
Mark Young
Donald King
George Wright
Steven Green
Edward Baker

12

level	age
FR	17
SO	18
SO	19
JR	20
SR	21
SR	22

Problem 2.

```
156 •   SELECT DISTINCT E.snum
157     FROM cs4707.Enrolled E
158     WHERE E.snum  NOT IN (
159        SELECT derived.snum
160        FROM(
161        SELECT DISTINCT E.snum
162        FROM cs4707.Enrolled E, cs4707.Grade G
163        WHERE E.snum = G.snum
164        )derived );
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

snum
556784565

Problem 3.

```
172 •  SELECT grade_data.cname, grade_data.sname, MAX(grade_data.score) AS high_score
173    FROM(
174        -- Get the students for each class with their scores
175        SELECT * FROM cs4707.Grade G
176        NATURAL JOIN cs4707.Student S
177        ORDER BY score, S.age
178    )grade_data GROUP BY cname;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

cname	sname	high_score
Database Systems	Joseph Thompson	100
Operating System Design	Luis Hernandez	100
Data Structures	Karen Scott	100
Communication Networks	Ana Lopez	87
Optical Electronics	Luis Hernandez	87
Perception	Juan Rodriguez	87
Social Cognition	Juan Rodriguez	87
Patent Law	Susan Martin	65
Urban Economics	Betty Adams	45

Social Cognition

Problem 4.

```
186 •  SELECT * FROM(
187        SELECT *, RANK() OVER (ORDER BY G.score DESC) AS ranking FROM cs4707.Grade G
188        NATURAL JOIN cs4707.Student S
189        WHERE G.cname = 'Operating System Design'
190        ORDER BY  G.score DESC ,S.sname ASC, G.cname , S.age
191    )ranker
192    WHERE ranker.ranking =2
193    ORDER BY ranker.snum LIMIT 0,1;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

snum	cname	score	sname	major	level	age	ranking
115987938	Operating System Design	98	Christopher Garcia	Computer Science	JR	20	2

Problem 5.

```
mysql> SELECT  COUNT(*) AS C
    -> FROM cs4707.Student S
    -> GROUP BY S.sname
    -> HAVING C > 1;
Empty set (0.00 sec)
```

Problem 6.

```
206 •    SELECT sname, RANK() OVER (ORDER BY G.score DESC) AS ranking FROM cs4707.Grade G
207      NATURAL JOIN cs4707.Student S
208      WHERE G.cname = 'Operating System Design'
209     ORDER BY G.score DESC;
210
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

sname	ranking
Luis Hernandez	1
Ana Lopez	2
Karen Scott	2
Christopher Garcia	2
Lisa Walker	5
Joseph Thompson	6

Problem 7.

```
mysql> SELECT DISTINCT  C.name
    -> FROM cs4707.Class C
    -> WHERE C.name NOT IN (
    -> SELECT DISTINCT P.cname
    -> FROM cs4707.Prerequisite P
    -> );
+---------------------------------+
| name                            |
+---------------------------------+
| Air Quality Engineering         |
| American Political Parties      |
| Archaeology of the Incas        |
| Aviation Accident Investigation |
| Data Structures                 |
| Intoduction to Math             |
| Introductory Latin              |
| Marketing Research              |
| Operating System Design         |
| Optical Electronics             |
| Orbital Mechanics               |
| Organic Chemistry               |
| Patent Law                      |
| Perception                      |
| Seminar in American Art         |
| Social Cognition                |
| Urban Economics                 |
+---------------------------------+
17 rows in set (0.00 sec)
```

Problem 8.

```
mysql> SELECT * FROM cs4707.Prerequisite P WHERE P.cname = 'Operating System Design'
    -> UNION
    -> SELECT * FROM cs4707.Prerequisite P WHERE P.cname = 'Multivariate Analysis';
```

```
+-------------------------+----------------------+
| cname                   | prereqcname          |
+-------------------------+----------------------+
| Operating System Design | Database Systems     |
| Database Systems        | Data Structures      |
| Database Systems        | Intoduction to Math  |
| Multivariate Analysis   | Introduction to Math |
+-------------------------+----------------------+
4 rows in set (0.00 sec)
```

Problem 9.

```
230 •  select inside.cname
231    from(
232    select *, count(cname) AS pre_count from cs4707.prerequisite group by cname
233    ) inside
234    WHERE inside.pre_count > 1
235    ;
236
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

cname
Database Systems
Communication Networks

Problem 10.

age	major	sname	name	fid	deptid	score	avg_score	minimum
18	Computer Engineering	Karen Scott	American Political Parties	619023588	11	98	99.0000	18
18	Computer Engineering	Karen Scott	Archaeology of the Incas	248965255	12	98	99.0000	18
18	Computer Engineering	Karen Scott	Communication Networks	141582651	20	98	99.0000	18
18	Computer Engineering	Karen Scott	Intoduction to Math	489221823	33	98	99.0000	18
18	Computer Engineering	Karen Scott	Air Quality Engineering	11564812	68	98	99.0000	18
17	Electrical Engineering	Luis Hernandez	Air Quality Engineering	11564812	68	87	93.5000	17
20	Psychology	Juan Rodriguez	Air Quality Engineering	11564812	68	87	87.0000	20

Problem 11.

```
Query OK, 4 rows affected (0.13 sec)
Rows matched: 4  Changed: 4  Warnings: 0
```

After

```
mysql> select * from grade where cname = 'Database Systems';
+-----------+-----------------+-------+
| snum      | cname           | score |
+-----------+-----------------+-------+
| 112348546 | Database Systems |    85 |
| 115987938 | Database Systems |    95 |
| 322654189 | Database Systems |    97 |
| 348121549 | Database Systems |   100 |
+-----------+-----------------+-------+
4 rows in set (0.00 sec)
```