

Question 1

```
mysql> create table parts(pid int primary key,
    -> pname varchar(20),
    -> color varchar(20));
Query OK, 0 rows affected (0.01 sec)

mysql> create table catalog(
    -> sid int,
    -> pid int,
    -> foreign key(sid) references suppliers(sid),
    -> foreign key(pid) references parts(pid));
Query OK, 0 rows affected (0.01 sec)

mysql> describe catalog;
+-----+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| sid   | int(11)| YES  | MUL | NULL    |       |
| pid   | int(11)| YES  | MUL | NULL    |       |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> alter table catalog add column cost real;
Query OK, 0 rows affected (0.04 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> select * from suppliers s join catalog c on c.sid=s.sid join parts p on p.pid=c.pid;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| sid | sname      | address      | sid | pid | cost | pid | pname      | color |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1   | Steve Smith | Baker Street | 1   | 101 | 150   | 101 | Motor      | Green |
| 1   | Steve Smith | Baker Street | 1   | 102 | 175   | 102 | Fan        | Red   |
| 1   | Steve Smith | Baker Street | 1   | 104 | 210   | 104 | Resistor   | Green |
| 2   | Marnus Labuschagne | 221 Packer Street | 2   | 102 | 180   | 102 | Fan        | Red   |
| 2   | Marnus Labuschagne | 221 Packer Street | 2   | 103 | 205   | 103 | Capacitor  | Red   |
| 3   | Yosemite Sham | Chef Street  | 3   | 101 | 170   | 101 | Motor      | Green |
| 3   | Yosemite Sham | Chef Street  | 3   | 104 | 215   | 104 | Resistor   | Green |
| 4   | Marcus Stoinis | Victoria Street | 4   | 105 | 110   | 105 | Generator  | Red   |
| 4   | Marcus Stoinis | Victoria Street | 4   | 103 | 195   | 103 | Capacitor  | Red   |
| 4   | Marcus Stoinis | Victoria Street | 4   | 101 | 160   | 101 | Motor      | Green |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
10 rows in set (0.00 sec)
```

```
mysql> insert into suppliers values(
    -> 1,'Steve Smith','Baker Street'),
    -> (2,'Marnus Labuschagne','221 Packer Street'),
    -> (3,'Yosemite Sham','Chef Street'),
    -> (4,'Marcus Stoinis','Victoria Street');
Query OK, 4 rows affected (0.00 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql> insert into parts values
    -> (101,'Motor','Green'),
    -> (102,'Fan','Red'),
    -> (103,'Capacitor','Red'),
    -> (104,'Resistor','Green'),
    -> (105,'Generator','Red');
Query OK, 5 rows affected (0.00 sec)
Records: 5 Duplicates: 0 Warnings: 0
```

1. Find the names of suppliers who supply some red part.

```
mysql> select distinct sname from suppliers s join catalog c on s.sid=c.sid join parts p on p.pid=c.pid where p.color='red';
```

sname
Steve Smith
Marnus Labuschagne
Marcus Stoinis

2. Find the sids of suppliers who supply some red or green part.

```
mysql> select distinct sid from catalog c join parts p on c.pid=p.pid where p.color in ('red','green');
```

sid
1
3
4
2

4 rows in set (0.00 sec)

3. Find the sids of suppliers who supply some red part or are at 221 Packer Street.

```
mysql> select distinct c.sid from catalog c join parts p on c.pid=p.pid join suppliers s on s.sid=c.sid where p.color='red' or s.address='221 Packer Street';
```

sid
1
2
4

3 rows in set (0.00 sec)

4. Find the sids of suppliers who supply some red part and some green part

```
mysql> select distinct sid from catalog where sid in(select sid from catalog where pid in(select pid from parts where color='red')) and sid in(select sid from catalog where pid in(select pid from parts where color='green'));
```

sid
1
4

2 rows in set (0.00 sec)

5. Find the sids of suppliers who supply every part.

```
mysql> select sid from catalog c group by c.sid having count(distinct c.pid)=(select count(*) from parts);
```

Empty set (0.01 sec)

6. Find the sids of suppliers who supply every red part.

```
mysql> select sid from catalog c join parts p on c.pid=p.pid where p.color = 'red' group by c.sid having count(distinct c.pid)=(select count(*) from parts where color='red');
```

Empty set (0.00 sec)

7. Find the sids of suppliers who supply every red or green part.

```
mysql> select sid from catalog c join parts p on c.pid=p.pid where p.
color in('red','green') group by c.sid having count(distinct c.pid)=(
Select count(*) from parts where color in ('red','green'));
Empty set (0.01 sec)
```

8. Find the sids of suppliers who supply every red part or supply every green part

```
mysql> select sid from catalog join parts on catalog.pid=parts.pid gr
oup by catalog.sid having sum(case when parts.color='red' then 1 else
  0 end)=(select count(*) from parts where color='red') or sum(case wh
en parts.color='green' then 1 else 0 end)=(select count(*) from parts
where color='green');
+-----+
| sid |
+-----+
| 1 |
| 3 |
+-----+
2 rows in set (0.00 sec)
```

9. Find pairs of sids such that the supplier with the first sid charges more for some part than the supplier with the second sid.

```
mysql> select distinct a.sid as Supplier1,b.sid as Supplier2 from catalog a join catalog
b on a.pid=b.pid where a.cost>b.cost;
+-----+-----+
| Supplier1 | Supplier2 |
+-----+-----+
| 3 | 1 |
| 4 | 1 |
| 2 | 1 |
| 2 | 4 |
| 3 | 4 |
+-----+-----+
5 rows in set (0.00 sec)
```

10. Find the pids of parts supplied by at least two different suppliers.

```
mysql> select pid from catalog group by pid having count(distinct sid)>1;
+-----+
| pid |
+-----+
| 101 |
| 102 |
| 103 |
| 104 |
+-----+
4 rows in set (0.00 sec)
```

11. Find the pids of the most expensive parts supplied by suppliers named Yosemite Sham.

```
mysql> select pid from catalog c join suppliers s on s.sid=c.sid where cost=(select max(cost) from catalog) and s.sname='Yosemite Sham';
+-----+
| pid |
+-----+
| 104 |
+-----+
1 row in set (0.01 sec)
```

12. Find the pids of parts supplied by every supplier at less than \$200. (If any supplier either does not supply the part or charges more than \$200 for it, the part is not selected.)

```
mysql> select pid from catalog group by pid having count(distinct sid)=(select count(*) from suppliers) and max(cost)<200;
Empty set (0.00 sec)
```