Matthew Kramer - Homework 2

Suppliers (*sid*: integer, *sname*: string, *address*: string)
Parts(*pid*: integer, *pname*: string, *color*: string)
Catalog(*sid*: integer, *pid*: integer, *cost*: real)

1. Find the *pnames* of parts for which there is some supplier.

```
SELECT P.pname
FROM Parts P
WHERE EXISTS (SELECT *
              FROM Catalog C
              WHERE C.pid = P.pid)
```

2. Find the *snames* of suppliers who supply every part.

```
SELECT S.sname
FROM Suppliers S
WHERE NOT EXISTS (SELECT P.pid
                  FROM Parts P)
                  EXCEPT
                  (SELECT C.pid
                  FROM Catalog C
                  WHERE C.sid = S.sid)
```

3. Find the *snames* of suppliers who supply every red part.

```
SELECT S.sid, S.sname
FROM Suppliers S, Catalog C, Parts P1
WHERE S.sid = C.sid AND C.pid = P.pid AND P.color = 'red'
GROUP BY S.sid, S.sname
HAVING count(*) = (SELECT count(*)
                   FROM Parts P2
                   WHERE P2.color = 'red')
```

4. Find the *pnames* of parts supplied by Acme Widget Suppliers and no one else.

```
SELECT P.pname
FROM Parts P
WHERE P.pid IN (SELECT C1.pid
                FROM Catalog C1, Suppliers S1
                WHERE C1.sid = S1.sid AND S1.sname = 'Acme Widget Suppliers')
                EXCEPT
                (SELECT C2.pid
                FROM Catalog C2, Suppliers S2
                WHERE C2.sid = S2.sid AND S2.sname != 'Acme Widget Suppliers')
```

5. Find the *sids* of suppliers who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part).

```
SELECT C1.sid
FROM Catalog C1, (SELECT C1.pid AS pid, avg(C1.cost) AS avg_cost
                  FROM Catalog C2
                  GROUP BY C2.pid) AS A
WHERE C1.pid = A.pid AND C1.cost > A.avg_cost
```

6. For each part, find the *sname* of the supplier who charges the most for that part.

```
SELECT P.pid, S.sname
FROM Parts P, Suppliers S, Catalog C1
WHERE P.pid = C1.pid AND C1.sid = S.sid AND C1.cost = (SELECT max(C2.cost)
                                                       FROM Catalog C2
                                                       WHERE C2.pid = P.pid)
```

7. Find the *sids* of suppliers who supply only red parts.

```
SELECT C.sid
FROM Catalog C
WHERE NOT EXISTS (SELECT *
                  FROM Parts P
                  WHERE P.pid = C.pid and P.color != 'red')
```

8. Find the *sids* of suppliers who supply a red part and a green part.

```
(SELECT C1.sid
 FROM Catalog C1, Parts P1
 WHERE C1.pid = P1.pid AND P1.color = 'red')
INTERSECT
(SELECT C2.sid
FROM Catalog C2, Parts P2
WHERE C2.pid = P2.pid AND P2.color = 'green')
```

9. Find the *sids* of suppliers who supply a red part or a green part.

```
(SELECT C1.sid
 FROM Catalog C1, Parts P1
 WHERE C1.pid = P1.pid AND P1.color = 'red')
UNION
(SELECT C2.sid
FROM Catalog C2, Parts P2
WHERE C2.pid = P2.pid AND P2.color = 'green')
```

10. For every supplier that only supplies green parts, print the name of the supplier and the total number of parts that she supplies.

```
SELECT S.sname, S.sid, count(C1.pid)
FROM Suppliers S, Catalog C1
WHERE S.sid = C.sid AND S.sid IN (SELECT C2.sid
                                  FROM Catalog C2, Parts P2
                                  WHERE C2.pid = P2.pid AND P2.color = 'green')
                                  EXCEPT
                                  (SELECT C3.sid
                                  FROM Catalog C3, Parts P3
                                  WHERE C3.pid = P3.pid AND P3.color != 'green')
GROUP BY S.sid, S.sname
```

11. For every supplier that supplies a green part and a red part, print the name and price of the most expensive part that she supplies.

```
SELECT S.sname, max(C.cost)
FROM Suppliers S, Catalog C, Parts P
WHERE P.pid = C.pid AND C.sid = S.sid
GROUP BY S.sid, S.sname
HAVING ANY P.color = 'green' AND ANY P.color = 'red'
```