



# SD202: Databases

## SQL exercises

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## Statement

Consider a database schema that consists of the following tables:

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

Write the following queries:

- **1. Find the names of suppliers who supply some red part.**
- **2. Find the sids of suppliers who supply some red or green part.**
- (...)

Source: R. Ramakrishnan, J. Gehrke. Database Management Systems, 3rd ed., 2002.

Exercise 4.3

## Solution to questions 1 and 2

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

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

## Solution to questions 1 and 2

- Supplier(sid, sname, address), indicating supplier details,
- Parts(pid, pname, color), indicating the details of each part, and
- Catalog(sid, pid, cost), listing the prices charged for parts by suppliers.

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

```
SELECT S.sname FROM Suppliers S, Parts P, Catalog C
WHERE P.color='red' AND C.pid=P.pid AND C.sid=S.sid
```

## Solution to questions 1 and 2

- Supplier(sid, sname, address), indicating supplier details,
- Parts(pid, pname, color), indicating the details of each part, and
- Catalog(sid, pid, cost), listing the prices charged for parts by suppliers.

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

```
SELECT S.sname FROM Suppliers S, Parts P, Catalog C
WHERE P.color='red' AND C.pid=P.pid AND C.sid=S.sid
```

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

## Solution to questions 1 and 2

- Supplier(sid, sname, address), indicating supplier details,
- Parts(pid, pname, color), indicating the details of each part, and
- Catalog(sid, pid, cost), listing the prices charged for parts by suppliers.

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

```
SELECT S.sname FROM Suppliers S, Parts P, Catalog C
WHERE P.color='red' AND C.pid=P.pid AND C.sid=S.sid
```

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

```
SELECT C.sid FROM Catalog C, Parts P
WHERE (P.color = 'red' OR P.color = 'green')
AND P.pid = C.pid
```

## Question 3

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

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

## Question 3

- Supplier(sid, sname, address), indicating supplier details,
- Parts(pid, pname, color), indicating the details of each part, and
- Catalog(sid, pid, cost), listing the prices charged for parts by suppliers.

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

```
SELECT S.sid FROM Suppliers S
WHERE S.address = '221 Packer street'
OR S.sid IN
  (SELECT C.sid FROM Parts P, Catalog C
   WHERE P.color='red' AND P.pid = C.pid)
```



## Question 4

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

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

## Question 4

- Supplier(sid, sname, address), indicating supplier details,
- Parts(pid, pname, color), indicating the details of each part, and
- Catalog(sid, pid, cost), listing the prices charged for parts by suppliers.

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

```
SELECT C.sid FROM Parts P, Catalog C
WHERE P.color = 'red' AND P.pid = C.pid
AND EXISTS
  (SELECT P2.pid FROM Parts P2, Catalog C2
   WHERE P2.color = 'green' AND C2.sid = C.sid AND P2.pid = C2.pid)
```

## Question 5

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

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

## Question 5

- Supplier(sid, sname, address), indicating supplier details,
- Parts(pid, pname, color), indicating the details of each part, and
- Catalog(sid, pid, cost), listing the prices charged for parts by suppliers.

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

```
SELECT C.sid FROM Catalog C
WHERE NOT EXISTS
  (SELECT P.pid FROM Parts P
   WHERE NOT EXISTS
     (SELECT C1.sid FROM Catalog C1
      WHERE C1.sid = C.sid AND C1.pid = P.pid))
```

## Question 6

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

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

## Question 6

- Supplier(sid, sname, address), indicating supplier details,
- Parts(pid, pname, color), indicating the details of each part, and
- Catalog(sid, pid, cost), listing the prices charged for parts by suppliers.

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

```
SELECT C.sid FROM Catalog C
WHERE NOT EXISTS
  (SELECT P.pid FROM Parts P
   WHERE P.color = 'red' OR P.color = 'green' AND NOT EXISTS
     (SELECT C1.sid FROM Catalog C1
      WHERE C1.sid = C.sid AND C1.pid = P.pid))
```

## Question 7

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

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

## Question 7

- Supplier(sid, sname, address), indicating supplier details,
- Parts(pid, pname, color), indicating the details of each part, and
- Catalog(sid, pid, cost), listing the prices charged for parts by suppliers.

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

```
SELECT C.sid FROM Catalog C
WHERE (NOT EXISTS (SELECT P.pid FROM Parts P
    WHERE P.color = 'red' AND (NOT EXISTS
        (SELECT C1.sid FROM Catalog C1
            WHERE C1.sid = C.sid AND C1.pid = P.pid))))
OR (NOT EXISTS (SELECT P1.pid FROM Parts P1
    WHERE P1.color = 'green' AND (NOT EXISTS
        (SELECT C2.sid FROM Catalog C2
            WHERE C2.sid = C.sid AND C2.pid = P1.pid))))
```



## Question 8

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

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

## Question 8

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

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

```
SELECT C1.sid, C2.sid FROM Catalog C1, Catalog C2
WHERE C1.pid = C2.pid AND C1.sid <> C2.sid AND C1.cost > C2.cost
```

## Question 9

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

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

## Question 9

- Supplier(sid, sname, address), indicating supplier details,
- Parts(pid, pname, color), indicating the details of each part, and
- Catalog(sid, pid, cost), listing the prices charged for parts by suppliers.

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

```
SELECT C.pid FROM Catalog C
WHERE EXISTS (SELECT C1.sid FROM Catalog C1
              WHERE C1.pid = C.pid AND C1.sid <> C.sid)
```

## Question 10

- `Supplier(sid, sname, address)`, indicating supplier details,
- `Parts(pid, pname, color)`, indicating the details of each part, and
- `Catalog(sid, pid, cost)`, listing the prices charged for parts by suppliers.

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

## Question 10

- Supplier(sid, sname, address), indicating supplier details,
- Parts(pid, pname, color), indicating the details of each part, and
- Catalog(sid, pid, cost), listing the prices charged for parts by suppliers.

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

```
SELECT C.pid FROM Catalog C, Suppliers S
WHERE S.sname = 'Yosemite Sham' AND C.sid = S.sid
      AND C.cost >= ALL (SELECT C2.cost FROM Catalog C2, Suppliers S2
                        WHERE S2.sname = 'Yosemite Sham' AND C2.sid = S2.sid)
```