SQL In Class Exercises

- Use the following database scheme for the problems in this exercise.

- Develop SQL expressions for each of the following queries:
1. List only the names of those suppliers who ship a part that weighs more than 200.

**Solutions**

```sql
SELECT sname
FROM suppliers NATURAL JOIN shipments CROSS JOIN parts
WHERE weight > 200 AND shipments.pnum = parts.pnum;
```

- or -

```sql
SELECT sname
FROM suppliers
WHERE snum IN (SELECT snum
FROM shipments
WHERE pnum IN (SELECT pnum
FROM parts
WHERE weight > 200) ) );
```

Note that a second natural join won't work here since the join would also occur on the city attribute, which would be a more restrictive query.
2. List the names of those cities in which both a supplier and a job are located.

Solutions

SELECT supplier.city
FROM suppliers NATURAL JOIN jobs;

- or -

SELECT supplier.city
FROM suppliers
WHERE city IN (SELECT city
    FROM jobs);
3. List the names of those jobs that receive a shipment from supplier number S1.

Solutions

SELECT jname
FROM jobs
WHERE jnum IN (SELECT jnum
                   FROM shipments
                   WHERE snum = "S1");

- or -

SELECT jname
FROM jobs NATURAL JOIN shipments
WHERE snum = "S1";
4. List the names of those parts that are not shipped to any job.

Solutions

SELECT pname
FROM parts
WHERE pnum NOT IN (SELECT pnum
FROM shipments);

- or -

SELECT pname
FROM parts
WHERE NOT EXISTS (SELECT *
FROM shipments
WHERE shipments.pnum = parts.pnum);
5. List the names of those suppliers who ship part number P2 to any job.

Solutions

SELECT sname
FROM suppliers
WHERE snum IN (SELECT snum
                FROM shipments
                WHERE pnum = "P2");

- or -

SELECT sname
FROM suppliers NATURAL JOIN shipments
WHERE pnum = "P2";
6. List the names of those suppliers who do not ship part number P2 to any job.

Solutions

SELECT sname
FROM suppliers
WHERE snum NOT IN (SELECT snum
FROM shipments
WHERE pnum = “P2”);

- or -

SELECT sname
FROM suppliers
WHERE NOT EXISTS (SELECT *
FROM shipments
WHERE shipments.snum = suppliers.snum AND shipments.pnum = “P2”);
7. List the names of those suppliers who ship part at least one red part to any job.

Solutions

SELECT sname
FROM suppliers
WHERE snum IN (SELECT snum
               FROM shipments
               WHERE pnum IN (SELECT pnum
                               FROM parts
                               WHERE color = "red")
               );

- or -

SELECT sname
FROM suppliers NATURAL JOIN shipments
WHERE pnum IN (SELECT pnum
               FROM parts
               WHERE color = "red" );

Note that neither of the following are correct!

SELECT sname
FROM suppliers
WHERE snum = (SELECT snum
              FROM shipments
              WHERE pnum ≠ "P2")

- or -

SELECT sname
FROM suppliers
WHERE snum IN (SELECT snum
               FROM shipments
               WHERE snum ≠ "P2");
8. List the part number for every part that is shipped by more than one supplier.

Solution

SELECT pnum
FROM shipments
GROUP BY pnum
HAVING COUNT (jnum) > 1;

WHERE clause restricts by rows
HAVING clause restricts by groups
9. List the names of those suppliers who ship every part.

Solutions

SELECT sname
FROM suppliers
WHERE NOT EXISTS (SELECT *
FROM parts
WHERE NOT EXISTS (SELECT *
FROM shipments
WHERE shipments.snum = suppliers.snum
AND shipments.pnum = parts.pnum ) );

- or -

SELECT sname
FROM suppliers
WHERE (SELECT COUNT (shipments.pnum)
FROM shipments
WHERE shipments.snum = suppliers.snum
AND shipments.pnum = parts.pnum ) ;

This solution is correct if the participation of parts in shipments is optional or mandatory.

This solution is correct only if the participation of parts in shipments is mandatory. It is incorrect if the participation of parts in shipments is optional.