Nested queries

Subqueries in SELECT

```sql
SELECT DISTINCT C.cname, (SELECT count(*)
    FROM Product P
    WHERE P.cid=C.cid)
FROM Company C
```

Subqueries in FROM

```sql
SELECT X.pname
FROM (SELECT * FROM Product AS Y WHERE price > 20) as X
WHERE X.price < 500
```

Subqueries in WHERE

```sql
SELECT DISTINCT C.cname
FROM Company C
WHERE EXISTS (SELECT *
    FROM Product P
    WHERE C.cid = P.cid and P.price < 200)
```
subqueries in WHERE

- SELECT ........... WHERE EXISTS (sub);
- SELECT ........... WHERE NOT EXISTS (sub);
- SELECT ........... WHERE attribute IN (sub);
- SELECT ........... WHERE attribute NOT IN (sub);
- SELECT ........... WHERE attribute > ANY (sub);
- SELECT ........... WHERE attribute > ALL (sub);
Likes(drinker, beer)  
Frequents(drinker, bar)  
Servers(bar, beer)  

Find drinkers that frequent some bar that serves only beer they like.

Find drinkers that frequent only bars that serve only beer they like.
Likes(drinker, beer)
Frequents(drinker, bar)
Servers(bar, beer)

Find drinkers that frequent some bar that serves only beer they like.

\[
\text{SELECT F.drinker} \\
\text{FROM Frequents F} \\
\text{WHERE NOT EXISTS (SELECT * FROM Serves S} \\
\text{WHERE S.bar = F.bar AND} \\
\text{NOT EXISTS (SELECT * FROM Likes L} \\
\text{WHERE L.beer = S.beer AND L.drinker = F.drinker))};
\]

Find drinkers that frequent only bars that serve only beer they like.

\[
\text{SELECT F2.drinker} \\
\text{FROM Frequents F2} \\
\text{WHERE NOT EXISTS (SELECT * FROM Serves S, Frequents F} \\
\text{WHERE S.bar = F.bar AND F.drinker = F2.drinker AND} \\
\text{NOT EXISTS (SELECT * FROM Likes L} \\
\text{WHERE L.beer = S.beer AND L.drinker = F.drinker))};
\]
Relational Algebra

- Product (pid, name, price)
- Purchase (pid, cid, store)
- Customer (cid, name, city)

SELECT name
FROM Customer
WHERE city = 'Seattle';
Relational Algebra

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- Purchase (pid, cid, store)
- Customer (cid, name, city)

SELECT name
FROM Customer
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