Nested queries

Subqueries in SELECT

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

Subqueries in FROM

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

Subqueries in WHERE

```
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.

```
SELECT F.drinker
FROM Frequents F
WHERE NOT EXISTS (SELECT * FROM Serves S
                  WHERE S.bar = F.bar AND
                      NOT EXISTS (SELECT * FROM Likes L
                                  WHERE L.beer = S.beer AND L.drinker = F.drinker));
```

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

```
SELECT F2.drinker
FROM Frequents F2
WHERE NOT EXISTS (SELECT * FROM Serves S, Frequents F
                  WHERE S.bar = F.bar AND F.drinker = F2.drinker AND
                      NOT EXISTS (SELECT * FROM Likes L
                                  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’;
```

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