

CSE 344 – Section 3

Today:

- HW3 Setup
- SQL Server Basics
- Using nested query semantics

SQL Server Basics

/ Get list of tables */*

```
SELECT * FROM INFORMATION_SCHEMA.TABLES WHERE  
TABLE_TYPE='BASE TABLE';
```

/ Get the columns of a table */*

```
SELECT * FROM INFORMATION_SCHEMA.COLUMNS  
WHERE TABLE_NAME='tableName';
```

/ Do a SQLite LIMIT */*

```
SELECT TOP 10 *  
FROM ...;
```

Nested queries

Subqueries in SELECT – Must be single valued

```
SELECT R.name, (...subquery like count(*)...)
FROM   SomeRelation R
```

Subqueries in WHERE using =/</> – Single valued

```
SELECT R.name
FROM   SomeRelation R
WHERE  R.<attribute> = (...subquery...>)
```

Subqueries in FROM

```
SELECT *
FROM   SomeRelation R,
(...subquery...) SomeAlias
```

Nested queries 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)

Serves(bar, beer)

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

$$\exists y. \text{Frequents}(x, y) \wedge \forall z. (\text{Serves}(y, z) \Rightarrow \text{Likes}(x, z))$$

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$$\forall y. \text{Frequents}(x, y) \Rightarrow \forall z. (\text{Serves}(y, z) \Rightarrow \text{Likes}(x, z))$$
$$\exists u \text{ Frequents}(x, u) \wedge \text{not } (\exists y \exists z \text{ Frequents}(x, y) \wedge \text{Serves}(y, z) \wedge \text{not Likes}(x, z))$$

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$$\exists y. \text{Frequents}(x, y) \wedge \forall z. (\text{Serves}(y, z) \Rightarrow \text{Likes}(x, z))$$

```
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));
```

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$$\exists u \text{ Frequents}(x, u) \wedge \text{not } (\exists y \exists z \text{ Frequents}(x, y) \wedge \text{Serves}(y, z) \wedge \text{not Likes}(x, z))$$

```
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));
```