

CMPT 321
Fall 2017

Structured Query Language SQL

Lecture 03.03

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SET OPERATIONS

Union, Intersection, and Difference in SQL

- If two SQL queries produce relations with compatible set of attributes then we can combine the queries using the set operations:

(«subquery») UNION («subquery»)

(«subquery») INTERSECT («subquery»)

(«subquery») EXCEPT («subquery»)

- The brackets are mandatory.
- The operands must be queries; you can't simply use a relation name.

Example

```
(SELECT name  
FROM Took  
WHERE grade > 95)  
UNION  
(SELECT name  
FROM Took  
WHERE grade < 50);
```

Bags vs Sets in Union, Intersection and Difference

- We saw that a **SELECT-FROM-WHERE** statement **uses bag semantics** by default: Duplicates are kept in the result.
- The **set operations use set semantics** by default: Duplicates are eliminated from the result.

Motivation?

- When doing projection in relational algebra, it is harder to eliminate duplicates: one tuple at a time
- When doing **intersection** or **difference**, it is most efficient to **sort** the relations first. At that point you may as well eliminate the duplicates anyway.

Controlling Duplicate Elimination

- We can force the result of a SFW query to be a set:

```
SELECT DISTINCT ...
```

- We can force the result of a set operation to be a bag by using **ALL**:

```
(SELECT sid  
FROM Took  
WHERE grade > 95)  
  UNION ALL  
(SELECT sid  
FROM Took  
WHERE grade < 50);
```