CS 1555

Lecture 12

**Structured Query Language (SQL) – DML (continued)**

Set membership

- The IN and NOT IN operators check for simple membership

Set membership and comparisons

- Test for membership on other comparisons (=, <>, >, >=, <, <=)

- Can be quantified using ANY or ALL

- Ex: … WHERE H.Salary < ANY (SELECT L.Salary … ) 🡪 see if head librarian salary is less than any non-head librarian

Set comparisons: unique & empty

- UNIQUE and NOT UNIQUE operators test for duplicates in a result

- EXISTS and NOT EXISTS operators test for emptiness in a result

- UNIQUE in Postgres & Oracle is used for constraints instead of DISTINCT

- Always use DISTINCT

- UNIQUE & NOT UNIQUE can be expressed using JOIN

Removing duplicates

- (1, CS, Math) and (1, Math, CS) when talking about double majors are duplicates in a semantic sense, i.e. not according to relational algebra

- Augment it with an inequality to eliminate one side (C.Major > M.Major will only keep one of the tuples)

Rank function

- SELECT SID, RANK() OVER (ORDER BY score) AS rank FROM ENROLL WHERE S.CID = ‘CS 1555’;

Group rank function

- RANK() OVER (PARTITION BY CID ORDER BY score) AS rank

Limiting result rows

- Save resources, speed up result

- FETCH clause

- OFFSET start {ROW | ROWS}

- FETCH {FIRST | NEXT} [count] {ROW | ROWS} ONLY

- OFFSET must come before FETCH

- SELECT \* FROM STUDENT FETCH FIRST 10 ROWS ONLY

Limits (no standard syntax)

- SELECT \* FROM T LIMIT 10 OFFSET 20

- Works for MySQL, PostgreSQL (not default but still supported), and SQLite

Update tuples

- Update can apply to a single relation

- Update all the selected tuples by the condition in the WHERE clause

Delete tuple

- Removes all tuples by condition in WHERE clause

INSERT

- Two forms: implicit (list) vs explicit (set)

Derived insert values

- Tuples are derived using select

- Useful to populate a table in the database from data already in the database