Nested Subquery

* A SELECT-FROM-WHERE expression that is nested within another query

Set Membership (Testing attribute in the subquery)

* Course offered in Fall 2017 and in Spring 2018
* SELECT DISTINCT course\_id
* FROM section
* WHERE semester = ‘Fall’ and year = 0217 and course \_id in
  + (SELECT course\_id
  + FROM section
  + WHERE semester = ‘Spring’ and year = 2018);
* Course offered in Fall 2017 and not in Spring 2018
* SELECT DISTINCT course\_id
* FROM section
* WHERE semester = ‘Fall’ and year = 0217 and course \_id not in
  + (SELECT course\_id
  + FROM section
  + WHERE semester = ‘Spring’ and year = 2018);
* Name all instructors whose name is neither “Mozart” nor “Einstein”
* SELECT DISTINCT name
* FROM instructor
* WHERE name not in (‘Mozart’, ‘Einstein’);

Set Comparison (Returns true or false; Tests if the subquery returns a row or not)

* Exists
* Not exists
* Show course that students did not take
* SELECT DISTINCT S.ID, S.name
* FROM student as S
* WHERE not exists
  + ((SELECT course\_id
  + FROM course
  + WHERE dept\_name = ‘Biology’)
  + Except
    - (SELECT T.course\_id
    - FROM takes as T
    - WHERE S.ID = T.ID))

Subqueries in the FROM clause

Scalar Subquery

* SELECT dept\_name,
* (SELECT count(\*)
* FROM instructor
* WHERE department.dept\_name = instructor.dept\_name)
* As num\_instructors
* FROM department;

Modifications

* Deletion
  + Delete all instructors
  + DELETE from instructor
  + Delete all instructors from the Finance department
  + DELETE from instructor
  + WHERE dept\_name = ‘Finance’;
* Insertion
  + Add a new tuple to course
  + INSERT into course
  + VALUES (‘CS-437’,’Database Systems’,’Comp. Sci’,4);
* Updates
  + Give 5% salary raise to all instructors
  + UPDATE instructor
  + SET salary = salary \* 1.05