

Set comparison operators

These include EXISTS, ANY, ALL, IN, <, >, =, <=, =>, <>. We covered EXISTS and IN in the previous examples (for those on-line students, you should examine those first). Let's talk about ANY.

ANY means "return TRUE if the comparison is TRUE for ANY of the values in the column the subquery returns".

Check out below:

```
mysql> SELECT * from Students;
+-----+-----+-----+
| SID | SName          | NumCredits |
+-----+-----+-----+
|  1 | Elmer Fudd     |         48 |
|  2 | Roger Ramjet   |         20 |
|  3 | Alice Wonderland |         72 |
+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> SELECT * FROM Enrolled;
+-----+-----+-----+
| SID | ClassID | Grade |
+-----+-----+-----+
|  1 | CS314   | NULL  |
|  1 | CS575   | NULL  |
|  2 | CS430   | NULL  |
|  2 | CS575   | NULL  |
|  3 | CT320   | NULL  |
+-----+-----+-----+
5 rows in set (0.00 sec)

mysql> SELECT S.SName
-> FROM Students S
-> WHERE S.NumCredits > ANY
-> (SELECT S2.NumCredits FROM Students S2, Enrolled E
-> WHERE S2.SID = E.SID AND E.ClassID = "CS314");

+-----+
| SName          |
+-----+
| Alice Wonderland |
+-----+
1 row in set (0.00 sec)
```

Translated to English, this query says "Give me the name of any students whose number of credits is greater than any student taking CS314."

How about the ALL operator? ALL means "return TRUE if the comparison is TRUE for ALL of the values in the column that the subquery returns". In the below example, we are adding the table Class to the mix.

```
mysql> SELECT * FROM Class;
+-----+-----+
| ClassID | TimeOffered |
+-----+-----+
| CS314   | 11-12:15    |
| CS430   | 12:30-1:45  |
| CS575   | NULL        |
| CT320   | 11-12:15    |
+-----+-----+
4 rows in set (0.00 sec)
```

```
mysql> SELECT S.SName
-> FROM Students S, Enrolled E
-> WHERE S.SID = E.SID AND E.ClassID <> ALL
-> (SELECT E2.ClassID FROM Enrolled E2, Class C
-> WHERE E.ClassID = C.ClassID AND C.TimeOffered = "11-12:15");
+-----+
| SName      |
+-----+
| Elmer Fudd  |
| Roger Ramjet |
| Roger Ramjet |
+-----+
3 rows in set (0.00 sec)
```

This query says "Give me the names of the students who are taking classes that are not offered at 11-12:15. Those classes are CS430 and CS575 - looking at Enrolled we see Student 1 has one and Student 2 has 2 - which match the output of the query. We can of course add a DISTINCT to the SELECT to eliminate Roger's name twice:

```
mysql> SELECT DISTINCT S.SName
-> FROM Students S, Enrolled E
-> WHERE S.SID = E.SID AND E.ClassID <> ALL
-> (SELECT E2.ClassID FROM Enrolled E2, Class C
-> WHERE E.ClassID = C.ClassID AND C.TimeOffered = "11-12:15");
+-----+
| SName      |
+-----+
| Elmer Fudd  |
| Roger Ramjet |
+-----+
2 rows in set (0.00 sec)
```