

# Session 6-10 Subqueries 2

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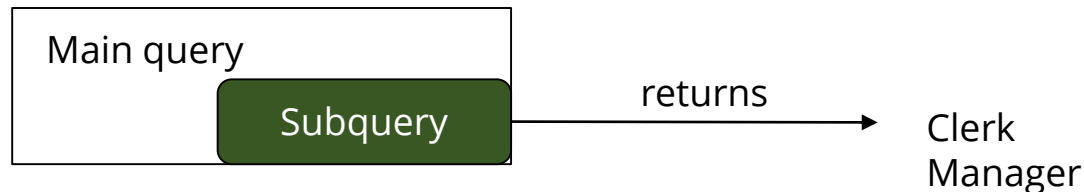


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# Multiple-Row Subqueries

- Return more than one row of results
  - i.e., a list of values
- Require use of IN, ANY, ALL operators (the operators handling lists, not single values)



# IN Operator

- WHERE X IN (2, 6, 8, 10, 12)
  - X=1; False
  - X=6; True (will be returned)
  - To be returned, X should be listed in the parentheses



# ANY and ALL Operators Example

- WHERE  $X > \text{ANY}(2, 6, 8, 10, 12)$ 
  - $X=1$ ; False
  - $X=5$ ; True (will be returned)
  - To be returned,  $X$  should be greater than 2
- WHERE  $X > \text{ALL}(2, 6, 8, 10, 12)$ 
  - $X=1$ ; False
  - $X=5$ ; False
  - $X=13$ ; True (will be returned)
  - To be returned,  $X$  should be greater than 12



# ANY and ALL Operators

- Combine with arithmetic operators

| OPERATOR | DESCRIPTION  |
|----------|--|
| >ALL     | More than the highest value returned by the subquery     |
| <ALL     | Less than the lowest value returned by the subquery      |
| <ANY     | Less than the highest value returned by the subquery     |
| >ANY     | More than the lowest value returned by the subquery      |
| =ANY     | Equal to any value returned by the subquery (same as IN) |

**FIGURE 12-11** Descriptions of ALL and ANY operator combinations

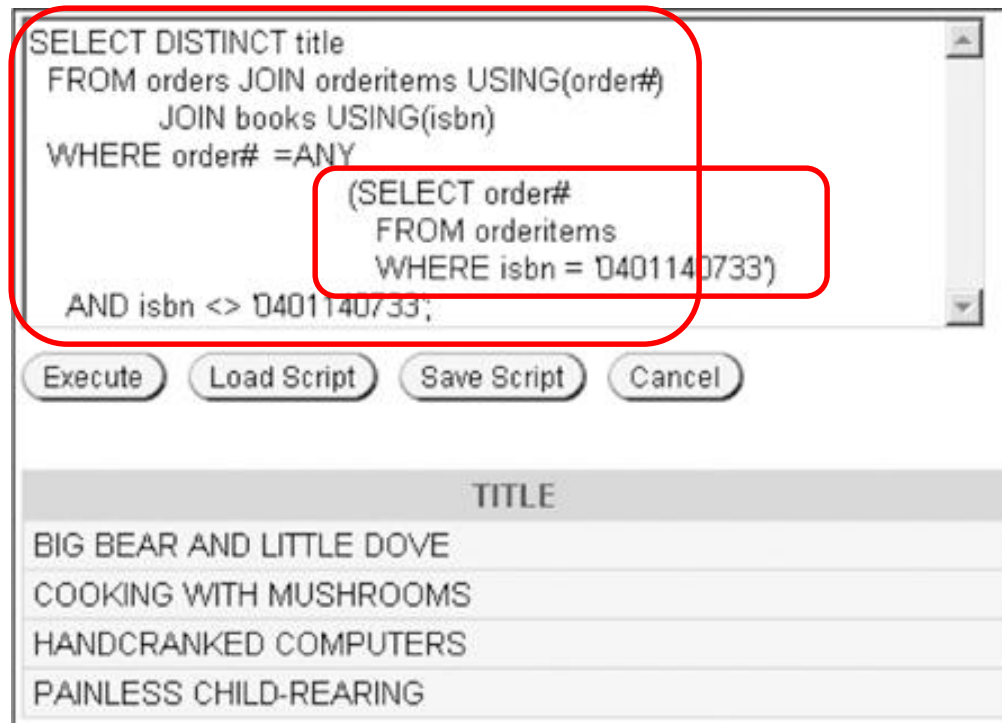


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# Frequently-bought-together Suggestion

*Q) List the title of all books that were purchased together with the book with ISBN of '0401140733'*



```
SELECT DISTINCT title
FROM orders JOIN orderitems USING(order#)
      JOIN books USING(isbn)
WHERE order# = ANY
      (SELECT order#
       FROM orderitems
       WHERE isbn = '0401140733')
AND isbn <> '0401140733';
```

Execute Load Script Save Script Cancel

| TITLE                    |
|--------------------------|
| BIG BEAR AND LITTLE DOVE |
| COOKING WITH MUSHROOMS   |
| HANDCRANKED COMPUTERS    |
| PAINLESS CHILD-REARING   |

Get all book titles  
that were included  
in that order  
numbers

Get all order# that  
includes this ISBN



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# Multiple-Row Subquery in WHERE Clause



The screenshot shows a database query window with a text area containing the following SQL query:

```
SELECT title, retail
FROM books
WHERE retail <ANY
      (SELECT retail
       FROM books
       WHERE category = 'COOKING');
```

Below the text area are four buttons: Execute, Load Script, Save Script, and Cancel.

Below the buttons is a table with two columns: TITLE and RETAIL. The table contains the following data:

| TITLE                    | RETAIL |
|--------------------------|--------|
| BIG BEAR AND LITTLE DOVE | 8.95   |
| COOKING WITH MUSHROOMS   | 19.95  |
| REVENGE OF MICKEY        | 22     |
| HANDCRANKED COMPUTERS    | 25     |

**FIGURE 12-15** The <ANY operator



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# Multiple-Row Subquery in HAVING Clause

*Q) List the order # and revenue of all orders with revenue higher than any values of the average revenues by state*

```
SELECT order#, SUM(retail*quantity)
FROM orders JOIN orderitems USING(order#)
      JOIN books USING(isbn)
HAVING SUM(retail*quantity) >ANY
      (SELECT AVG(SUM(quantity*retail))
       FROM orders JOIN orderitems USING(order#)
       JOIN books USING(isbn)
       GROUP BY shipstate)
GROUP BY order#;
```

Execute Load Script Save Script Cancel

| ORDER# | SUM(RETAIL*QUANTITY) |
|--------|----------------------|
| 1007   | 347.25               |

Average revenues by state

**FIGURE 12-20** Multiple-row subquery in a HAVING clause



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# Wrap-up

- Multiple-row subquery
- IN
- ANY
- ALL

