

Session 6-11 Subqueries 3

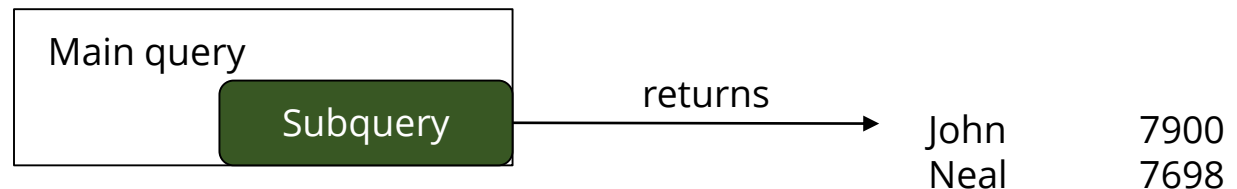
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Multiple-Column Subqueries

- Return **more than one column** in results
 - A table; rather than a list or a value
- Can return more than one row
- Column list on the left side of operator must be in parentheses
- Use the IN operator for WHERE and HAVING clauses



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Multiple-Column Subquery in a FROM Clause

- Creates a temporary table

```
SELECT title, retail, category, cataverage
FROM books JOIN (SELECT category, AVG(retail) cataverage
                 FROM books
                 GROUP BY category)
               USING(category)
WHERE retail > cataverage;
```

Execute Load Script Save Script Cancel

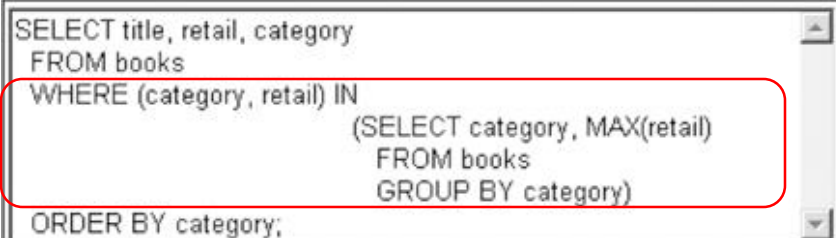
TITLE	RETAIL	CATEGORY	CATAVERAGE
BUILDING A CAR WITH TOOTHPICKS	59.95	CHILDREN	34.45
DATABASE IMPLEMENTATION	55.95	COMPUTER	52.85
HOLY GRAIL OF ORACLE	75.95	COMPUTER	52.85
E-BUSINESS THE EASY WAY	54.5	COMPUTER	52.85
PAINLESS CHILD-REARING	89.95	FAMILY LIFE	55.975
THE WOK WAY TO COOK	28.75	COOKING	24.35

6 rows selected.



Multiple-Column Subquery in a WHERE Clause

- Returns multiple columns for evaluation



```
SELECT title, retail, category
FROM books
WHERE (category, retail) IN
      (SELECT category, MAX(retail)
       FROM books
       GROUP BY category)
ORDER BY category;
```

Execute Load Script Save Script Cancel

TITLE	RETAIL	CATEGORY
HOW TO MANAGE THE MANAGER	31.95	BUSINESS
BUILDING A CAR WITH TOOTHPICKS	59.95	CHILDREN
HOLY GRAIL OF ORACLE	75.95	COMPUTER
THE WOK WAY TO COOK	28.75	COOKING
PAINLESS CHILD-REARING	89.95	FAMILY LIFE
BODYBUILD IN 10 MINUTES A DAY	30.95	FITNESS
SHORTEST POEMS	39.95	LITERATURE
HOW TO GET FASTER PIZZA	29.95	SELF HELP

8 rows selected.



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FIGURE 12-24 Multiple-column subquery in a WHERE clause

Multiple-Column Subquery in a WHERE Clause – Alternative 1

- Replaced with two single-column subqueries
- Same output

```
SELECT title, retail, category
FROM books
WHERE category IN (SELECT DISTINCT category FROM books)
AND retail IN (SELECT max(retail) FROM books GROUP BY category)
```

Execute

Load Script

Save Script

Cancel

TITLE	RETAIL	CATEGORY
BODYBUILD IN 10 MINUTES A DAY	30.95	FITNESS
PAINLESS CHILD-REARING	89.95	FAMILY LIFE
BUILDING A CAR WITH TOOTHPICKS	59.95	CHILDREN
HOLY GRAIL OF ORACLE	75.95	COMPUTER
THE WOK WAY TO COOK	28.75	COOKING
HOW TO GET FASTER PIZZA	29.95	SELF HELP
HOW TO MANAGE THE MANAGER	31.95	BUSINESS
SHORTEST POEMS	39.95	LITERATURE



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Multiple-Column Subquery in a WHERE Clause – Alternative 2

- Replaced with Multiple-column subquery in a FROM clause
- Same output

```
SELECT title, retail, b.category  
FROM books b,  
(SELECT category, MAX(retail) max  
FROM books  
GROUP BY category) s  
WHERE b.category = s.category  
AND retail = max
```

Execute

Load Script

Save Script

Cancel

TITLE	RETAIL	CATEGORY
BODYBUILD IN 10 MINUTES A DAY	30.95	FITNESS
BUILDING A CAR WITH TOOTHPICKS	59.95	CHILDREN
HOLY GRAIL OF ORACLE	75.95	COMPUTER
PAINLESS CHILD-REARING	89.95	FAMILY LIFE
THE WOK WAY TO COOK	28.75	COOKING
HOW TO GET FASTER PIZZA	29.95	SELF HELP
HOW TO MANAGE THE MANAGER	31.95	BUSINESS
SHORTEST POEMS	39.95	LITERATURE

8 rows selected.



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Nested Subqueries

- Maximum of 255 subqueries if nested in the WHERE clause
- No limit if nested in the FROM clause
- Innermost subquery is resolved first, then the next level, etc.



Nested Subqueries

- Innermost is resolved first (3), then the second level (2), then the outer query (1)



```
SELECT customer#, lastname, firstname
FROM customers JOIN orders USING(customer#) ①
WHERE order# IN
    (SELECT order#
     FROM orderitems JOIN orders USING(order#) ②
     GROUP BY order#
     HAVING COUNT(*) IN
         (SELECT MAX(COUNT(*))
          FROM orderitems
          GROUP BY order#)); ③
```

Execute Load Script Save Script Cancel

CUSTOMER#	LASTNAME	FIRSTNAME
1007	GIANA	TAMMY
1017	NELSON	BECCA



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Wrap-up

- Multiple-column subquery
- Used in FROM/WHERE/HAVING clause

