Session 6-9 Subqueries 1

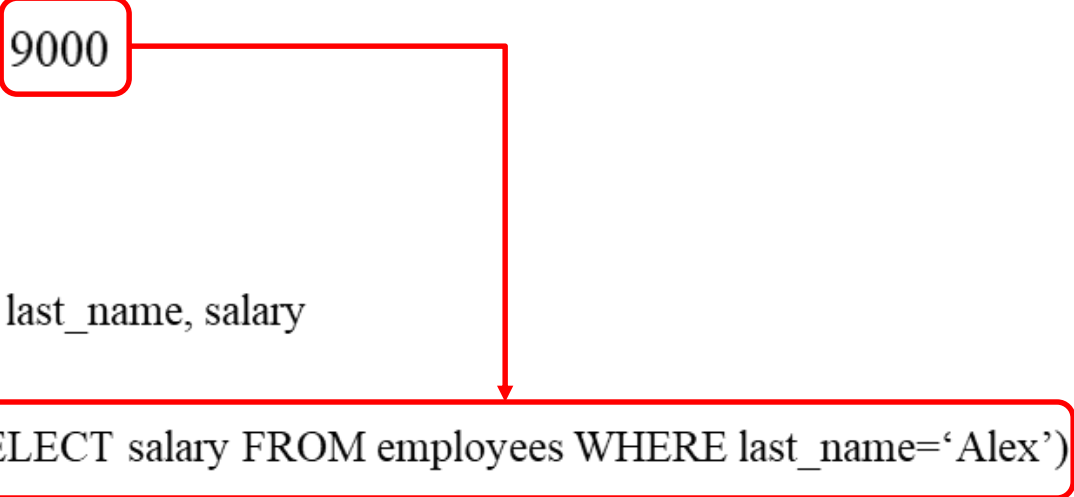Kyunghee Lee, PhD

Subqueries and Their Uses

- Subquery: a query nested inside another query
- Used when a query is based on an unknown value, list, or table
- Requires SELECT and FROM clauses
- Must be enclosed in parentheses
- Place on right side of comparison operator

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Subqueries and Their Uses

```
SELECT first_name, last_name, salary
FROM employees
WHERE salary > 9000
```

```
SELECT first_name, last_name, salary
FROM employees
WHERE salary > (SELECT salary FROM employees WHERE last_name='Alex')
```
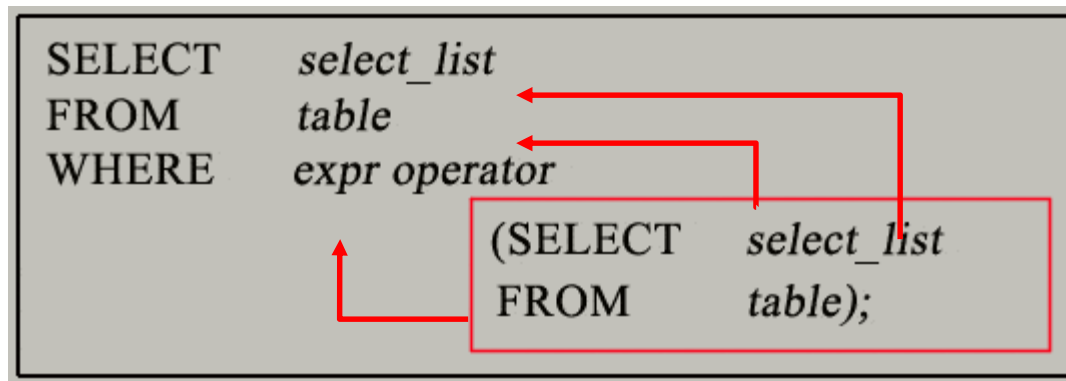
Subqueries Syntax

Main query; Outer query

```
SELECT      select_list
FROM        table
WHERE       expr operator
                    (SELECT      select_list
                     FROM        table);
```

Subquery; Inner query

Types of Subqueries

- Single-row: returns to the outer query one row of results that consists of one column
  - Returns a value

- Multiple-row: returns to the outer query more than one row of results
  - Returns a list of values

- Multiple-column: returns to the outer query more than one column of results
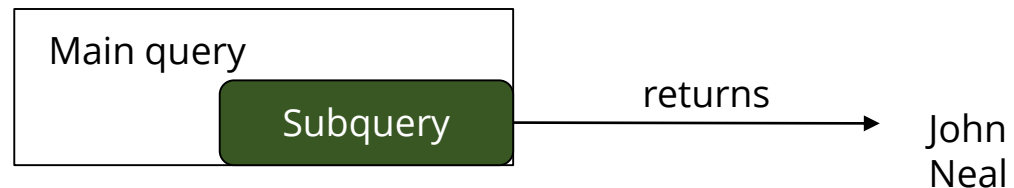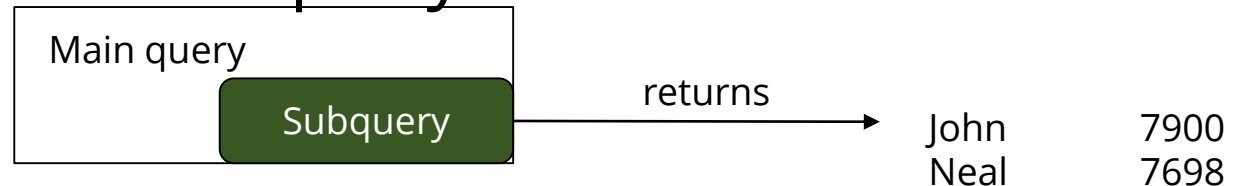 - Returns a table

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Types of Subqueries

- Single-row subquery

Main query

Subquery → returns → John

- Multiple-row subquery

Main query

Subquery → returns → John
Neal

- Multiple-column subquery

Main query

Subquery → returns →

John	7900
Neal	7698
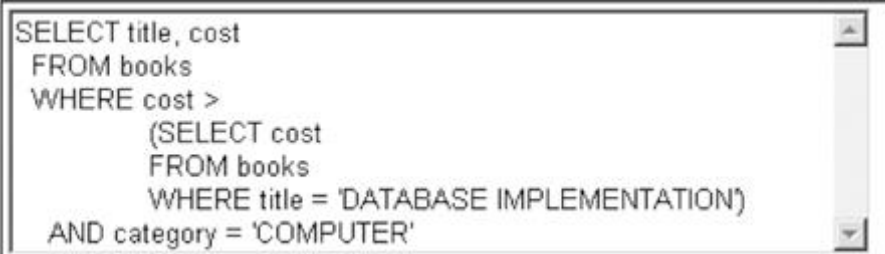
Single-Row Subqueries

- Can only return <u>one</u> result to the outer query
- Operators include =, >, <, >=, <=, < >

```
Main query
        Subquery          returns      Clerk
```
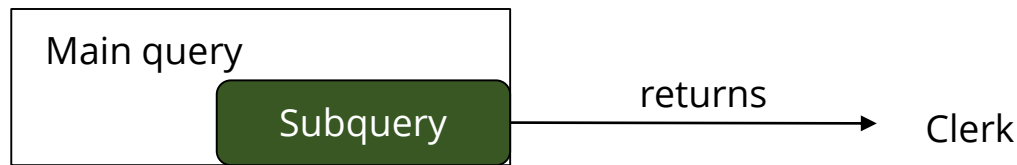
Single-Row Subquery in a WHERE Clause

- To replace an unknown value
- Q) List the titles of books with a cost higher than the cost of the book "DATABASE IMPLEMENTATION"

```
SELECT title, cost
 FROM books
 WHERE cost >
          (SELECT cost
          FROM books
          WHERE title = 'DATABASE IMPLEMENTATION')
 AND category = 'COMPUTER'
```

Execute   Load Script   Save Script   Cancel

TITLE	COST
HOLY GRAIL OF ORACLE	47.25
E-BUSINESS THE EASY WAY	37.9

Single-Row Subquery in a HAVING Clause

- Required when returned value is compared to grouped data

```
SELECT category, AVG(retail-cost) "Average Profit"
  FROM books
  GROUP BY category
  HAVING AVG(retail-cost) >
                    (SELECT AVG(retail-cost)
                       FROM books
                       WHERE category = 'LITERATURE');
```

(Execute)   (Load Script)   (Save Script)   (Cancel)

CATEGORY	Average Profit
COMPUTER	18.2625
FAMILY LIFE	24.875

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Wrap-up

- Subquery
- Single-row subquery
  - WHERE
  - HAVING

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