

Subquery

A **subquery** (also known as an inner query or nested query) is a query embedded within another SQL query, usually inside a `SELECT`, `INSERT`, `UPDATE`, or `DELETE` statement. The outer query (or main query) uses the result of the subquery to further filter or process the data.

What:

A **subquery** retrieves data to be used by another query. It allows one query to be used as a filter or condition in another query.

How:

- A subquery is placed inside parentheses and can be used in:
 - `SELECT` to compare or filter results.
 - `INSERT` to insert data based on the results of another query.
 - `UPDATE` to update records based on subquery results.
 - `DELETE` to remove rows that match the subquery criteria.
- **Example Syntax:**

```
SELECT column_name FROM table_name
WHERE column_name = (SELECT column_name FROM another_table WHERE
condition);
```

Example (EMP Table): Find employees who earn more than the average salary.

- **SQL Query:**

```
SELECT ENAME, SAL
FROM EMP
WHERE SAL > (SELECT AVG(SAL) FROM EMP);
```

- **Explanation:**
 - **Outer Query:** `SELECT ENAME, SAL FROM EMP WHERE SAL > ...` retrieves the employee name (`ENAME`) and salary (`SAL`) from the `EMP` table for employees whose salary is greater than the result of the subquery.
 - **Subquery:** `(SELECT AVG(SAL) FROM EMP)` calculates the average salary across all employees. The outer query then compares each employee's salary with this average.
 - **Result:** The outer query returns the names and salaries of employees whose salary is higher than the average salary.
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More Examples:

1. Find employees who work in the same department as employee 'ALLEN'

- **SQL Query:**

```
SELECT ENAME, DEPTNO
FROM EMP
WHERE DEPTNO = (SELECT DEPTNO FROM EMP WHERE ENAME = 'ALLEN');
```

- **Explanation:**

- **Subquery:** (SELECT DEPTNO FROM EMP WHERE ENAME = 'ALLEN') retrieves the department number (DEPTNO) of employee 'ALLEN'.
- **Outer Query:** The outer query retrieves the names and department numbers of all employees who work in the same department as 'ALLEN'.

2. Get employees who joined after 'JONES'

- **SQL Query:**

```
SELECT ENAME, HIREDATE
FROM EMP
WHERE HIREDATE > (SELECT HIREDATE FROM EMP WHERE ENAME = 'JONES');
```

- **Explanation:**

- **Subquery:** (SELECT HIREDATE FROM EMP WHERE ENAME = 'JONES') retrieves the hire date of employee 'JONES'.
- **Outer Query:** The outer query retrieves the names and hire dates of employees who were hired after 'JONES'.

4. Find employees who do not have a manager (use subquery with IS NULL)

- **SQL Query:**

```
SELECT ENAME
FROM EMP
WHERE MGR IS NULL;
```

- **Explanation:** This query selects the names of employees who do not have a manager (MGR is NULL). In this case, no subquery is required because IS NULL directly checks the condition, but this type of check is common when comparing with results from subqueries.
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