

SUB-QUERY:

Query: A query is a set of statements followed by multiple conditions which is used to interact with database.

Sub-Query: A query written inside another query is known as Sub-Query.

Syntax:

Select *

From Table1_Name

Where <Condition> (Select *

From Table2_Name

Where <Condition> (Select *

From Table3_Name

Where <Condition>));

Working Procedure:

- Let us consider two queries Outer Query and Inner Query.
- The compiler will give control to Inner Query, now Inner Query executes first based on the condition given and produces an Output.
- The Output of the Inner Query is given/fed as an Input to the Outer Query.
- The Outer Query will execute based on conditions given along with considering the input taken from Inner Query and generates the Final Output.
- Therefore we can state that the “Outer Query is dependent on Inner Query”.

Types of Sub-Query:

1. Single - Row Sub - Query
2. Multi - Row Sub – Query

Why / When do we use Sub – Query:

Case 1: Whenever we have unknowns present in the question we use Sub – Query to find the unknown.

Examples:

1. WAQTD details of the employees earning less than Miller.

Select *

From employee

Where Salary < (Select Salary

From employee

Where EmpName='Miller');

2. WAQTD names of the employees earning greater than Adams.

Select EmpName

From employee

Where Salary > (Select Salary

From employee

Where EmpName='Adams');

3. WAQTD Ename, salary and designation of the employees who's annual salary is more than Smith and less than King.

Select EmpName, Salary, Designation

From employee

Where Salary*12 > (Select Salary*12

From employee

Where EmpName='Smith' and Salary*12<(Select Salary*12

From employee

Where EmpName='King'));

4. WAQTD name of the employees who's name starts with 'a' and works in the same department as Blake.

Select EmpName

From employee

Where EmpName like 'A%' and DeptNo= (Select DeptNo

From employee

Where EmpName='Blake');

Case 2: Whenever the data to be selected and condition to be executed are present in different tables then we go for Sub-Query.

Examples:

1. WAQTD Department name of the employee's who's name is Miller.

Select DeptName

From Department

Where DeptNo=(Select DeptNo

From employee

Where EmpName='Miller');

2. WAQTD Location of Adams.

Select Location

From Department

Where DeptNo=(Select DeptNo

From employee

Where EmpName='Adams');

3. WAQTD details of the employees working as Manager in department Banking.

Select *

From employee

Where Designation='Manager' and DeptNo=(Select DeptNo

From department

Where DeptName='Banking');

4. WAQTD number of employees working in New York.

Select count(*)

From employee

Where DeptNo=(Select DeptNo

From department

Where Location='New York');

Sub-Query by using Max and Min:

1. WAQTD name of the employee getting a maximum salary.

Select EmpName

From employee

Where Salary = (Select max(Salary)

From employee);

2. WAQTD name and salary earned by the employee getting Minimum salary.

Select EmpName, Salary

From employee

Where Salary=(Select min(Salary)

From employee);

3. WAQTD name, Salary and Commission of the employee earning maximum commission.

Select EmpName, Salary,Commission

From employee

Where commission=(Select max(Commission)

From employee);

4. WAQTD details of the employee who has the greatest Employee number.

Select *

From employee

Where EmpNo=(Select max(EmpNo)

From employee);

Case 3: Mapping values present in the same table but in different rows (nth max and nth min values) (It is also called as Nested Sub-Query).

NESTED SUB-QUERY: A sub-query written inside a sub-query is called a **Nested Sub-Query**.

Examples:

1. WAQTD second maximum salary given to an employee.

```
Select max(Salary)
From employee
Where Salary<(Select max(Salary)
                From employee);
```

2. WAQTD 4th maximum salary given to an employee.

```
Select max(Salary)
From employee
Where Salary<(Select max(Salary)
                From employee
                Where Salary<(Select max(Salary)
                                From employee)))
```

Types of Sub-Query:

1. Single-Row Sub-Query
2. Multi-Row Sub-Query

1. Single-Row Sub-Query:

- If the inner query returns exactly a single record as an output, it is called **Single-Row Sub-Query**.
- If the inner query generates exactly one record as output, we can compare by using all relational operators.

2. Multi-Row Sub-Query:

- If the inner query returns more than a single record as an output, it is called a **Multi-Row Sub-Query**.
- If the inner query generates more than a single record as output, we cannot compare using a relational operator, so we should use Special operators such as IN, NOT IN, ANY and BETWEEN.

Note: It is difficult to identify whether a query belongs to a Single or Multi-Row, so it is always recommended to use Special Operators to compare the values.

SUB-QUERY OPERATORS:

1. ALL: ALL operator is a special operator which has to be used along with relational operator (>,<,>=,<=).

- ALL operator returns true only if all the values at the RHS have satisfied the condition.

Example:

1. WAQTD names of the employees if the employee earns less than the employees working as a Salesman.

Select EmpName

From employee

Where Salary < **all** (Select Salary

From employee

Where Designation='Salesman');

2. ANY: ANY operator is a special operator which has to be used along with relational operator (>,<,>=,<=).

- ANY operator returns true only if one of the values at RHS has satisfied the condition.

Example:

1. WAQTD name of the employee if the employees earns less than at least a Salesman.

Select EmpName

From employee

Where Salary < **any** (Select Salary

From employee

Where Designation = 'Salesman');

Employee and Manager Relationship:

Example:

1. WAQTD name of Allen's Manager.

Select EmpName

From employee

Where EmpNo = (Select MGR

From employee

Where EmpName = 'Allen');

2. WAQTD name of Smith's manager's manager.

Select EmpName

From employee

Where EmpNo = (Select MGR

From employee

Where EmpNo = (Select MGR

From employee

Where EmpName = 'Smith'));