A subquery, also known as a nested query or inner query, is a query that is embedded within another SQL statement. The result of a subquery is used as a condition or an operand in the main query. Subqueries are enclosed in parentheses and can be used in various parts of a SQL statement, such as the SELECT, FROM, WHERE, or HAVING clauses.

Here are some common types and examples of subqueries:

\*\*1. Scalar Subquery:\*\*

- Returns a single value and can be used in a context where a single value is expected.

```sql

SELECT EmployeeName, Salary,

(SELECT AVG(Salary) FROM Employees) AS AverageSalary

FROM Employees;

```

\*\*2. Single-Row Subquery:\*\*

- Returns one or more columns and one row. Typically used with operators like IN, =, >, <, etc.

```sql

SELECT EmployeeName, DepartmentID

FROM Employees

WHERE DepartmentID = (SELECT DepartmentID FROM Departments WHERE DepartmentName = 'IT');

```

\*\*3. Multiple-Row Subquery:\*\*

- Returns multiple rows and can be used with operators like IN, ANY, or ALL.

```sql

SELECT EmployeeName, Salary

FROM Employees

WHERE Salary > ALL (SELECT Salary FROM Employees WHERE DepartmentID = 2);

```

\*\*4. Correlated Subquery:\*\*

- References columns from the outer query, allowing the subquery to be executed once for each row processed by the outer query.

```sql

SELECT DepartmentName,

(SELECT COUNT(\*) FROM Employees WHERE Employees.DepartmentID = Departments.DepartmentID) AS EmployeeCount

FROM Departments;

```

\*\*5. EXISTS Subquery:\*\*

- Tests for the existence of rows returned by a subquery. Returns TRUE if the subquery returns one or more rows; otherwise, it returns FALSE.

```sql

SELECT EmployeeName

FROM Employees

WHERE EXISTS (SELECT \* FROM Orders WHERE Orders.EmployeeID = Employees.EmployeeID);

```

Subqueries add flexibility and allow for more complex queries by nesting one query inside another. They can be powerful tools for retrieving, filtering, or aggregating data in a structured way. The choice of which type of subquery to use depends on the specific requirements of the query.