

1. **What is Subquery? State different Types of. Subqueries.**
2. **Can we update or delete record using Subquery? Explain with Example.**
3. **What are the limitations of Subquery?**

A subquery is a query nested inside another SQL query. It is used to perform operations that will depend on the results of the outer query. Subqueries are enclosed in parentheses and can return a single value, a list of values, or a table.

## Types of Subqueries

### 1. Single-row Subquery:

- Returns only one row with one column.
- Example:

```
SELECT first_name  
  
FROM employee  
  
WHERE salary = (SELECT MAX(salary) FROM employee);
```

### 2. Multi-row Subquery:

- Returns multiple rows but only one column.
- Example:

```
SELECT first_name  
FROM employee  
WHERE dept_id IN (SELECT id FROM department WHERE location = 'Mumbai');
```

### 3. Multi-column Subquery:

- Returns multiple rows and multiple columns.
- Example:

```
SELECT first_name, last_name  
FROM employee  
WHERE (dept_id, salary) IN (SELECT id, MAX(salary) FROM department GROUP  
BY id);
```

### 4. Correlated Subquery:

- Uses values from the outer query to execute.
- Example:

```
SELECT first_name  
FROM employee e  
WHERE salary > (SELECT AVG(salary) FROM employee WHERE dept_id =  
e.dept_id);
```

### 5. Nested Subquery:

- Subqueries inside other subqueries.

subqueries can be used in UPDATE or DELETE statements.

```
UPDATE employee  
SET salary = salary * 1.10  
WHERE dept_id = (SELECT id FROM department WHERE dept_name = 'IT');
```

Delete all employees who work in the "Production" department.

```
DELETE FROM employee  
WHERE dept_id = (SELECT id FROM department WHERE dept_name = 'Production');
```

## Limitations

### 1. Performance Issues:

- Subqueries can be slower compared to joins for large datasets because they execute separately for each row in the outer query.

### 2. Scalability:

- Complex nested subqueries can be difficult to debug and maintain.

### 3. Limited Functionality:

- In some databases, you cannot modify (e.g., update or delete) a table and select from the same table in a subquery.