SQL Correlated Subqueries

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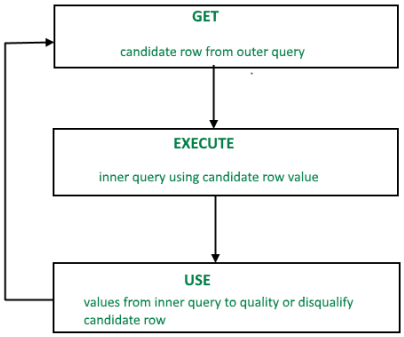
Correlated subqueries are used for row-by-row processing. Each subquery is executed once for every row of the outer query.



A correlated subquery is evaluated once for each row processed by the parent statement. The parent statement can be a **SELECT**, **UPDATE**, or **DELETE** statement.

```
SELECT column1, column2, ....
FROM table1 outer
WHERE column1 operator
                    (SELECT column1, column2
                     FROM table2
                     WHERE expr1 =
                               outer.expr2);
```

A correlated subquery is one way of reading every row in a table and comparing values in each row against related data. It is used whenever a subquery must return a different result or set of results for each candidate row considered by the main query. In other words, you can use a correlated subquery to answer a multipart question whose answer depends on the value in each row processed by the parent statement.

Nested Subqueries Versus Correlated Subqueries :

With a normal nested subquery, the inner **SELECT** query runs first and executes once, returning values to be used by the main query. A correlated subquery, however, executes once for each candidate row considered by the outer query. In other words, the inner query is driven by the outer query.

> ***NOTE:*** *You can also use the* ***ANY*** *and* ***ALL*** *operator in a correlated subquery.* ***EXAMPLE of Correlated Subqueries :*** *Find all the employees who earn more than the average salary in their department.*

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```
SELECT last_name, salary, department_id
 FROM employees outer
 WHERE salary >
                (SELECT AVG(salary)
                 FROM employees
                 WHERE department_id =
                        outer.department_id group by department_id);
```

Other use of correlation is in **UPDATE** and **DELETE**

CORRELATED UPDATE :

```
UPDATE table1 alias1
 SET column = (SELECT expression
               FROM table2 alias2
               WHERE alias1.column =
                     alias2.column);
```

Use a correlated subquery to update rows in one table based on rows from another table.

CORRELATED DELETE :

```
DELETE FROM table1 alias1
 WHERE column1 operator
               (SELECT expression
```

```
FROM table2 alias2
WHERE alias1.column = alias2.column);
```

Use a correlated subquery to delete rows in one table based on the rows from another table.

Using the EXISTS Operator :

The EXISTS operator tests for existence of rows in the results set of the subquery. If a subquery row value is found the condition is flagged **TRUE** and the search does not continue in the inner query, and if it is not found then the condition is flagged **FALSE** and the search continues in the inner query.

EXAMPLE of using EXIST operator :

Find employees who have at least one person reporting to them.

```
SELECT employee_id, last_name, job_id, department_id
FROM employees outer
WHERE EXISTS ( SELECT 'X'
FROM employees
WHERE manager_id =
outer.employee_id);
```

OUTPUT :

EMPLOYEE_ID	LAST_NAME	JOB_ID	DEPARTMENT_ID
100	King	AD_PRES	90
101	Kochhar	AD_VP	90
102	De Haan	AD_VP	90
103	Hunold	IT_PROG	60
108	Greenberg	FI_MGR	100
114	Raphaely	PU_MAN	30
120	Weiss	ST_MAN	50
121	Fripp	ST_MAN	50
122	Kaufling	ST_MAN	50
123	Vollman	ST_MAN	50
More than 10 rows available. Increase rows selector to view more rows.			

10 rows returned in 0.05 seconds CSV Export

EXAMPLE of using NOT EXIST operator :

Find all departments that do not have any employees.

```
SELECT department_id, department_name
FROM departments d
WHERE NOT EXISTS (SELECT 'X'
FROM employees
```

```
WHERE department_id
= d.department_id);
```

OUTPUT :

DEPARTMENT_ID	DEPARTMENT_NAME
120	Treasury
130	Corporate Tax
140	Control And Credit
150	Shareholder Services
160	Benefits
170	Manufacturing
180	Construction
190	Contracting
200	Operations
210	IT Support
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Last Updated : 11 Dec, 2022

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