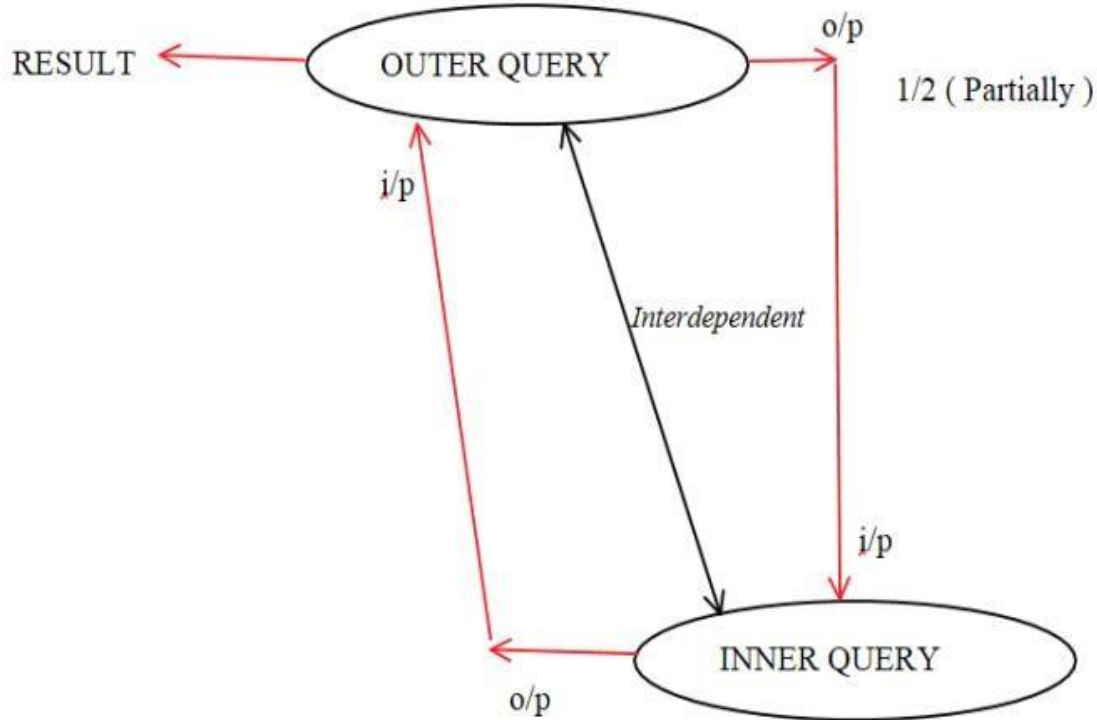


CO - RELATED SUB QUERY

A query written inside another query such that the outer query and the inner query are Dependent on each other , this is known as Co-Related Sub-Query .

WORKING PRINCIPLE :



Let us consider two queries inner and outer query respectively ,

1. Outer query executes first but partially
2. The partially executed output is given as an input to the inner Query
3. The inner query executes completely and generates an output
4. The output of inner query is fed as an input to the Outer query and Outer Query produces the result .
5. Therefore, we can state that the outer query and the inner query both are INTERDEPENDENT (dependent on each other) .

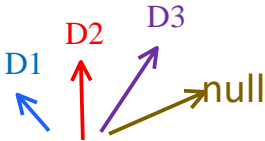
NOTE :

- i. In co-related sub query a Join condition is a must , And must be written only in the Inner Query .
- ii. Co-Related sub query works with the principles of both SUB QUERY & JOINS .

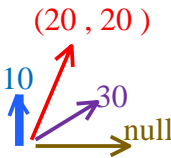
Example :

DNAME	DNO
D1	10
D2	20
D3	30
D4	40

ENAME	DNO
A	20
B	10
C	20
D	30



SELECT DNAME
FROM DEPT D



WHERE D.DNO IN (SELECT E.DNO
FROM EMP E
WHERE D.DNO= E.DNO);

10
20
30
40

10 IN 10	True
20 IN	(20 , 20)
20 = 20	TRUE
20 = 20	TRUE
30 IN 30	True
40 IN Null	Null

10 = 20	False
10 = 10	True
10 = 20	False
10 = 30	False

20 = 20	True
20 = 10	False
20 = 20	True
20 = 30	False

30 = 20	False
30 = 10	False
30 = 20	False
30 = 30	True

40 = 20	False
40 = 10	False
40 = 20	False
40 = 30	False

1. WAQTD dnames in which there are employees working .

```
SELECT DNAME
FROM DEPT D
WHERE D.DEPTNO IN ( SELECT E.DEPTNO
                    FROM EMP E
                    WHERE D.DEPTNO = E.DEPTNO ) ;
```

2. WAQTD dname in which there are no employees working .

```
SELECT DNAME
FROM DEPT D
WHERE D.DEPTNO NOT IN ( SELECT E.DEPTNO
                       FROM EMP E
                       WHERE D.DEPTNO = E.DEPTNO ) ;
```

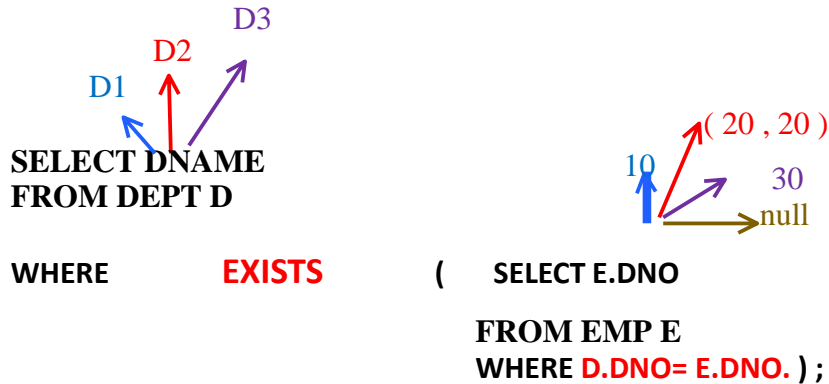
DIFFERENCE BETWEEN SUB QUERY AND CO RELATED SUB QUERY.

<u>SUB QUERY</u>	<u>CO-RELATED SUB QUERY</u>
Inner query executes first	Outer query executes first
Outer query is dependent on inner query	Both are interdependent
Join condition not mandatory	Join condition is mandatory and must be written in inner query
Outer query executes Once	Outer query executes Twice .

EXISTS & NOT EXISTS OPERATORS

1. EXISTS :

- Exists Op is a Unary Op (One Operand) which can accept One Operand Towards RHS and that Operand has to be a Co-related Sub Query .
- Exists Op returns true if the Sub Query returns Any value other than Null.



10 = 20	False
10 = 10	True
10 = 20	False
10 = 30	False

20 = 20	True
20 = 10	False
20 = 20	True
20 = 30	False

30 = 20	False
30 = 10	False
30 = 20	False
30 = 30	True

40 = 20	False
40 = 10	False
40 = 20	False
40 = 30	False

2. **NOT EXISTS :**

- Not Exists Op is a Unary Op (One Operand) which can accept One Operand Towards RHS and that Operand has to be A Co-related Sub Query.
- Not Exists Op returns true if the Sub Query returns NULL .

To Find MAX & MIN salary

To find MAXIMUM salary :

```
SELECT SAL FROM  
EMP E1  
WHERE ( SELECT COUNT( DISTINCT SAL )  
        FROM EMP E2  
        WHERE E1.SAL < E2.SAL ) = N-1 ;
```

TO FIND 3rd max salary (N = 3):

E1.SAL
1000
3000
2000
3000
2000
4000
5000

```
SELECT SAL  
FROM EMP E1  
WHERE (SELECT COUNT (DISTINCT SAL)  
        FROM EMP E2  
        WHERE E1.SAL < E2.SAL) = 2;
```

E1.SAL
1000
3000
2000
3000
2000
4000
5000

E2.SAL
1000
3000
2000
3000
2000
4000
5000

2nd , 4th , 5th , 7th MAX salary:

```
SELECT SAL
FROM EMP E1
WHERE ( SELECT COUNT( DISTINCT SAL )
        FROM EMP E2
        WHERE E1.SAL < E2.SAL ) in ( 1 , 3, 4 , 6 ) ;
```

To find MINIMUM salary :

```
SELECT SAL
FROM EMP E1
WHERE ( SELECT COUNT( DISTINCT SAL )
        FROM EMP E2
        WHERE E1.SAL > E2.SAL ) = N-1 ;
```