

SQL Sub Query / Nested Queries

SQL Sub Query

Definition: A Sub query is a query within another SQL query and embedded within the WHERE clause.

Important Rules:

- A sub query can be placed in a number of SQL clauses like WHERE, FROM and HAVING clause.
- You can use Sub query with CRUD statements along with the operators like =, <, >, >=, <=, IN, BETWEEN, etc.
- The outer query is known as the main query, and the inner query is known as a sub query.
- Sub queries are on the right side of the comparison operator and are enclosed in parentheses.
- In the Sub query, ORDER BY command cannot be used. But GROUP BY command can be used to perform the same function as ORDER BY command.

SQL Sub Query | SELECT statement

- SQL sub-queries are most frequently used with the Select statement.
- **Syntax:**
*Select colName FROM tableName WHERE colName expression
operator (SELECT colName from tableName WHERE ...);*
- **Question:** Print all the details of the employee who is earning highest salary from EMP table.
- **Query:** *Select * from EMP where salary = (Select max(salary) from EMP);*

SQL Sub Query | INSERT Statement

- In the insert statement, data returned from the sub-query is used to insert into another table.
- In the sub-query, the selected data can be modified with any of the character, date functions.

- **Syntax:**

INSERT INTO table_name (col1, col2, col3, ..., colN) SELECT col1, col2, col3, ..., colN FROM table_name WHERE VALUE OPERATOR;

- **Question:** Insert employee information into empDuplicate table by retrieving information of the employee who is having empId value is 122;
- **Query:** *Insert into empDuplicate (empId, empName, deptNo, salary, comm) Select * from EMP where empId = 122;*

SQL Sub Query | UPDATE Statement

- The sub-query of SQL can be used in conjunction with the Update statement.
- When a sub-query is used with the Update statement, then either single or multiple columns in a table can be updated.
- **Syntax:**
Update table set colName = new_value where value operator (select colName from tableName where condition);
- **Question:** Update salary by incrementing 25% to the existing salary of employee who is drawing highest salary from EMP table.
- **Query:** *Update EMP set salary = (salary + (salary * 0.25)) where empId = (Select empId from EMP where salary = (Select max(sal) from EMP));*

SQL Sub Query | DELETE Statement

- The sub-query of SQL can be used in conjunction with the Delete statement just like any other statements.
- **Syntax:**
DELETE FROM TABLE_NAME WHERE VALUE OPERATOR (SELECT COLUMN_NAME FROM TABLE_NAME WHERE condition);
- **Question:** Delete the record of an employees who are working under manager named Mr. Ravindra;
- **Query:** *Delete from EMP where managerId = (Select empId from EMP where empName LIKE '%Ravindra');*

SQL Sub Query | Types

Three Types of sub-queries:

- **Single row sub-query:**
 - It returns only one row from the inner select statement
- **Multiple row sub-queries:**
 - It returns more than one row from the inner select statement
- **Multiple column sub-queries:**
 - It returns more than one column from the inner select statement

SQL Sub Query | Single row sub-query

- **Question:** Get the details of all the employees having who are earning more than the Mr.SMITH
- **Query:** *SELECT * FROM EMP WHERE SAL > (SELECT SAL FROM EMP WHERE ENAME LIKE 'SMITH');*
- **Question:** Get the details of the person having the minimum salary
- **Query:** *SELECT ENAME, JOB, SAL FROM EMP WHERE SAL = (SELECT MIN (SAL) FROM EMP);*
- **Question:** Write a query to display the employee details who are getting maximum salary in sales department
- **Query:** *SELECT ENAME, SAL, DEPTNO FROM EMP WHERE SAL = (SELECT MAX(SAL) FROM EMP WHERE DEPTNO = (SELECT DEPTNO FROM DEPT WHERE DNAME='SALES'));*

SQL Sub Query | Single row sub-query

- **Question:** Write a query to display the employees who are working in sales department.
- **Query:** *Select ename from emp where deptno = (select deptno from dept where dname='SALES');*

- **Question:** Write a query to display the employees who are working with "SMITH" department number from emp table.
- **Query:** *Select ename from emp where deptno = (select deptno from emp where ename='SMITH');*

- **Question:** Write a query to display senior employee details from emp.
- **Query:** *Select * from emp where hiredate = (select min(hiredate) from emp);*

SQL Sub Query | Single row sub-query

- **Question:** Write a query to display highest paid employee department name.
- **Query:** *Select dname from dept where
deptno = (select deptno from emp where
sal=(select max(sal) from emp));*
- **Question:** Write a query to display the employees who are working under BLAKE.
- **Query:** *Select * from emp where
mgr = (select empno from emp where ename="BLAKE");*

SQL Sub Query | Single row sub-query

- **NOTE:** In all database systems whenever child query contains nested group functions then we must use “Group BY” clause within child query.
- **Question:** Write a query to display lowest average salary job from emp table where deptno less than 30.
- **Query:** Select deptno, min(sal) from emp group by deptno having min(sal) > (select min(sal) from emp where deptno = 30);
- **Question:** Write a query to display the employees who are working sales department from emp, dept tables.
- **Query:** Select ename, dname from emp ewhere deptno = (select deptno from dept where dname = “SALES”);

SQL Sub Query | Multiple row sub-query

- Multiple row sub-queries: It returns more than one row from the inner select statement
- The Multiple row operators are IN,ANY,ALL
 - IN: Equal to any member IN the list,
 - ANY: Compares values to each value returned by sub query
 - ALL: Compares values to every value returned by sub query
- **Question:** List the employees who are not working in sales department.
- **Query:** *SELECT * FROM EMP WHERE
DEPTNO IN (SELECT DEPTNO FROM DEPT WHERE
DNAME <> 'SALES');*

SQL Sub Query | Multiple row sub-query

- **Question:** Write a query to display the employee details who are getting max(sal) in each department from emp table.
- **Query:** *Select * from emp where sal in (select max(sal) from emp group by deptno);*
- **Question:** Write a query to display the employees who are working in sales or research department.
- **Query:** *Select ename, deptno from emp where deptno in (select deptno from dept where dname="SALES" or dname="RESEARCH");*
- **Question:** Write a query to display the employees who are working as “supervisors” (managers) from emp table.
- **Query:** *Select * from emp where empno in (select mgr from emp);*

SQL Sub Query | Multiple column sub-query

- Syntax: `Select col1, col2,..... from tableName where (col1, col2, ...) in (select col1, col2, from tableName where <condition>);`
- **Question:** Find the department number, name, job title and salary of those people who have the same job title and salary as those are in department10.
- **Query:** *`SELECT DEPTNO,ENAME, JOB, SAL FROM EMP WHERE (JOB, SAL) IN (SELECT JOB, SAL FROM EMP WHERE DEPTNO=10);`*