Subqueries

Subqueries are another way to join multiple table together. Most things that can be accomplished with a join can also be accomplished with a subquery.

Subqueries can be written for single-row and multiple-rows depending on what is required to solve the problem. We can also can use functions with subqueries as long as we use single-row functions with a single-row query and conversely multiple-row functions with multiple-row queries.

Layout of a subquery

When we are working with subqueries we actually will have two or more queries with the innermost query result set being used by the outer query or the main query.

In essence a subquery is equivalent to performing two sequential queries and using the results of the first query as the search value in the second query.

Subqueries

A subquery is a SELECT statement embedded in a clause of another SELECT statement. We an place a subquery in a number of SQL clauses.

We can place them in the:

WHERE clause

HAVING clause

FROM clause

This type of query can also be referred to as:

A NESTED Select, a Sub-Select or an INNER-Select. The inner query is always enclosed in ().

Subqueries Guidelines

Enclose subqueries in parentheses.

Place subqueries on the RIGHT side of the comparison operator

Do not add an ORDER BY clause to a subquery.

Use single-row operators with single-row subqueries which will return one row.

Use multiple-row operators with multiple-row subqueries which will return more than one row.

We can also have multiple-column subqueries that return more than one column from the inner SELECT statement.

Subqueries

Every subquery will use a comparison operator. There are two types of comparison operators with an understanding of the difference required to create an effective subquery.

1) Single-row comparison operators:

>, =, >=, <, <>, <=.

2) Multiple-row comparison operators:

IN, ANY, ALL.

We can also have Multiple-column subqueries that return more than one column from the inner SELECT statement.

Failure to use the operators correctly will result in the query not functioning properly.

Subqueries

The execution of the subquery is as follows:

The subquery (inner query) executes once before the main query.

The results of the subquery is used by the main query (outer query).

If you have more than one inner query, the innermost query is executed first and we gradually work our way out to the main query.

Subqueries Example

We want to know all employees that make more money than the employee with the number of 7566. To do this we have an inner query that will return his salary into the outer query.

```
SELECT ename
FROM emp
WHERe sal > (SELECT sal
             from EMP
             WHERE empno = 7566);
```

Single-Row Subqueries

A Single-Row subquery is one that returns ONE and only one row from the inner SELECT statement.

The operators we use is(are):

=	Equal to
>	Greater than
>=	Greater Than or equal to
<	Less than
<=	Less Than or equal to
<>	Not equal to

Group Functions in a Subquery

We can display data from a main query by using a group function in a subquery to return a single row.

We want to display the name, job title, and salary of all employees whose salary is equal to the minimum salary.

```
Select ename, job, sal
from emp
where sal = (select min(sal)
                from emp);
```

HAVING clause in a Subquery

```
SELECT deptno, MIN(SAL)
FROM emp
GROUP by deptno
HAVING MIN(SAL) >
        (SELECT MIN(SAL)
        FROM emp
        WHERE deptno = 20);
```

Multiple-Row Subquery

A Multiple-row subquery will return more than one or more rows. When we could possible receive multiple rows we have to use Multiple-ROW Operators.

IN	Equal to any member in the list
ANY	Compares values to each value returned by the subquery.
ALL	Compares values to every value returned by the subquery.

Summary

A subquery is a SELECT statement that is embedded in a clause of another SQL statement. They will posses the following characteristics:

1) Can pass one row of data to a main statement that contains a single-row operator. (=,<>,>,>=,<,<=)

2) Can pass multiple rows of data to the main statement that contains a multiple-row operator. (IN,ANY,ALL)

3) Are processed first with the result-set being used in the outer query.

4) Can contain group functions