WEEK 10 SUBQUERIES

IM101
ADVANCED DATABASE SYSTEMS

LEARNING OUTCOMES:

1. Understand Subqueries;

2. Where and when to use subqueries;

3. Demonstrate subqueries in SQL Developer.

SUBQUERIES

- Query inside another query

- May return single number, or multiple rows, depending on how they are used

- We use a subquery to fetch data from two tables

A **SUBQUERY** is often referred to as an inner query, while the statement containing a subquery is also called an outer query or outer select

SUBQUERIES

```
SELECT      select_list
FROM        table
WHERE       expr operator

                    (SELECT      select_list
                     FROM        table);
```

SUBQUERIES can be present in the FROM clause, WHERE clause, or the SELECT clause.

We can implement
SUBQUERIES with the

SELECT
INSERT
UPDATE
DELETE

SUBQUERIES

Comparison operators can be used

>	>=
<	<=
=	
IN	BETWEEN

SUBQUERIES GUIDELINES

When using subqueries there are some guidelines to consider

- A subquery must be enclosed in parentheses.

- A subquery must put on the comparison operators right hand side

- Subqueries cannot modify their outcomes internally

- Subqueries that return over one row can only be used with multiple value operators such as the IN operator.

- SQL Server allows you to nest subqueries up to 32 levels.

ORACLE SUBQUERIES

- You can nest up to 255 levels of subqueries in the a nested subquery

- A subquery can contain another subquery.

- Oracle Database imposes no limit on the number of subquery levels in the FROM clause of the top-level query.

- You can nest up to 255 levels of subqueries in the WHERE clause.

Reference: https://docs.oracle.com/en/database/oracle/oracle-database/19/sqlrf/Using-Subqueries.html

SUBQUERIES TYPES

Types of Subqueries

- Single subquery line: returns zero or a row.

- Many subqueries in columns: returns one column or more.

- Correlated subqueries: The outer SQL statement applies to one or more columns.

- Nested subqueries: Put subqueries within another subquery.

SUBQUERIES

To perform the following tasks:

```
SELECT      select_list
FROM        table
WHERE       expr operator
                    (SELECT      select_list
                     FROM        table);
```

`SELECT * FROM employees;`

```sql
-- Subquery in Select
SELECT employee_id, salary, (SELECT AVG(Salary)
FROM employees) AS AllAvgSalary
FROM employees;
```

EMPLOYEE_ID	SALARY	ALLAVGSALARY
1	30000	31250
2	35000	31250
3	40000	31250
4	20000	31250

```
-- Subquery in From
SELECT a.employee_id, a.first_name, AllAvgSalary
FROM (SELECT employee_id, first_name, salary,
AVG(salary) OVER () AS AllAvgSalary FROM
employees) a;
```

EMPLOYEE_ID	FIRST_NAME	ALLAVGSALARY
1	John	31250
2	Ana	31250
3	Fuller	31250
4	Leverling	31250

```sql
-- Subquery in Where
SELECT employee_id, salary, job_id
FROM employees
WHERE job_id IN (
        SELECT job_id FROM jobs);
```

EMPLOYEE_ID	SALARY	JOB_ID
1	30000	1
2	35000	3
3	40000	2
4	20000	1

SUBQUERIES COMPARE TO JOINS

- Both joins and subqueries are used to merge data from various tables into one single result.

- Subqueries return either single value or row set, while join used to return rows

- Possible to restate most subqueries as joins and most joins can be restated as subqueries

SUBQUERIES COMPARE TO JOINS

```
select a.employee_id, a.first name, a.last name,
b.job title
from employees a
left join jobs b on a.job id = b.job id
```

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	JOB_TITLE
1	John	Dela Cruz	Database Designer
4	Leverling	Janet	Database Designer
3	Fuller	Andrew	Software Developer
2	Ana	Doe	Front End Developer

Resources

A Step-By-Step Guide To SQL Subquery

https://www.simplilearn.com/tutorials/sql-tutorial/sql-subquery#:~:text=A%20subquery%20is%20often%20also,%2C%20IN%2C%20BETWEEN%2C%20etc.

End of Lesson…