**Mastering the UNION Operator in SQL**

# Objective:

In this lesson, you will learn how to use the UNION operator to combine results from multiple queries and understand the difference between UNION and UNION ALL. You will also practice with real-world examples and datasets.

# 1. What is the UNION Operator?

The UNION operator in SQL combines the result sets of two or more SELECT queries into a single result set. The key feature of UNION is that it removes duplicate rows from the final result.

Key Points:  
- UNION: Combines results from multiple queries and removes duplicates.  
- UNION ALL: Combines results but does not remove duplicates.  
- Each query must return the same number of columns and compatible data types.

# 2. Syntax of UNION

The basic syntax for UNION is as follows:  
  
SELECT column1, column2, ...  
FROM table1  
UNION  
SELECT column1, column2, ...  
FROM table2;

Explanation:  
1. Both SELECT queries must have the same number of columns.  
2. The data types of the columns must be compatible. For example, you can't combine an integer column with a text column.

# 3. Example 1: Using UNION to Combine Data from Two Tables

Let’s create two sample tables: DomesticSales and InternationalSales, which contain sales data from two different regions.

## Create Tables:

CREATE TABLE DomesticSales (  
 SaleID INT,  
 ProductID INT,  
 SaleAmount DECIMAL(10, 2)  
);

CREATE TABLE InternationalSales (  
 SaleID INT,  
 ProductID INT,  
 SaleAmount DECIMAL(10, 2)  
);

## Insert Sample Data:

-- Inserting data into DomesticSales table  
INSERT INTO DomesticSales (SaleID, ProductID, SaleAmount) VALUES  
(1, 101, 500.00),  
(2, 102, 200.00),  
(3, 103, 300.00),  
(4, 101, 400.00);

-- Inserting data into InternationalSales table  
INSERT INTO InternationalSales (SaleID, ProductID, SaleAmount) VALUES  
(1, 101, 550.00),  
(2, 102, 250.00),  
(3, 104, 300.00),  
(4, 105, 450.00);

## Use UNION to Combine Data:

SELECT ProductID, SaleAmount FROM DomesticSales  
UNION  
SELECT ProductID, SaleAmount FROM InternationalSales;

Explanation: The UNION operator combines the sales from both tables and removes any duplicates.

# 4. Example 2: Using UNION to Combine Different Columns

Suppose we have two tables, CustomersUS and CustomersEU, and we want to combine the customer data from both regions.

## Create Tables:

CREATE TABLE CustomersUS (  
 CustomerID INT,  
 CustomerName VARCHAR(100),  
 Region VARCHAR(50)  
);

CREATE TABLE CustomersEU (  
 CustomerID INT,  
 CustomerName VARCHAR(100),  
 Region VARCHAR(50)  
);

## Insert Sample Data:

-- Inserting data into CustomersUS table  
INSERT INTO CustomersUS (CustomerID, CustomerName, Region) VALUES  
(1, 'John Doe', 'US'),  
(2, 'Jane Smith', 'US');

-- Inserting data into CustomersEU table  
INSERT INTO CustomersEU (CustomerID, CustomerName, Region) VALUES  
(3, 'Max Muller', 'EU'),  
(4, 'Anna Schmidt', 'EU');

## Use UNION to Combine Data:

SELECT CustomerID, CustomerName, 'US' AS Region FROM CustomersUS  
UNION  
SELECT CustomerID, CustomerName, 'EU' AS Region FROM CustomersEU;

Explanation: The UNION operator combines the customer data from both regions while avoiding duplicates.

# 5. Key Differences Between UNION and UNION ALL

- UNION removes duplicates from the result set.  
- UNION ALL includes all rows, even duplicates.

# 6. Example 3: Using UNION ALL to Include Duplicates

Here’s an example of using UNION ALL to retain duplicates.

## Use UNION ALL to Combine Data:

SELECT ProductID, SaleAmount FROM DomesticSales  
UNION ALL  
SELECT ProductID, SaleAmount FROM InternationalSales;

Explanation: UNION ALL ensures that all sales data from both tables are included, even if they are duplicates.

# 7. Practical Exercise: Using UNION

## Task 1: Combining Customer Data

You are given two tables: OnlinePurchases and InStorePurchases, which both contain the following columns:  
- CustomerID  
- CustomerName  
- PurchaseAmount  
  
Write a query to combine customer data from both tables, ensuring there are no duplicate customers (based on CustomerID and CustomerName).

## Task 2: Combining Product Data

You have two tables: ProductsA and ProductsB. Both tables have columns:  
- ProductID  
- ProductName  
- Price  
  
Write a query to combine the data from both tables, and make sure to include all products from both tables (i.e., include duplicates if the same product appears in both tables).