SQL: MAX

The `MAX()` function in SQL is used to find the largest value in a specified column. It is an aggregate function that returns the maximum value from a set of values. This function is useful when you want to determine the highest value in a numeric or date column.

Syntax

The basic syntax for using the `MAX()` function is:

```
SELECT MAX(column_name)
FROM table_name
WHERE condition;
```

Examples of Using `MAX()`

Let's go through some examples to illustrate how the `MAX()` function works.

Example Table: Employees

employee_id	first_name	last_name	department	salary
1	John	Doe	Sales	60000
2	Jane	Smith	Marketing	55000
3	Alice	Johnson	Sales	50000
4	Bob	Brown	IT	70000
5	Carol	White	Marketing	52000

1. **Finding the Maximum Salary**:

   Suppose you want to find the highest salary among all employees:

   ```
   SELECT MAX(salary)
   FROM Employees;
   ```

   Result:

   MAX(salary)

   70000

   This query returns the highest salary in the `salary` column, which is **70000**.

2. **Finding the Maximum Salary in a Specific Department**:

   Suppose you want to find the highest salary among employees in the Sales department:

   ```
   SELECT MAX(salary)
   FROM Employees
   WHERE department = 'Sales';
   ```

Result:

MAX(salary)
60000

This query filters the employees to only those in the Sales department and then finds the maximum salary among those employees, which is **60000**.

3. **Finding the Most Recently Hired Employee**:

   Suppose you have a `hire_date` column and you want to find the most recently hired employee:

   Updated `Employees` Table:

employee_id	first_name	last_name	department	salary	hire_date
1	John	Doe	Sales	60000	2021-03-01
2	Jane	Smith	Marketing	55000	2021-05-15
3	Alice	Johnson	Sales	50000	2020-01-10
4	Bob	Brown	IT	70000	2022-08-20
5	Carol	White	Marketing	52000	2021-07-30

   Query:

```
SELECT MAX(hire_date)
FROM Employees;
```

   Result:

MAX(hire_date)
2022-08-20

   This query returns the most recent (maximum) hire date in the `hire_date` column, which is **2022-08-20**.

4. **Combining `MAX()` with `GROUP BY`**:

   Suppose you want to find the highest salary in each department:

```
SELECT department, MAX(salary)
FROM Employees
GROUP BY department;
```

   Result:

department	MAX(salary)
Sales	60000
Marketing	55000
IT	70000

   This query groups the employees by department and calculates the maximum salary for each department.

Key Points

- **Returns the Maximum Value**: `MAX()` finds the largest value in a column.
- **Ignores `NULL` Values**: The function automatically ignores `NULL` values in the column when computing the maximum.
- **Can Be Combined with `GROUP BY`**: You can use `MAX()` with `GROUP BY` to find the maximum value for different groups of data, like departments or categories.
- **Can Include `WHERE` Clause**: Use the `WHERE` clause to filter the rows that contribute to the maximum, allowing you to calculate conditional maximums.

The `MAX()` function is a valuable tool for identifying the highest values in your data, making it useful for reporting, analysis, and decision-making.