AGGREGATE FUNCTIONS

SQL Aggregate functions are functions where the values of multiple rows are grouped as input on certain criteria to form a single value result of more significant meaning.

It is used to summarize data, by combining multiple values to form a single result.

SQL Aggregate functions are mostly used with the GROUP BY clause of the SELECT statement.

Various Aggregate Functions

1. **Count()**
2. **Sum()**
3. **Avg()**
4. **Min()**
5. **Max()**

Aggregate Functions in SQL

Below is the list of SQL aggregate functions, with examples

Count()

- **Count(*)**: Returns the total number of records .i.e 6.
- **Count(salary)**: Return the number of Non-Null values over the column salary. i.e 5.
- **Count(Distinct Salary)**: Return the number of distinct Non-Null values over the column salary .i.e 5.

Sum()

- **sum(salary)**: Sum all Non-Null values of Column salary i.e., 3120..
- **sum(Distinct salary)**: Sum of all distinct Non-Null values i.e., 3120..

Avg()

- **Avg(salary)** = Sum(salary) / count(salary) = 3120 / 5 = 624
- **Avg(Distinct salary)** = sum(Distinct salary) / Count(Distinct Salary) = 3120 / 5 = 624

Min()

- **Min(salary)**: Minimum value in the salary column except NULL i.e., 403.

Max()

- **Max(salary)**: Maximum value in the salary i.e., 802.

Demo SQL Database

In this tutorial on aggregate functions, we will use the following table for examples:

Id	Name	Salary

1	A	802
2	B	403
3	C	604
4	D	705
5	E	606
6	F	NULL

You can also create this table on your system, by writing the following queries:

```
CREATE TABLE Employee (
    Id INT PRIMARY KEY,
    Name CHAR(1),  -- Adjust data type and length if names
can be longer than a single character
    Salary DECIMAL(10,2)  -- Adjust precision and scale if
needed for salaries
);
INSERT INTO Employee (Id, Name, Salary)
VALUES
    (1, 'A', 802),
    (2, 'B', 403),
    (3, 'C', 604),
    (4, 'D', 705),
    (5, 'E', 606),
    (6, 'F', NULL);
```

Aggregate Function Example

In this example, we will use multiple aggregate functions on the data.

Queries

```
-- Count the number of employees
SELECT COUNT(*) AS TotalEmployees FROM Employee;

-- Calculate the total salary
SELECT SUM(Salary) AS TotalSalary FROM Employee;


-- Find the average salary
SELECT AVG(Salary) AS AverageSalary FROM Employee;


-- Get the highest salary
SELECT MAX(Salary) AS HighestSalary FROM Employee;
```

```
-- Determine the lowest salary
SELECT MIN(Salary) AS LowestSalary FROM Employee;
```

Output

```
TotalEmployees
6
TotalSalary
3120
AverageSalary
624
HighestSalary
802
LowestSalary
403
```

Key Takeaways about SQL Aggregate Functions

- Aggregate functions in SQL operate on a group of values and return a single result.
- They are often used with the GROUP BY clause to summarize the grouped data.
- Aggregate function operates on non-NULL values only (except COUNT).
- Commonly used aggregate functions are – MIN(), MAX(), COUNT(), AVG(), and SUM().