**Mastering SQL Aggregation: Group By, Having, and Aggregate Functions.**

## Introduction on Aggregate functions in SQL

Before going to our main concept, we must first learn- What are function and type?

**Function**in SQL is a set of [SQL statements](https://www.analyticsvidhya.com/blog/2022/05/most-important-sql-queries-for-beginners/) that performs a specific task. SQL provides a variety of functions which are grouped into two categories:

1. Single row function

2. Multiple row function.

Single row functions operate on a single row and one result per row. This function can accept one or more arguments and returns one value for each row. And can be used with **SELECT, WHERE**and **ORDER BY.**Whereas the multiple row function is used with multiple rows and gives aggregate value.

multiple row function is also known as the Aggregate function and Non-Scalar

function. In SQL normally we work on single row values but when it comes to

working on multiple rows at that time we use an aggregate function. Aggregate

functions are used to perform specific types of operations such as counting the

number of records in a table, searching maximum and minimum values from a

table, finding out the sum and average values from a table, etc. An aggregate

function ignores NULL values in a table when performing the calculation except for the COUNT() function.

SQL Aggregation Definition:

An aggregate function in SQL returns one value after calculating multiple values of a column. We often use aggregate functions with the [GROUP BY](https://www.simplilearn.com/tutorials/sql-tutorial/group-by-in-sql) and [HAVING clauses](https://www.simplilearn.com/tutorials/sql-tutorial/sql-having) of the SELECT statement.

There are 5 types of SQL aggregate functions:

* Count()

The COUNT() function returns the number of rows in a database table.

#### Syntax:

#### COUNT(\*) or  COUNT( [ALL|DISTINCT] expression).

#### Example:

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* Sum()

The SUM() function returns the total sum of a numeric column.

Syntax:

SUM()  or  SUM( [ALL|DISTINCT] expression).

#### Example:



* Avg()

The AVG() function calculates the average of a set of values.

Syntax:

AVG()  or  AVG( [ALL|DISTINCT] expression).

 Example:

* Min()

The MIN() aggregate function returns the lowest value (minimum) in a set of non-NULL values.

Syntax:

MIN()  or  MIN( [ALL|DISTINCT] expression).

 Example:

* Max()

The MAX() aggregate function returns the highest value (maximum) in a set of non-NULL values.

Syntax:

AVG()  or  AVG( [ALL|DISTINCT] expression).

Example:



Use of Aggregate Functions and Group by in SQL:

## Group by

The GROUP BY clause is a SQL command used to group rows with the same

values. The GROUP BY clause is used in the **SELECT**statement.

Also, we use the WHERE statement with GROUP BY.**WHERE**clause is used

before GROUP BY. To represent a group of values in a particular

manner **ORDER BY** clause is also used with GROUP BY and  GROUP BY

placed before the ORDER BY.

Syntax:

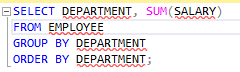
SELECT column\_name FROM table\_name

WHERE [condition]

GROUP BY column\_name

ORDER BY column\_name;

Example:



## HAVING

 Sometimes we do not want to see the whole output produced by the GROUP BY.

To filter the group of data based on a specified list of conditions the **HAVING**clause

is often used with the GROUP BY. HAVING clause is placed after GROUP BY.

Both WHERE and HAVING clauses can be used in the same query. As the WHERE

clause can not be used with aggregate functions like SUM(), AVG(), MIN(), etc…

for that reason HAVING clause is used with an aggregate function to filter the group of a result set.

Syntax:

SELECT column 1,column 2

FROM table

WHERE [conditions]

GROUP BY column 1

HAVING [condition]

ORDER BY column 1;

Example:



## **Conclusion on Aggregate functions:**

The aggregate function is one of the most powerful concepts of SQL. This article has seen all the important concepts of the aggregate function with proper examples of how they work with queries.

The key takeaways from the article are,

* We discuss the function and its types.
* Learned about types of aggregate functions with proper examples.
* Also learned how GROUP BY  is used with aggregate function and its importance. And  How the HAVING clause work with GROUP BY and aggregate function

The aggregate function in SQL is very powerful in the database. It serves

the same purpose as their equivalents in MS Excel. In this article, we have

seen several examples of aggregate functions.