

GROUP BY and HAVING in SQL

GROUP BY and **HAVING** are used for grouping and filtering aggregated data.

1. GROUP BY in SQL

- Used to group rows that have the same values in specified columns.
- Often used with aggregate functions like COUNT(), SUM(), AVG(), MAX(), MIN(), etc.
- Syntax:

```
SELECT column_name, AGGREGATE_FUNCTION(column_name) FROM  
table_name GROUP BY column_name;
```

Example 1: Using GROUP BY with COUNT()

Employee Table

Employee_ID	Name	Department	Salary
1	Alice	IT	60000
2	Bob	HR	50000
3	Charlie	IT	70000
4	David	Sales	55000
5	Eve	HR	48000

Count the number of employees in each department

```
SELECT Department, COUNT(Employee_ID) AS Employee_Count FROM Employee  
GROUP BY Department.
```

Result:

Department	Employee_Count
IT	2
HR	2
Sales	1

Example 2: Using GROUP BY with SUM()

Find the total salary paid in each department

SELECT Department, SUM(Salary) AS Total_Salary FROM Employee GROUP BY Department;

Result:

Department	Total_Salary
IT	130000
HR	98000
Sales	55000

2. HAVING in SQL

- Used to filter grouped results (after GROUP BY).
- Similar to WHERE, but WHERE cannot be used with aggregate functions.
- Syntax:

```
SELECT column_name, AGGREGATE_FUNCTION(column_name)
FROM table_name GROUP BY column_name HAVING condition;
```

Example 3: Using HAVING with COUNT()

Query: Show departments having more than 1 employee

```
SELECT Department, COUNT(Employee_ID) AS Employee_Count FROM Employee
GROUP BY Department HAVING COUNT(Employee_ID) > 1;
```

Result:

Department	Employee_Count
IT	2
HR	2

Sales department is excluded because it has only 1 employee.

Example 4: Using HAVING with SUM()

Show departments where the total salary is greater than 90,000

```
SELECT Department, SUM(Salary) AS Total_Salary FROM Employee GROUP BY
Department HAVING SUM(Salary) > 90000;
```

Result:

Department	Total_Salary
IT	130000
HR	98000

Sales is excluded because total salary (55,000) is less than 90,000.

Difference Between WHERE and HAVING

Feature	WHERE	HAVING
Used With	Filters individual rows	Filters grouped data
Works With Aggregate Functions?	No	Yes
Executes Before/After GROUP BY?	Before GROUP BY	After GROUP BY

Example:

Using WHERE (Filters before GROUP BY)

```
SELECT Department, SUM(Salary) FROM Employee WHERE Salary > 50000 GROUP BY Department;
```

Using HAVING (Filters after GROUP BY)

```
SELECT Department, SUM(Salary) FROM Employee GROUP BY Department HAVING SUM(Salary) > 90000;
```