Aggregate Functions and Grouping

Task-4

**Step-by-step Instructions**

Step 1 — Create sample table (Employees):

Run these SQL commands to create and populate a sample table you can use for practice.

CREATE TABLE Employees (

EmpID int PRIMARY KEY,

EmpName varchar(100),

Dept Varchar(100),

Salary int );

INSERT INTO Employees (EmpID, EmpName, Dept, Salary) VALUES

(1, 'Alice', 'HR', 50000),

(2, 'Bob', 'Sales', 60000),

(3, 'Charlie', 'Sales', 70000),

(4, 'Diana', 'IT', 80000),

(5, 'Evan', 'IT', 75000),

(6, 'Fiona', 'HR', 52000),

(7, 'George', 'Sales', 62000),

(8, 'Hannah', 'IT', 90000),

(9, 'Ishan', 'Finance', 68000),

(10, 'Jaya', 'Finance', 72000');

Step 2 — Basic aggregate queries (examples):

1) Count rows:

SELECT COUNT(\*) AS TotalEmployees FROM Employees;

2) Count non-null values in a column:

SELECT COUNT(Salary) AS SalariesCount FROM Employees;

3) SUM, AVG, MIN, MAX:

SELECT SUM(Salary) AS TotalSalary, AVG(Salary) AS AvgSalary,

MIN(Salary) AS MinSalary, MAX(Salary) AS MaxSalary FROM Employees;

4) ROUND average to 2 decimals :

SELECT ROUND(AVG(Salary),2) AS AvgSalaryRounded FROM Employees;

Step 3 — GROUP BY

**The GROUP BY clause in SQL Server is used to **arrange identical data into groups**.  
It is **mostly used with aggregate functions** like:**

COUNT() – Counts records

SUM() – Adds up values

AVG() – Calculates the average

MAX() – Finds the maximum value

MIN() – Finds the minimum value

Syntax:

SELECT column\_name, AGGREGATE\_FUNCTION(column\_name)

FROM table\_name

WHERE condition

GROUP BY column\_name

ORDER BY column\_name;

1. Group by Dept and show aggregates:

SELECT Dept, COUNT(\*) AS EmpCount, SUM(Salary) AS TotalSalary,

AVG(Salary) AS AvgSalary, MIN(Salary) AS MinSalary, MAX(Salary) AS MaxSalary

FROM Employees GROUP BY Dept;

Step 5 — DISTINCT

### ****Definition:****

The DISTINCT keyword is used in SQL Server to **remove duplicate records** from the result set.  
It ensures that **only unique values** are returned.

Syntax:

SELECT DISTINCT column1, column2, ...

FROM table\_name

WHERE condition;

COUNT(DISTINCT):

### ****Definition:****

COUNT(DISTINCT column\_name) is used to **count the number of unique (non-duplicate) values** in a column.

### ****Syntax:****

SELECT COUNT(DISTINCT column\_name) AS AliasName

FROM table\_name

WHERE condition;

**Interview Questions**

1. What is GROUP BY?

GROUP BY groups rows that have the same values into summary rows, often

used with aggregate functions.

1. Difference between WHERE and HAVING?

WHERE filters rows before aggregation;

HAVING filters groups after aggregation.

1. How does COUNT(\*) differ from COUNT(column)?

COUNT(\*) counts rows including those with NULLs.

COUNT(column) counts non-NULL values in that column.

1. Can you group by multiple columns?

Yes — GROUP BY col1, col2 groups rows by the unique combinations of those columns.

1. What is ROUND() used for?

ROUND() rounds numeric values to the specified number of decimal places.

1. How do you find the highest salary by department?

Use GROUP BY Dept and MAX(Salary):

SELECT Dept, MAX(Salary) FROM Employees GROUP BY Dept;

1. What is the default behavior of GROUP BY?

It groups rows by column values; without aggregates, behavior may vary—most DBs require aggregates when non-grouped columns are selected.

1. Explain AVG and SUM. SUM adds values;

AVG computes the arithmetic mean (SUM/COUNT of nonNULLs).

1. How to count distinct values?

Use COUNT(DISTINCT column).

1. What is an aggregate function?

An **aggregate function** in SQL Server **performs a calculation on a set of values** and **returns a single value** as the result.

It is commonly used with the GROUP BY clause to summarize data, such as totals, averages, or counts.