---Aggregate functions

### \*\*1. `COUNT()`\*\*

Counts the number of rows or non-NULL values in a column.

\*\*Example:\*\*

```sql

SELECT COUNT(\*) AS total\_employees

FROM employees;

```

This returns the total number of rows in the `employees` table.

```sql

SELECT COUNT(salary) AS employees\_with\_salary

FROM employees;

```

This counts the number of employees with a non-NULL salary.

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### \*\*2. `SUM()`\*\*

Calculates the total sum of a numeric column.

\*\*Example:\*\*

```sql

SELECT SUM(salary) AS total\_salary

FROM employees;

```

This returns the sum of all salaries in the `employees` table.

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### \*\*3. `AVG()`\*\*

Calculates the average value of a numeric column.

\*\*Example:\*\*

```sql

SELECT AVG(salary) AS average\_salary

FROM employees;

```

This returns the average salary of all employees.

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### \*\*4. `MIN()`\*\*

Finds the minimum value in a column.

\*\*Example:\*\*

```sql

SELECT MIN(salary) AS minimum\_salary

FROM employees;

```

This returns the lowest salary in the `employees` table.

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### \*\*5. `MAX()`\*\*

Finds the maximum value in a column.

\*\*Example:\*\*

```sql

SELECT MAX(salary) AS maximum\_salary

FROM employees;

```

This returns the highest salary in the `employees` table.

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### \*\*6. Combining Aggregate Functions\*\*

You can use multiple aggregate functions in a single query.

\*\*Example:\*\*

```sql

SELECT

COUNT(\*) AS total\_employees,

AVG(salary) AS average\_salary,

MIN(salary) AS minimum\_salary,

MAX(salary) AS maximum\_salary

FROM employees;

```

This returns:

- Total number of employees.

- Average salary.

- Minimum salary.

- Maximum salary.

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### \*\*7. Using `DISTINCT` with Aggregate Functions\*\*

You can calculate aggregate values for unique values in a column.

\*\*Example:\*\*

```sql

SELECT COUNT(DISTINCT department\_id) AS unique\_departments

FROM employees;

```

This counts the number of unique departments in the `employees` table.

```sql

SELECT AVG(DISTINCT salary) AS average\_unique\_salary

FROM employees;

```

This calculates the average of unique salary values.

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### \*\*8. Real-World Examples\*\*

#### \*\*Example 1: Total Sales\*\*

```sql

SELECT SUM(quantity \* price) AS total\_sales

FROM orders;

```

This calculates the total sales from the `orders` table.

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#### \*\*Example 2: Average Product Price\*\*

```sql

SELECT AVG(price) AS average\_price

FROM products;

```

This calculates the average price of all products.

---

#### \*\*Example 3: Highest and Lowest Product Prices\*\*

```sql

SELECT

MAX(price) AS highest\_price,

MIN(price) AS lowest\_price

FROM products;

```

This returns the highest and lowest prices from the `products` table.

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### \*\*Key Points to Remember\*\*

- Without `GROUP BY`, aggregate functions operate on the entire table or column.

- Aggregate functions ignore `NULL` values (except for `COUNT(\*)`).

- You can combine multiple aggregate functions in a single query.

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