

Aggregate Functions In SQL

Aggregate Functions in SQL perform calculations on a set of values, and returns a single value.

They are used with the **GROUP BY** clause to summarize data for each group.

The most commonly used SQL Aggregate Functions are:

- **AVG()** – Returns the average value of a numeric column
- **COUNT()** – Returns the number of rows in the result set
- **MIN()** – Returns the smallest value in the selected column
- **MAX()** – Returns the largest value in the selected column
- **SUM()** – Returns the total sum of a numeric column

AVG() Function

The **AVG()** function in SQL is used to calculate the arithmetic mean (average) of a set of numerical values.

Example:

Leet Code Problem 1075. Project Employees I

Write an SQL query that reports the average experience years of all the employees for each project, rounded to 2 digits.

```
Select p.project_id,  
Round(AVG(e.experience_years),2)  
As average_years  
From Project p Join Employee e  
On p.employee_id=e.employee_id  
Group By p.project_id;
```

COUNT() Function

The **COUNT()** function in SQL returns the number of rows that matches a specified criterion.

Example:

Leet Code Problem 2356. Number of Unique Subjects Taught by Each Teacher

Write a solution to calculate the number of unique subjects each teacher teaches in the university.

```
Select
    teacher_id,
    COUNT(Distinct subject_id) As cnt
From
    Teacher
Group By
    teacher_id;
```

MIN() & MAX() Function

The **MIN()** function in SQL returns the smallest value of the selected column. and the **MAX()** function in SQL returns the largest value of the selected column.

Example:

Leet Code Problem 1084. Sales Analysis III

Write a solution to report the products that were only sold in the first quarter of 2019. That is, between 2019-01-01 and 2019-03-31 inclusive.

```
Select
    p.product_id,
    p.product_name
From
    Product p
    Join Sales s On p.product_id = s.product_id
Group By
    p.product_id
Having
    MIN(sale_date) >= '2019-01-01'
    And MAX(sale_date) <= '2019-03-31';
```

SUM() Function

The **SUM()** function in SQL is used to calculate the total sum of values in a numeric column.

Example:

Leet Code Problem 1251. Average Selling Price

Write a solution to find the average selling price for each product. average_price should be rounded to 2 decimal places. If a product does not have any sold units, its average selling price is assumed to be 0.

```
Select p.product_id,  
COALESCE(ROUND(SUM(units*price)/SUM(units),2),0)  
As average_price  
From Prices p Left Join UnitsSold u  
On p.product_id=u.product_id  
And u.purchase_date Between  
p.start_date And p.end_date  
Group By p.product_id;
```