SQL Aggregation Functions and Grouping

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In this presentation will be covered essential SQL aggregation functions and explore how grouping and the HAVING clause work. These concepts are crucial for summarizing and analyzing data, especially when working with large datasets.

Aggregation Functions

Aggregation functions in SQL are specialized functions that perform calculations on sets of values, returning a single value. Common aggregation functions include COUNT(), SUM(), AVG(), MIN()/MAX(). All of them can be combined with GROUP BY clauses to perform calculations on distinct subsets of your data.

COUNT()

Counts the number of rows that match a specified condition.

Example:

This query returns the total number of employees.

```
SELECT COUNT(*)
FROM employees;
```

```
SELECT COUNT(field)
FROM employees;
```

SUM()

Calculates the total sum of a numeric column.

Example:

This query returns the total sum of all employees' salaries.

```
SELECT SUM(salary)
FROM employees;
```

```
SELECT SUM(field)
FROM employees;
```

AVG()

Calculates the average value of a numeric column.

Example:

This query returns the average salary of employees.

```
SELECT AVG(salary)
FROM employees;
```

```
SELECT AVG(field)
FROM employees;
```

MIN() / MAX()

Finds the minimum / maximum value in a column.

Example:

This query returns the lowest / highest salary among employees.

```
SELECT MIN(salary)
FROM employees;
```

```
SELECT MAX(salary)
FROM employees;
```

Grouping Data

The `GROUP BY` clause groups rows that have the same values in specified columns into summary rows. It is often used with aggregation functions.

Example:

This query returns the number of employees in each department.

```
SELECT department, COUNT(*)
FROM employees
GROUP BY department;
```

Using HAVING with Aggregations

The `HAVING` clause is used to filter records after aggregation. Unlike `WHERE`, which filters rows before aggregation, `HAVING` filters groups.

Example:

This query returns departments where the average salary is greater than 50,000.

```
SELECT department, AVG(salary)
FROM employees
GROUP BY department
HAVING AVG(salary) > 50000;
```

Key Takeaways

- Aggregation functions summarize data.
- `GROUP BY` organizes data into groups for aggregation.
- `HAVING` filters groups after aggregation.

Thank you

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