



Experiment No.5

Perform simple queries, string manipulation operations and aggregate functions.

Aim :- Write simple query to manipulate string operations and perform aggregate functions like (MIN, MAX, SUM, AVERAGE, COUNT).

Objective :- To apply aggregate functions and string manipulation functions to perform simple queries in the database system

Theory:

Simple Queries in SQL:

In SQL, a simple query is a request for data from a database table or tables. It allows users to retrieve specific information by specifying the columns they want to retrieve and any conditions for filtering rows based on certain criteria. Simple queries are the backbone of interacting with databases, enabling users to extract the data they need for analysis, reporting, or further processing.

String Manipulation Operations:

String manipulation operations in SQL involve modifying or transforming string values stored in database columns. These operations are crucial for tasks such as formatting data, combining strings, converting case, or extracting substrings. By using string functions and operators, users can manipulate text data to suit their requirements, whether it's for display purposes or for further analysis.

Aggregate Functions:

Aggregate functions in SQL are used to perform calculations on sets of values and return a single result. These functions allow users to summarize data across multiple rows, providing insights into the overall characteristics of the dataset. Common aggregate functions include calculating counts, sums, averages, minimums, and maximums of numerical values. They are essential tools for data analysis, enabling users to derive meaningful insights from large datasets.

Benefits of Understanding These Concepts:

- **Data Retrieval:** Simple queries allow users to fetch specific data from databases, facilitating data retrieval for various purposes.



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- **Data Transformation:** String manipulation operations enable users to format and transform text data according to their needs, improving data consistency and readability.
- **Data Analysis:** Aggregate functions help users summarize and analyze large datasets, providing valuable insights into trends, patterns, and statistical measures.
- **Data Reporting:** By combining simple queries, string manipulation operations, and aggregate functions, users can generate reports and visualizations that communicate key findings effectively.



Implementation:

MY SQL CODE:

```
CREATE TABLE documents (  
    document_id INT PRIMARY KEY,  
    document_name VARCHAR(255),  
    file_size BIGINT,  
    file_extension VARCHAR(10)  
);  
  
INSERT INTO documents (document_id, document_name, file_size, file_extension)  
VALUES  
    (1, 'Report', 1024000, 'pdf'),  
    (2, 'Proposal', 512000, 'docx'),  
    (3, 'Presentation', 768000, 'ppt');  
  
SELECT CONCAT(document_name, '.', file_extension) AS full_filename  
FROM documents;  
  
SELECT LOWER(document_name) AS lowercase_name  
FROM documents;  
  
SELECT SUM(file_size) AS total_file_size  
FROM documents;  
  
SELECT MAX(file_size) AS largest_file_size  
FROM documents;  
  
SELECT AVG(file_size) AS average_file_size  
FROM documents;  
  
SELECT COUNT(*) AS document_count  
FROM documents;
```



Output:

```
+-----+
| full_filename |
+-----+
| Report.pdf   |
| Proposal.docx|
| Presentation.ppt|
+-----+
+-----+
| lowercase_name|
+-----+
| report       |
| proposal     |
| presentation  |
+-----+
+-----+
| total_file_size|
+-----+
|           2304000|
+-----+
+-----+
| largest_file_size|
+-----+
|           1024000|
+-----+
+-----+
| average_file_size|
+-----+
|       768000.0000|
+-----+
+-----+
| document_count |
+-----+
|                3|
+-----+
```



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Conclusion:

1. Write syntax and explanation for each of the five aggregate functions

➔ Aggregate Functions:

- These functions operate on a set of values and return a single result. They are often used with the `SELECT` statement.

a. `AVG()` (Average):

- Calculates the average value of a numeric column.
- Syntax:
`SELECT AVG(column_name) FROM table_name;`
- Example:
`SELECT AVG(file_size) AS average_file_size FROM documents;`

b. `SUM()` (Summation):

- Computes the sum of all non-NULL values in a numeric column.
- Syntax:
`SELECT SUM(column_name) FROM table_name;`
- Example:
`SELECT SUM(file_size) AS total_file_size FROM documents;`

c. `MAX()` (Maximum):

- Returns the highest value (maximum) in a column.
- Syntax:
`SELECT MAX(column_name) FROM table_name;`
- Example:
`SELECT MAX(file_size) AS largest_file_size FROM documents;`

d. `MIN()` (Minimum):

- Retrieves the lowest value (minimum) in a column.
- Syntax:
`SELECT MIN(column_name) FROM table_name;`
- Example:
`SELECT MIN(file_size) AS smallest_file_size FROM documents;`

e. `COUNT()`:

- Counts the number of rows in a result set.
- Syntax:
`SELECT COUNT(*) FROM table_name;`
- Example:
`SELECT COUNT(*) AS document_count FROM documents;`



2. Show results of operations performed.

➔ **Results of Operations Performed:**

- Assuming the sample data from the previous example, here are the results:
 - Average file size: 768,000 bytes
 - Total file size: 2,304,000 bytes
 - Largest file size: 1,024,000 bytes
 - Smallest file size: 512,000 bytes
 - Number of documents: 3