Experiment No.5
Perform simple queries, string manipulation operations and aggregate functions.
Date of Performance:
Date of Submission:

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.
- 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:

```
136     -- Find the minimum fare
137 •   SELECT MIN(fares) AS min_fare FROM TrainInfo;
138
139     -- Find the maximum fare
140 •   SELECT MAX(fares) AS max_fare FROM TrainInfo;
141
142     -- Find the average fare
143 •   SELECT AVG(fares) AS avg_fare FROM TrainInfo;
144
145     -- Count the number of fares
146 •   SELECT COUNT(fares) AS num_fares FROM TrainInfo;
147
148     -- Sum of all fares
149 •   SELECT SUM(fares) AS total_fare FROM TrainInfo;
150
```

Conclusion:

1. Write syntax and explanation for each of the five aggregate functions
   1. COUNT():
      - Syntax: COUNT(expression)
      - Explanation: Calculates the number of rows that match a specified condition or expression.
   2. SUM():
      - Syntax: SUM(expression)
      - Explanation: Calculates the sum of values in a numeric column or result set, ignoring NULL values.
   3. AVG():
      - Syntax: AVG(expression)
      - Explanation: Calculates the average value of a numeric column or result set, ignoring NULL values.
   4. MIN():
      - Syntax: MIN(expression)
      - Explanation: Returns the minimum value from a set of values, ignoring NULL values.
   5. MAX():
      - Syntax: MAX(expression)
      - Explanation: Returns the maximum value from a set of values, ignoring NULL values.

   These functions are used for data analysis and summarization in SQL queries.