Exp.No: 3   AGGREGATION
Date   :

AIM:
   To write a Query the database tables using different 'where' clause conditions and also implement aggregate functions.

DESCRIPTION:

The SQL WHERE Clause

The WHERE clause is used to filter records. It is used to extract only those records that fulfill a specified condition.

Syntax

   SELECT column1, column2, … FROM table_name WHERE condition;

   The WHERE clause is not only used in SELECT statements, it is also used in UPDATE, DELETE, etc.!

Operators in The WHERE Clause

The following operators can be used in the WHERE clause:

Operator	Description	Example
=	Equal	SELECT * FROM Products WHERE Price = 18;
>	Greater than	SELECT * FROM Products WHERE Price > 30;
<	Less than	SELECT * FROM Products WHERE Price < 30;
>=	Greater than or equal	SELECT * FROM Products WHERE Price >= 30;
<=	Less than or equal	SELECT * FROM Products WHERE Price <= 30;
<>, !=	Not equal.	SELECT * FROM Products WHERE Price <> 18;
BETWEEN	Between a certain range	SELECT * FROM Products WHERE Price BETWEEN 50 AND 60;
LIKE	Search for a pattern	SELECT * FROM Customers WHERE City LIKE 's%';
IN	To specify multiple possible values for a column	SELECT * FROM Customers WHERE City IN ('Paris','London');

MySQL sum() function

The MySQL sum() function is used to return the total summed value of an expression. It returns NULL if the result set does not have any rows. It is one of the kinds of aggregate functions in MySQL.

Syntax :

SELECT SUM(aggregate_expression) FROM tables [WHERE conditions];

   Consider our database has a table named employees, having the following data. Now, we are going to understand this function with various examples:

- **MySQL sum() function with WHERE clause-** This example is used to return the result based on the condition specified in the WHERE clause.

- **MySQL sum() function with GROUP BY clause-** We can also use the SUM() function with the GROUP BY clause to return the total summed value for each group.

- **MySQL sum() function with HAVING clause-** The HAVING clause is used to filter the group with the sum() function in MySQL.

- **MySQL sum() function with DISTINCT clause-** MySQL uses the DISTINCT keyword to remove the duplicate rows from the column name. This clause can also be used with sum() function to return the total summed value of a Unique number of records present in the table.

Exercise:

1. Create a table which has the following fieldsCustomerID, CustomerName, ContactName, Address,City, PostalCode, Country.

CREATE TABLE CUSTOMER(CustomerID number, CustomerName varchar2(15), ContactName varchar2(15), Address varchar2(15), City varchar2(15), PostalCode number);

2.Write a SQL statement selects all the customers from the country "Mexico", in the "Customers" table:

   SELECT * FROM Customers WHERE Country='Mexico';

   SELECT * FROM Customers WHERE CustomerID=1;

3. Execute the following query that uses the COUNT(expression) function to calculates the total number of employees name available in the table:
   mysql> SELECT COUNT(emp_name) FROM employees;

4. Execute the following statement that returns all rows from the employee table and WHERE clause specifies the rows whose value in the column emp_age is greater than 32:
   mysql> SELECT COUNT(*) FROM employees WHERE emp_age>32;

5. This statement uses the COUNT(distinct expression) function that counts the Non-Null and distinct rows in the column emp_age:
   mysql> SELECT COUNT(DISTINCT emp_age) FROM employees;

MySQL Count() Function with GROUP BY Clause
6. We can also use the count() function with the GROUP BY clause that returns the count of the element in each group. For example, the following statement returns the number of employee in each city:
   mysql> SELECT emp_name, city, COUNT(*) FROM employees GROUP BY city;

MySQL Count() Function with HAVING and ORDER BY Clause
7. Execute the following statement that gives the employee name who has at least two age same and sorts them based on the count result
   mysql> SELECT emp_name, emp_age, COUNT(*) FROM employees GROUP BY emp_age HAVING COUNT(*)>=2 ORDER   BY COUNT(*);

8. Execute the following query that calculates the total number of working hours of all employees in the table:
   mysql> SELECT SUM(working_hours) AS "Total working hours" FROM employees;

9. Execute the following query to calculate the total working hours of employees whose working_hours >= 12.
   mysql> SELECT SUM(working_hours) AS "Total working hours" FROM employees WHERE working_hours>=12;

10. Write a statement calculates the total working hours of each employee by using the SUM() function with the GROUP BY clause, as shown in the following query:
   mysql> SELECT emp_id, emp_name, occupation, SUM(working_hours) AS "Total working hours" FROM employees GROUP   BY occupation;

11. Execute the following statement that calculates the working hours of all employees, grouping them based on their occupation and returns the result whose Total_working_hours>24.
   mysql> SELECT emp_id, emp_name, occupation, SUM(working_hours) Total_working_hours FROM employees GROUP BY   occupation HAVING SUM(working_hours)>24;

12. Execute the following query that removes the duplicate records in the working_hours column of the employee table and then calculates the sum:
   mysql> SELECT emp_name, occupation,2. SUM(DISTINCT working_hours) Total_working_hours FROM employees GROUP   BY occupation;

VIVA Questions

   1. What are aggregate functions in MySQL?

   2. Which clause is used with an aggregate functions?

3. How do you write aggregate function in SQL?

4. Why are aggregate functions called so?

5. Is sum an aggregate function in SQL?

6. What is the syntax of Count() function and sum() function ?

RESULT

Thus the database was created and the SQL queries are written to retrieve information from the database.