|  |  |
| --- | --- |
| **Name** | Adwait S Purao |
| **UID no.** | 2021300101 |
| **Experiment No.** | 5 |

|  |  |
| --- | --- |
| **AIM:** | To learn and apply aggregate functions |
| **Program 1** | |
| **PROBLEM STATEMENT :** | . Peform aggregate functions on database – Count() , Sum() , Avg() , min() ,max() |
| **Theory :** | **Aggregate functions**  An aggregate function performs a calculation on a set of values, and returns a single value. Except for COUNT(\*), aggregate functions ignore null values. Aggregate functions are often used with the GROUP BY clause of the SELECT statement.  All aggregate functions are deterministic. In other words, aggregate functions return the same value each time that they are called, when called with a specific set of input values. See Deterministic and Nondeterministic Functions for more information about function determinism. The OVER clause may follow all aggregate functions, except the STRING\_AGG, GROUPING or GROUPING\_ID functions.  Use aggregate functions as expressions only in the following situations:  The select list of a SELECT statement (either a subquery or an outer query).  A HAVING clause.  **COUNT() Function**  The COUNT() function returns the number of rows that matches a specified criterion.  **Syntax:**  SELECT COUNT(column\_name)  FROM table\_name  WHERE condition;  **AVG Syntax**  The AVG() function returns the average value of a numeric column.  **Syntax:**  SELECT AVG(column\_name)  FROM table\_name  WHERE condition;  **SUM Syntax**  The SUM() function returns the total sum of a numeric column.  **Syntax:**  SELECT SUM(column\_name)  FROM table\_name  WHERE condition;  **MIN Syntax**  The MIN() function returns the smallest value of the selected column.  **Syntax:**  SELECT MIN(column\_name)  FROM table\_name  WHERE condition;  **MAX Syntax**  The MAX() function returns the largest value of the selected column.  **Syntax:**  SELECT MAX(column\_name)  FROM table\_name  WHERE condition; |
| **Queries** | **Table Hotel\_info**  **1)Count function**  use hotel;  select count(h\_id)  from hotel\_info;  **Statement:**  Here count function counts the number of hotels with the help of h\_id(hotel id)  **Table**    **Output:**    **2)Avg function**  use hotel;  select avg(h\_vacancies)  from hotel\_info;  **Statement:**  Here the avg function calculates the average number of vacancies in all hotels  **Table**    **Output:**    **3)Sum function**  use hotel;  select sum(h\_num\_emp)  from hotel\_info;  **Statement:**  Here the sum function calculates the total number of employees in all hotels  **Table**    **Output**    **4)Min function**  use hotel;  select h\_num\_emp,h\_name,h\_id,h\_address  from hotel\_info where h\_num\_emp=(select min(h\_num\_emp) from hotel\_info) ;  **Statement:**  This function calculates the hotel with minimum number of employees  **Table**    **Output**    **5)Max function**  use hotel;  select r\_price,h\_id,r\_no,r\_type  from room where r\_price=(select max(r\_price) from room) ;  **Statement:**  This function tells the room with maximum price  **Table**    **Output**    **Table Room**  **1)Count function**  use hotel;  select count(r\_no)  from room;  **Statement:**  Here count function counts the number of rooms with the help of r\_no(room number)  **Table**    **Output**    **2)Avg function**  use hotel;  select avg(r\_price)  from room;  **Statement:**  Here the avg function calculates the average prices of rooms    **Output**    **3)Sum function**  use hotel;  select sum(r\_price) as room\_price  from room;  **Statement:**  Here the sum function calculates the total prices of all rooms  **Table**    **Output**    **4)Min function**  use hotel;  select r\_price,h\_id,r\_no,r\_type  from room where r\_price=(select min(r\_price) from room) ;  **Statement:**  This function calculates the room with minimum price  **Table**    **Output**    **5)Max function**  use hotel;  select r\_price,h\_id,r\_no,r\_type  from room where r\_price=(select max(r\_price) from room) ;  **Statement:**  This function tells the room with maximum price  **Table**    **Output:**    **Employee Table**  **1)Count Function**  use hotel;  select count(e\_salary) as Number\_of\_employees,e\_type  from employee group by e\_type having E\_type like 'Temporary';  **Statement:**  Here count function counts the number of temporary employees , here group by takes only temporary employees  **Table**    **Output**    **2)Avg function**  use hotel;  select avg(e\_salary) as Average\_salary,e\_type  from employee group by e\_type having E\_type like 'Permanent';  **Statement:**  Here the avg function calculates the average salaries of employees who are permanent  **Table**    **Output:**    **3)Sum function**  use hotel;  select sum(e\_salary) as Sum\_of\_salaries,e\_type  from employee group by e\_type having E\_type like 'Permanent';  **Statement:**  Here the sum function calculates the total salaries of permanent employees  **Table**    **Output**    **4)Min function**  use hotel;  select e\_salary,e\_name,e\_type  from employee where e\_salary=(select min(e\_salary) from employee) ;  **Statement:**  This function calculates the employee with minimum salary  **Table**    **Output**    **5)Max function**  use hotel;  select e\_salary,e\_name,e\_type  from employee where e\_salary=(select max(e\_salary) from employee) ;  **Statement:**  This function calculates the employee with the maximum salary  **Table**    **Output**    **Table Customer**  **1)Count function**  use hotel;  select count(c\_id)  from customer  **Statement:**  Here count function counts the number of customers with the help of c\_id(customer id)  **Table**    **Customer**    **2)Avg function**  use hotel;  select avg(c\_age)  from customer;  **Statement:**  Here the avg function calculates the average ages of all customers  **Table**    **Output**    **3)Sum function**  use hotel;  select sum(c\_age) As Sum\_Of\_Ages  from customer;  **Statement:**  Here the sum function calculates the sum of ages of all customers  **Table**    **Output**    **4)Min function**  use hotel;  select c\_cin\_time,c\_name,r\_no,Reservation\_no  from customer where c\_cin\_time=(select min(c\_cin\_time) from customer) ;  **Statement:**  This function tells the name of the customer who arrived the earliest  **Table**    **Output**    **5)Max function**  use hotel;  select c\_cin\_time,c\_name,r\_no,Reservation\_no  from customer where c\_cin\_time=(select max(c\_cin\_time) from customer) ;  **Statement:**  This function tells the name of the customer who arrived the earliest  **Table**    **Output**    **Reservation Table**  **1)Count function**  use hotel;  select count(reservation\_no) As Number\_Of\_Reservations  from reservation;  **Statement:**  Here count function counts the number of reservations with the help of r\_no (reservation no.)  **Table**    **Output**    **2)Avg function**  use hotel;  select avg(Amount) As Average\_price\_of\_room  from reservation;  **Statement:**  Here the avg function calculates the average prices of rooms  **Table**    **Output**    **3)Sum function**  use hotel;  select sum(Amount) As Total\_price  from reservation;  **Statement:**  Here the sum function calculates the total price of all rooms  **Table**    **Output**    **4)Min function**  use hotel;  select R\_outtime as Earliest\_Customer,c\_id,r\_no,Reservation\_no  from reservation where R\_outtime=(select min(R\_outtime) from reservation) ;  **Statement:**  This function tells the name of the customer who arrived the earliest  **Table**    **Output**    **5)Max function**  use hotel;  select R\_outtime as Latest\_Customer,c\_id,r\_no,Reservation\_no  from reservation where R\_outtime=(select max(R\_outtime) from reservation) ;  **Statement:**  This function tells the name of the customer who was latest  **Table**    **Output** |
| **Conclusion:**  **We learned about various types of aggregate functions in SQL . We learned about Sum function, Count function , Avg function , Min function and Max function in this experiment. Aggregate functions help us perform mathematical computations on columns in a relational database . We learnt about the having clause . Hence this experiment gave us a deeper understanding of aggregate functions.** | |