Indian Institute of Information Technology Sri City
Database Management Systems LAB-04
TOPIC : Aggregate functions, Grouping, String and Numeric functions

AGGREGATE FUNCTIONS: MySQL supports the following aggregate functions.

Aggregate function	Description
AVG()	Return the average of non-NULL values.
COUNT()	Return the number of rows in a group, including rows with NULL values.
MAX()	Return the highest value (maximum) in a set of non-NULL values.
MIN()	Return the lowest value (minimum) in a set of non-NULL values.
STDEV()	Return the population standard deviation.
SUM()	Return the summation of all non-NULL values in a set.
VARIANCE()	Return the population standard variance. SELECT VARIANCE(income) FROM employee;

GROUPING: The GROUP BY clause is a SQL command that is used to group rows that have the same values.

- The GROUP BY clause is used in the SELECT statement.
- Optionally it is used in conjunction with aggregate functions to produce summary reports from the database.

ORDER BY CLAUSE:

Use the ORDER BY clause to display the output table of a query in either ascending or descending alphabetical order. Whereas the GROUP BY clause gathers rows into groups and sorts the groups into alphabetical order, ORDER BY sorts individual rows.

General syntax for using **GROUP Functions:**

SELECT <column, ..>, group_function(column)
FROM <table>

WHERE <condition>
 [GROUP BY <column>]
 [ORDER BY <column>];
Example 1: Maximum salary from employee table

 SELECT emp_dept, MAX(income)
FROM employee;

Example 2: All columns in the SELECT list that are not in the group functions must be in the
GROUP BY clause.

<u>Illegal</u>

 SELECT emp_dept, job, MAX(income)
FROM employee
GROUP BY emp_dept;

<u>Legal</u>

 SELECT emp_dept, job, MAX(income)
FROM employee
GROUP BY emp_dept, job;

HAVING clause: We cannot use the WHERE clause to restrict groups.

<u>Illegal</u>
 SELECT emp_dept, MAX(income)
FROM employee
WHERE MAX(income) >2000
GROUP BY emp_dept;

<u>Legal</u>
 SELECT emp_dept, MAX(income)
FROM employee
GROUP BY emp_dept
HAVING MAX(income) >2000;

EXERCISES

Exercise 1:

#Create table employee with the following constraints;
CREATE TABLE employee(emp_id, emp_name ,emp_dept emp_age, place, income);
Set emp_id as the primary key with auto increment starting from 2505.

 # insert the below given records into the table employee table

Load "*employee.csv*"(using the mysql workbench, easy) data into the employee table.

CREATE TABLE employee(emp_id int, emp_name varchar(20), emp_dept varchar(20), emp_age int, place varchar(20), income int, doj date);

ALTER TABLE employee auto_increment=2505;

emp_id	emp_name	emp_dept	emp_age	place	income	doj
2505	peter	Finance	32	Newyork	100000	2002-08-25
2506	Mark	HR	32	California	120000	1980-03-25
2507	Donald	Finance	28	Arizona	100000	1995-12-26
2508	Obama	Management	35	Florida	500000	1990-10-30
2509	Linklon	HR	25	Georgia	25000	2008-08-08
2510	Kane	Sales	29	Alaska	30000	2000-01-01
2511	Adam	Management	38	California	54000	2020-10-25
2512	Mac	Finance	40	Florida	280000	1970-06-09
2513	Manas	Accounts	29	India	600000	1990-12-11
2514	Vasin	Accounts	30	India	800000	1989-10-10
2515	peter	Finance	32	Newyork	100000	1989-10-10
2516	Mark	HR	32	California	120000	1990-12-11
2517	Donald	Finance	28	Arizona	100000	1970-06-09
2518	Obama	Management	35	Florida	500000	2020-10-25
2519	Linklon	HR	25	Georgia	25000	2000-01-01
2520	Kane	Sales	29	Alaska	30000	2008-08-08
2521	Adam	Management	38	California	54000	1990-10-30
2522	Mac	Finance	40	Florida	280000	1995-12-26

Questionnaire set:

1. Calculate the total number of employees name available in the table
2. Display the maximum salary of each department and also all departments put together
3. Find the employees whose salary is between 100000 and 500000 but not exactly 120000.
4. Get the count of employees whose income is more than 1 lakh.
5. List the employees according to ascending order of salary
6. For each department, retrieve the department name, the number of employees in the department, and Maximum income for the department.
7. List the number of employees in each place.
8. List the number of employee in each country sorted high to low
9. List the number of employees in each place. (Only include places with more than 1 employee)
10. List the number of employees in each place, except the California, sorted high to low. Only include places with 2 or more employees

Tables for Exercise2

1. Create table customer (customer_name char(20),customer_street char(30),customer_city char(30),PRIMARY KEY(customer_name));
2. Create table branch (branch_name char(15),branch_city char(30),assets numeric(16,2),PRIMARY KEY(branch_name));
3. Create table account (account_number char(15),branch_name char (15),balance numeric(12,2),PRIMARY KEY(account_number),FOREIGN KEY (branch_name) REFERENCES branch(branch_name));
4. Create table depositor(customer_name char(20),account_number char(10),PRIMARY KEY(customer_name,account_number),FOREIGN KEY (customer_name) REFERENCES customer(customer_name),FOREIGN KEY (account_number) REFERENCES account(account_number));
5. Create table loan(loan_number varchar(6),branch_name char(15),amount int,PRIMARY KEY(loan_number),FOREIGN KEY (branch_name) REFERENCES branch(branch_name));
6. Create table borrower(customer_name char(20),loan_number varchar(6),PRIMARY KEY(customer_name,loan_number),FOREIGN KEY (customer_name) REFERENCES customer(customer_name),FOREIGN KEY (loan_number) REFERENCES loan(loan_number));

Questionnaire set:

1. Create the tables for above schema and load data from the respective .csv files

2. For all customers who have loan from the bank,find their names,loan numbers and loan amount(with and without renaming tables)
3. Find the customer names,loan numbers and loan amounts for all loans at perryridge branch.
4. Find the names of all branches that have assets greater than at least one branch located at Brooklyn.
5. List in alphabetical order all customers who have loans at the perryridge branch.
6. Print the entire Loan relation in descending order of amount.If several loans have the same amount,order them in ascending order by loan number.
7. Find the average balance for all accounts.
8. Find no.of tuples in customer relation.
9. Find the total of all loan amounts.
10. Find the average account balance at the Perryridge branch.
11. Find the average account balance at each branch.
12. Find the average account balance at each branch, where the account balance is more than 1200.
13. Find the number of depositors for each branch.
14. Find the average balance for each customer who lives in ''Harrison" and has at least 3 accounts