Experiment No 15: Execute queries for Ordering and Grouping data.

I. Practical Significance:

This practical will help students to understand different clauses used in SQL. The clauses are used to retrieve the information from the table. SQL clause helps us to retrieve a set or bundles of records from the table. SQL clause helps us to specify a condition on the columns or the records of a table. Different clauses available in the Structured Query Language are as follows: WHERE CLAUSE, GROUP BY CLAUSE, HAVING CLAUSE, ORDER BY CLAUSE.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME:

To execute queries using different clauses to perform advance calculations.

III. COURSE LEVEL LEARNING OUTCOMES (COS):

CO3 - Manage database using SQL.

IV. LABORATORY LEARNING OUTCOME:

Execute queries using different clauses.

V. Relevant Affective Domain related outcome(s)

a. Follow precautionary measures.

b. Follow installation steps.

c. Follow ethical practices.

VI. Relevant Theoretical Background

Clauses	Explanation	Syntax
WHERE	The WHERE clause is used to filter records. It is used to extract only those records that fulfill a specified condition.	SELECT column1, column2, ... FROM table_name WHERE condition;

HAVING	The HAVING clause was added to SQL because the WHERE keyword cannot be used with aggregate functions.	SELECT column_name(s) FROM table_name WHERE condition GROUP BY column_name(s) HAVING condition ORDER BY column_name(s);
GROUP BY	The GROUP BY statement groups rows that have the same values into summary rows. The GROUP BY statement is often used with aggregate functions (COUNT(), MAX(), MIN(), SUM(), AVG()) to group the result-set by one or more columns.	SELECT column_name(s) FROM table_name WHERE condition GROUP BY column_name(s) ORDER BY column_name(s);
ORDER BY	The ORDER BY keyword is used to sort the result-set in ascending or descending order.	SELECT column1, column2, ... FROM table_name ORDER BY column1, column2, ... ASC|DESC;

VII. Required Resources/apparatus/equipment with specifications

Sr. No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Computer system with all necessary components like; motherboard, random access memory (RAM), read-only memory (ROM), internal hard disk drives, Mouse, Keyboard, and RDBMS applications such as Oracle Express Edition, MySQL, SQLite, Oracle Live SQL etc.	All

VIII. Procedure

Execute SQL queries using different WHERE, HAVING, GROUPBY, ORDER BY clause.

* Practical related questions.

Create Two tables Emp & Dept.

Create table Emp (Emp_no Int(10) primary key, Ename Varchar (50), Dept_no Int(10), Dept_name Varchar(50), Name Varchar (50), Job_id Int, Salary Decimal (10,2) Foreign key (Dept_no));

Create table Dept (Dept_no int Primary key, Emp_no int, Dept_name Varchar (50), location Varchar(50), foreign key (Emp_no));

1] Display the information of the tables using SELECT Command.

→ SELECT * from Emp;

SELECT * From Dept;

2] Execute the SQL queries using SELECT, Where, Group by clause.

→ SELECT E-name, Salary From Emp Where Dept_no = 101;

SELECT Job_id, Avg(Salary) as Avg_Salary from Emp Group by Job_id;

3] Execute the SQL queries using SELECT, where, Group by and Having clause.

→ SELECT Job_id, Avg(Salary) as Avg_Salary from emp Group by Job_id Having Avg(salary) > 50000;

4] Execute the SQL queries using SELECT, where order by clause.

→ SELECT E_name, Salary from Emp where Salary > 10,0000 order by Salary DESC;

5] Write the advantages of using the order by clause.

→ (i) Sorting Data:

The ORDER By clause allows you to sort the result set of a query by one or more columns, either in ascending (ASC) or descending (DESC) order. this is useful for organizing data in a meaningful way such as showing the highest salaries first.

(ii) improved Readability:

ordered data is easier to read & analyze especially when dealing with large datasets.

* Exercise

Q] →→→

Emp table

Emp_no	E_name	Dept_no	Dept_name	Job_id	Salary
1	Vaishnavi	101	HR	10001	40,000
2	Raj	102	IT	10002	45,000
3	Keyur	103	HR	10003	38000
4	Nayan	104	IT	10004	40,000
5	Sonakshi	105	HR	10005	50,000
6	Gayatri	106	HR	10006	46,000

a] Display minimum salary of employee from every department.

→ SELECT Dept_no, min(salary) as min_salary from emp Group by Dept_no

output :

Dept_no	min_salary
103	38,000

b] Display total salary of every department.

→ SELECT Dept_name, Sum(salary) as Total_salary from emp Group by Dept_name;

output :

Dept_name	Total_salary
HR	1,74,000
IT	85,000

C] Display Department having total emp more than 5

→ SELECT Dept_no, Count(Emp_no) As Total_emp from emp Group by Dept_no Having Count(Emp_no) > 5.

Output:

Dept_no	Total_emp
106	6

D] →

→ SELECT * From emp order by E_name ASC;

Emp_no	E_name	Dept_no	Dept_nam	Job_id	Salary
6	Gayatri	106	HR	10006	460000
3	Keyur	103	HR	10003	380000
4	Nayan	104	IT	10004	40,000
2	Raj	102	IT	10002	45000
5	Sonakshi Vaishnavi	105	HR	10005	50000
1	Vaishnavi	101	HR	10001	40000

IX. Result(s)

In this Practical we execute queries for ordering & Grouping data.

X. Practical related questions (Provide space for answers)

Note: Below are a few sample questions for reference. Teacher must design more suchquestions so as to ensure the achievement of identified CO.

Create Two Tables Emp and Dept, Consider the following schema

Emp (Emp_no as primary key, E_name, Dept_no, Dept_name, name, Job_id, Salary) and Dept (Dept_no as primary key, emp_no foreign key, deptname, location)

1. Display the information of the tables using SELECT command.
2. Execute the SQL queries using SELECT, WHERE, GROUP BY clause.
3. Execute the SQL queries using SELECT, WHERE, GROUP BY and HAVING clause.
4. Execute the SQL queries using SELECT, WHERE, ORDER BY clause.
5. Write the advantages of using the Order By clause.

(Space for answer)

E] →

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SELECT Dept_name, Dept_no, min(Emp_no)
AS Emp_no from dept Group by Dept_name,
Dept_no;
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Output:

Dept_name	Dept_no	Emp_no
HR	101	1
IT	102	2

XI. Exercise:

1. Write output of the following queries.
a. Display minimum salary of employee from every department;
b. Display total salary of every department.
c. Display the department having total employees more than 5.
d. Display details of employees with employee name in ascending order.
a. Display emp_no, dept_no from dept Group By deptname.

XII. References/Suggestions for further reading: include websites/links

1. https://www.oreilly.com/library/view/oracle-plsql-programming/0596003811/ch09s03.html
2. https://beginner-sql-tutorial.com/oracle-functions.htm