Experiment 2

Student Name: Sumanyu Seth **UID: 25MCI10040**
Branch: MCA (AI & ML) **Section/Group: 25MAM_KAR-1_A**
Semester: II **Date of Performance: 20/01/26**
Subject Name: Technical Training **Subject Code: 25CAP-652**

Title

Implementation of SELECT Queries with Filtering, Grouping and Sorting in PostgreSQL

Aim

To implement and analyze SQL SELECT queries using filtering, sorting, grouping, and aggregation concepts in PostgreSQL for efficient data retrieval and analytical reporting.

Objectives

- To retrieve specific data using filtering conditions
- To sort query results using single and multiple attributes
- To perform aggregation using grouping techniques
- To apply conditions on aggregated data
- To understand real-world analytical queries commonly asked in placement interviews

Practical:

Step 1: Database and Table Preparation

```
create table orders (
   order_id serial primary key,
   customer_name varchar(50),
   product varchar(50),
   quantity int,
   price numeric(10,2),
   order_date date
);
insert into orders (customer_name, product, quantity, price, order_date) values
('amit', 'laptop', 1, 65000, '2024-01-10'),
('neha', 'mobile', 2, 40000, '2024-01-12'),
('rohan', 'tablet', 1, 25000, '2024-01-15'),
('simran', 'laptop', 1, 70000, '2024-01-18'),
('ankit', 'mobile', 3, 60000, '2024-01-20'),
('pooja', 'headphones', 2, 5000, '2024-01-22'),
('rahul', 'tablet', 2, 48000, '2024-01-25');
```

Step 2: Filtering Data Using Conditions

```
select * from orders where price > 50000;
```

	order_id [PK] integer	customer_name character varying (50)	product character varying (50)	quantity integer	price numeric (10,2)	order_date date
1	1	amit	laptop	1	65000.00	2024-01-10
2	4	simran	laptop	1	70000.00	2024-01-18
3	5	ankit	mobile	3	60000.00	2024-01-20

select customer_name, product, price from orders where price > 30000 and quantity >= 2;

	customer_name character varying (50)	product character varying (50)	price numeric (10,2)
1	neha	mobile	40000.00
2	ankit	mobile	60000.00
3	rahul	tablet	48000.00

Step 3: Sorting Query Results

select customer_name, product, price from orders order by price asc;

	customer_name character varying (50)	product character varying (50)	price numeric (10,2)
1	pooja	headphones	5000.00
2	rohan	tablet	25000.00
3	neha	mobile	40000.00
4	rahul	tablet	48000.00
5	ankit	mobile	60000.00
6	amit	laptop	65000.00
7	simran	laptop	70000.00

select customer_name, product, price from orders order by price desc;

	customer_name character varying (50)	product character varying (50)	price numeric (10,2)
1	simran	laptop	70000.00
2	amit	laptop	65000.00
3	ankit	mobile	60000.00
4	rahul	tablet	48000.00
5	neha	mobile	40000.00
6	rohan	tablet	25000.00
7	pooja	headphones	5000.00

select customer_name, product, price, quantity from orders order by product asc, price desc;

	customer_name character varying (50)	product character varying (50)	price numeric (10,2)	quantity integer
1	pooja	headphones	5000.00	2
2	simran	laptop	70000.00	1
3	amit	laptop	65000.00	1
4	ankit	mobile	60000.00	3
5	neha	mobile	40000.00	2
6	rahul	tablet	48000.00	2
7	rohan	tablet	25000.00	1

Step 4: Grouping Data for Aggregation

select product, sum(price) as total_sales from orders group by product;

	product character varying (50)	total_sales numeric
1	headphones	5000.00
2	laptop	135000.00
3	tablet	73000.00
4	mobile	100000.00

select product, sum(quantity) as total_quantity from orders group by product;

	product character varying (50)	total_quantity bigint
1	headphones	2
2	laptop	2
3	tablet	3
4	mobile	5

Step 5: Applying Conditions on Aggregated Data

select product, sum(price) as total_sales from orders group by product having sum(price) > 50000;

	product character varying (50)	total_sales numeric
1	laptop	135000.00
2	tablet	73000.00
3	mobile	100000.00

Step 6: Conceptual Understanding of Filtering vs Aggregation Conditions

select product, sum(price) from orders where sum(price) > 50000 group by product;

```
ERROR:  aggregate functions are not allowed in WHERE
LINE 1: select product, sum(price) from orders where sum(price) > 50...
```

select product, sum(price) from orders group by product having sum(price) > 50000;

	product character varying (50)	sum numeric
1	laptop	135000.00
2	tablet	73000.00
3	mobile	100000.00

Learning Outcomes

● Understand how conditional filtering is used to retrieve only relevant records from a database.
● Explain how sorting enhances the readability and usefulness of query results in reports.
● Apply grouping techniques to organize data for analytical and summary purposes.
● Distinguish clearly between row-level conditions and group-level conditions using appropriate sql clauses.
● Develop confidence in writing analytical sql queries applicable to real-world database scenarios.
● Demonstrate improved readiness for placement and interview questions related to filtering, grouping, and aggregation concepts.