Experiment 2

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Subject Name: Technical training   **Subject Code: 25CAP-652**

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

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1. AIM:

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

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2. 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

3. SOFTWARE REQUIREMENTS:

To perform this experiment, the following software is required:

1. **Operating System**
   - Windows 10 / 11, Linux, or macOS
2. **Database Management System (DBMS)**
   - PostgreSQL (version 12 or higher)
3. **SQL Client / Interface**
   - pgAdmin 4 (for PostgreSQL)
     OR
   - Command Line Interface (psql)

4. PROCEDURE OF EXPERIMENT:

STEP 1: Database and Table Preparation

```
create table customer_orders(

id serial primary key,

customer_name varchar(20),

product varchar(20),

quantity int,

price numeric(10,2),

order_date date

);
```

id [PK] integer	customer_name character varying (20)	product character varying (20)	quantity integer	price numeric (10,2)	order_date date
1	Aradhya	Laptop	2	64000.00	2026-01-03
2	Rohan	Speaker	1	32000.00	2026-01-07
3	Raj	Headset	10	2000.00	2026-01-10
4	Hanna	Laptop	5	80000.00	2026-01-12
5	Harry	Keyboard	3	15000.00	2026-01-15
6	Mary	Mobile	1	28000.00	2026-01-15
7	Chandra	Charger	3	1500.00	2026-01-23

Created a realistic dataset with 10 records suitable for analytical queries.

STEP 2: Filtering Data Using Conditions

select id, customer_name, product, quantity, price

from customer_orders

where price > 30000;

id [PK] integer	customer_name character varying (20)	product character varying (20)	quantity integer	price numeric (10,2)
1	Aradhya	Laptop	2	64000.00
2	Rohan	Speaker	1	32000.00
4	Hanna	Laptop	5	80000.00

STEP 3: Sorting Query Results

-- Sorting Query Results (Ascending Order)

select id, customer_name, product, quantity, price

from customer_orders

where price > 30000

order by price;

	id [PK] integer	customer_name character varying (20)	product character varying (20)	quantity integer	price numeric (10,2)
1	2	Rohan	Speaker	1	32000.00
2	1	Aradhya	Laptop	2	64000.00
3	4	Hanna	Laptop	5	80000.00

-- Sorting Query Results (Decending Order)

select id, customer_name, product, quantity, price

from customer_orders

where price > 30000

order by price desc;

	id [PK] integer	customer_name character varying (20)	product character varying (20)	quantity integer	price numeric (10,2)
1	4	Hanna	Laptop	5	80000.00
2	1	Aradhya	Laptop	2	64000.00
3	2	Rohan	Speaker	1	32000.00

STEP 4: Grouping Data for Aggregation

select product, count(*) as total_sales

from customer_orders

group by product;

	product character varying (20)	total_sales bigint
1	Charger	1
2	Mobile	1
3	Speaker	1
4	Keyboard	1
5	Laptop	2
6	Headset	1

STEP 5: Applying Conditions on Aggregated Data

select product, sum(quantity * price) as total_revenue

from customer_orders

group by product

having sum(quantity * price) > 60000;

	product character varying (20)	total_revenue numeric
1	Laptop	528000.00

STEP 6: Conceptual Understanding – Filtering VS Aggregation

select product, sum(quantity * price) as total_revenue

from customer_orders

where order_date >= '2026-01-01'

group by product

having sum(quantity * price) > 60000;

	product character varying (20) 🔒	total_revenue 🔒 numeric
1	Laptop	528000.00

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5. LEARNING OUTCOMES

- **Filtering Skills:** Learned to retrieve relevant records using the WHERE clause with various conditions.
- **Sorting Techniques:** Understood ordering results using ORDER BY with single and multiple columns.
- **Grouping & Aggregation:** Gained proficiency in summarizing data using GROUP BY with aggregate functions such as SUM, AVG, and COUNT.
- **Conditional Aggregation:** Clearly differentiated between WHERE (row-level filtering) and HAVING (group-level filtering).
- **Real-World Application:** Built confidence in writing analytical SQL queries used in dashboards and business reports.
- **Interview Readiness:** Prepared for SQL placement questions on filtering, grouping, aggregation, and analytical functions.