TASK 6: SALES TREND ANALYSIS USING AGGREGATIONS

1. OBJECTIVE

The goal of this project is to analyze **monthly revenue** and **order volume** from the given orders.csv dataset.

- **Revenue** is calculated as:

$$Revenue = (List\ Price * Quantity) * (1 - \frac{Discount\ Percent}{100})$$

- **Order Volume** is calculated as the **number of unique orders per month**.

We use **PostgreSQL** to implement queries that summarize this information.

2. DATA PREPARATION

2.1 Create Table

We created a table called orders to store the dataset.
Column names were kept in quotes because the dataset contained **spaces and capital letters**.

```
CREATE TABLE orders (
    "Order Id" INT,
    "Order Date" DATE,
    "Ship Mode" VARCHAR(50),
    "Segment" VARCHAR(50),
    "Country" VARCHAR(100),
    "City" VARCHAR(100),
    "State" VARCHAR(100),
    "Postal Code" INT,
    "Region" VARCHAR(50),
    "Category" VARCHAR(50),
    "Sub Category" VARCHAR(50),
    "Product Id" VARCHAR(50),
    "cost price" INT,
```

```
    "List Price" INT,
    "Quantity" INT,
    "Discount Percent" INT
);
```

Explanation:

- The table schema matches the dataset structure.
- "Order Date" is stored as DATE for easier filtering.
- "List Price", "Quantity", and "Discount Percent" are numeric because we need them in calculations.

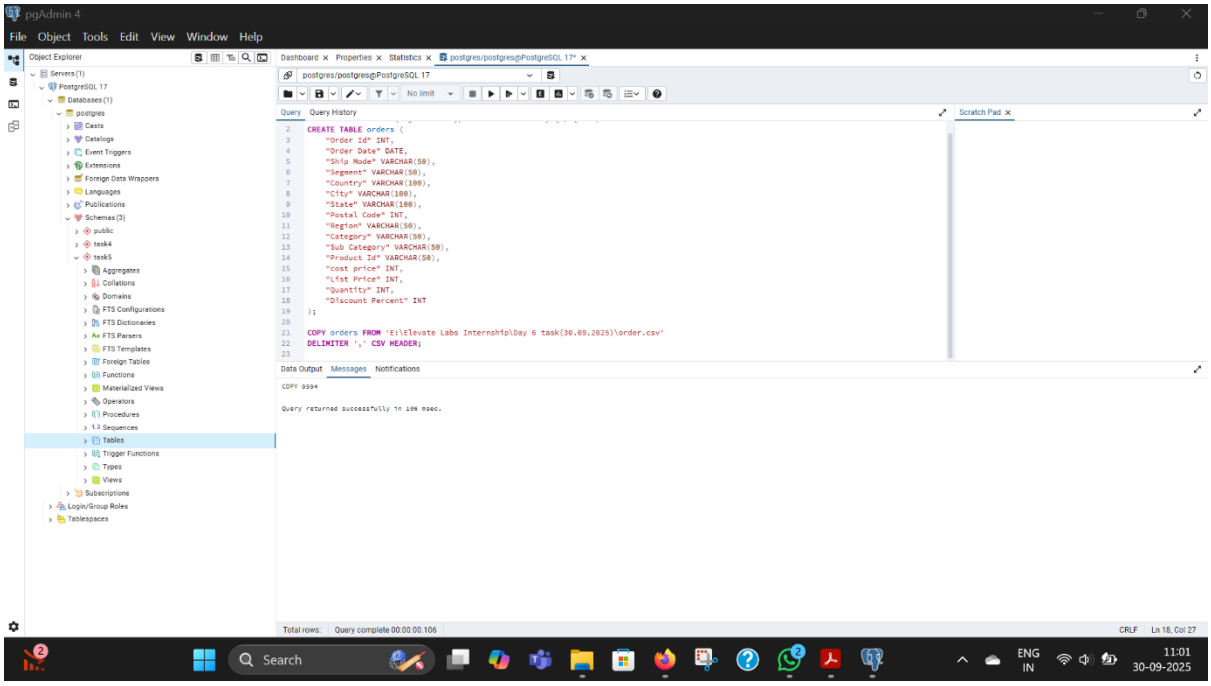
2.2 Load Data

- Depending on the database, different commands are used:

```
COPY orders FROM '/path/to/orders.csv' DELIMITER ',' CSV HEADER;
```

Explanation:

- These commands load the CSV into the table.
- IGNORE 1 ROWS / CSV HEADER skips the column headers.



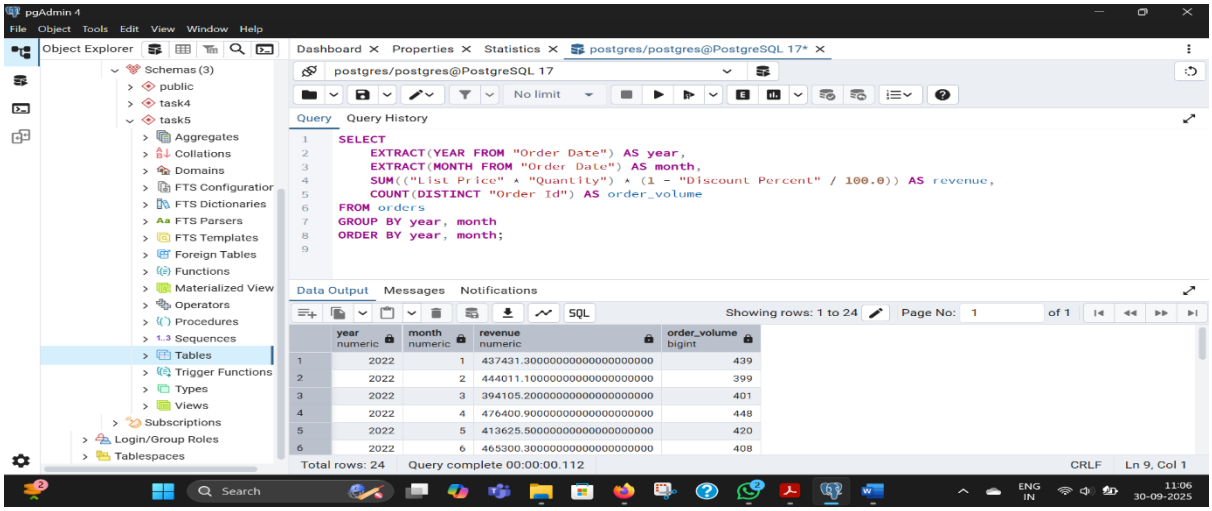
3.QUERYING THE DATA

3.1 Calculate Monthly Revenue & Order Volume

```
SELECT
   EXTRACT(YEAR FROM "Order Date") AS year,
   EXTRACT(MONTH FROM "Order Date") AS month,
   SUM(("List Price" * "Quantity") * (1 - "Discount Percent" / 100.0)) AS
revenue,
COUNT(DISTINCT "Order Id") AS order_volume
FROM orders
GROUP BY year, month
ORDER BY year, month;
```

Explanation:

- EXTRACT(YEAR FROM "Order Date") and EXTRACT(MONTH FROM "Order Date") split the date into year & month.
- SUM(("List Price" * "Quantity") * (1 - "Discount Percent" / 100.0)) calculates the monthly revenue after applying discounts.
- COUNT(DISTINCT "Order Id") counts the number of unique orders per month.
- GROUP BY year, month aggregates results month by month.
- ORDER BY year, month sorts results chronologically.

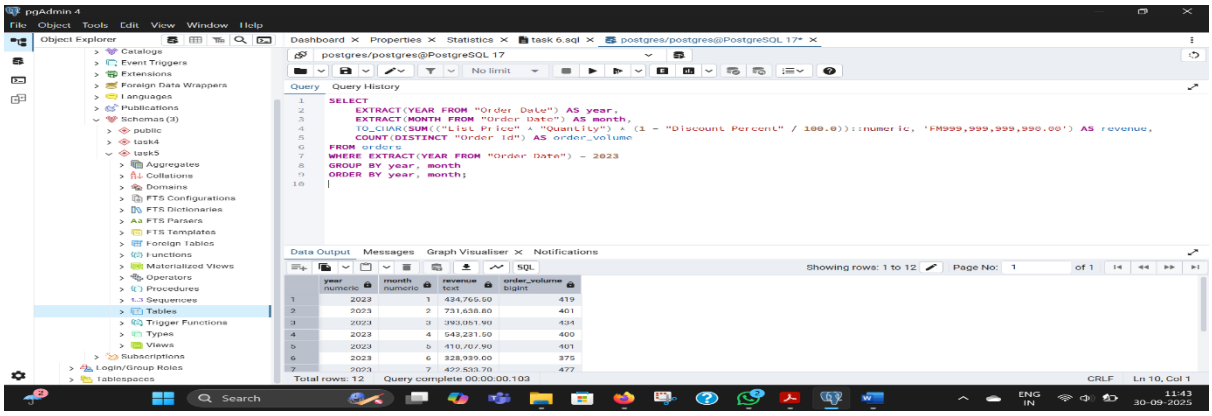


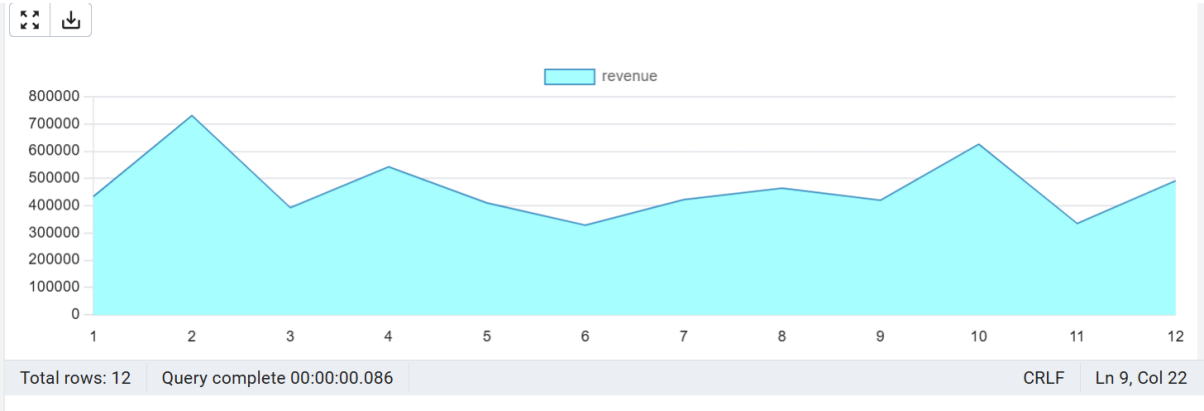
3.2 Limit to a Specific Time Period (Example: Year 2023)

```
SELECT
   EXTRACT(YEAR FROM "Order Date") AS year,
   EXTRACT(MONTH FROM "Order Date") AS month,
   SUM(("List Price" * "Quantity") * (1 - "Discount Percent" / 100.0)) AS
revenue,
   COUNT(DISTINCT "Order Id") AS order_volume
FROM orders
WHERE EXTRACT(YEAR FROM "Order Date") = 2023
GROUP BY year, month
ORDER BY year, month;
```

Explanation:

- The WHERE clause limits results to **2023 only**.
- This allows us to analyze a specific period rather than the full dataset.





4. RESULTS (ILLUSTRATION)

Running the above queries will give a table like:

"year"	"month"	"revenue"	"order_volume"
2023	1	"434,765.50"	419
2023	2	"731,638.80"	401
2023	3	"393,051.90"	434
2023	4	"543,231.50"	400
2023	5	"410,707.90"	401
2023	6	"328,939.00"	375
2023	7	"422,533.70"	477
2023	8	"465,010.30"	420
2023	9	"420,620.50"	353
2023	10	"626,498.30"	418
2023	11	"334,940.60"	413
2023	12	"491,848.90"	446