E-Commerce Sales Analytics

Overview

This project analyzes mock e-commerce sales data using SQL and Power BI. The goal is to uncover business insights such as revenue trends, customer behavior, and product performance.

The project was implemented using:

- **MySQL Workbench** for data storage and SQL querying
- **Power BI Desktop** for data visualization
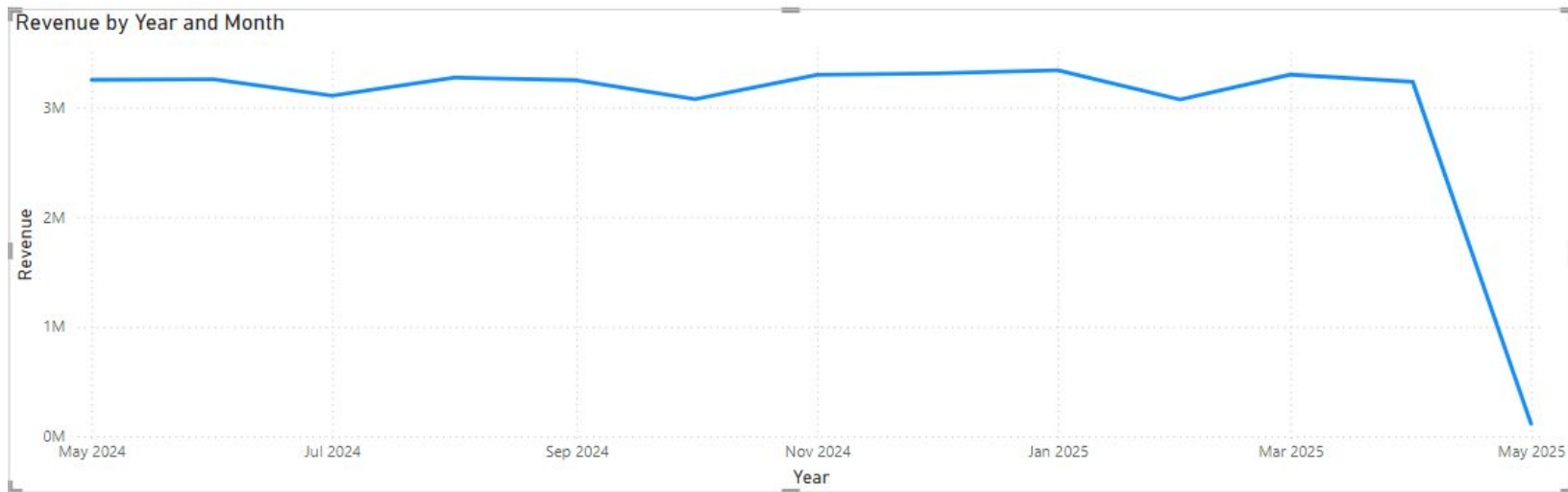
📈 Business Questions & Insights

Each question below includes:

- A description of the insight
- The Power BI visual used
- The equivalent SQL query

How is Revenue Trending over Time ?

Insight: Monthly Revenue trend helps understand sales performance.

PowerBI:

How is Revenue Trending over Time ?

**Insight:** Monthly Revenue trend helps understand sales performance.

SQL:

```sql
SELECT DATE_FORMAT(o.order_date, '%Y-%m') AS

SUM(oi.price * oi.quantity) AS total_revenue

FROM orders o

JOIN order_items oi ON o.order_id = oi.order_
```
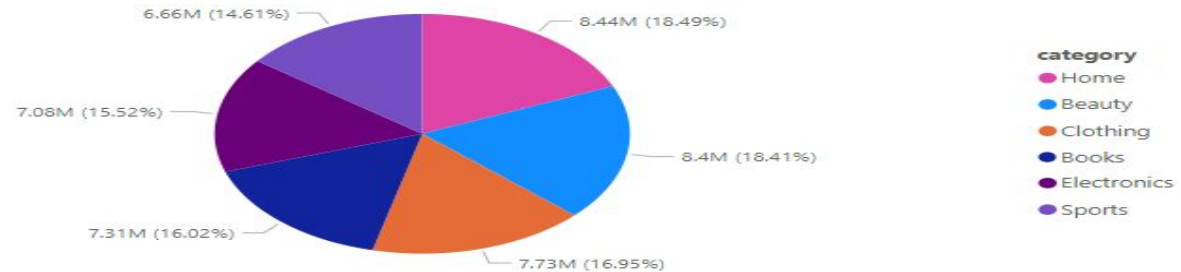
month	total_revenue
2024-05	3821660.30
2024-06	3759711.30
2024-07	3669923.97
2024-08	3927330.51
2024-09	3826590.43
2024-10	3655926.78
2024-11	3843946.99
2024-12	3840866.52
2025-01	3970761.07
2025-02	3572757.34
2025-03	3892668.14
2025-04	3699870.07
2025-05	127001.29

Which Categories Generate the Most Revenue ?

PowerBI:
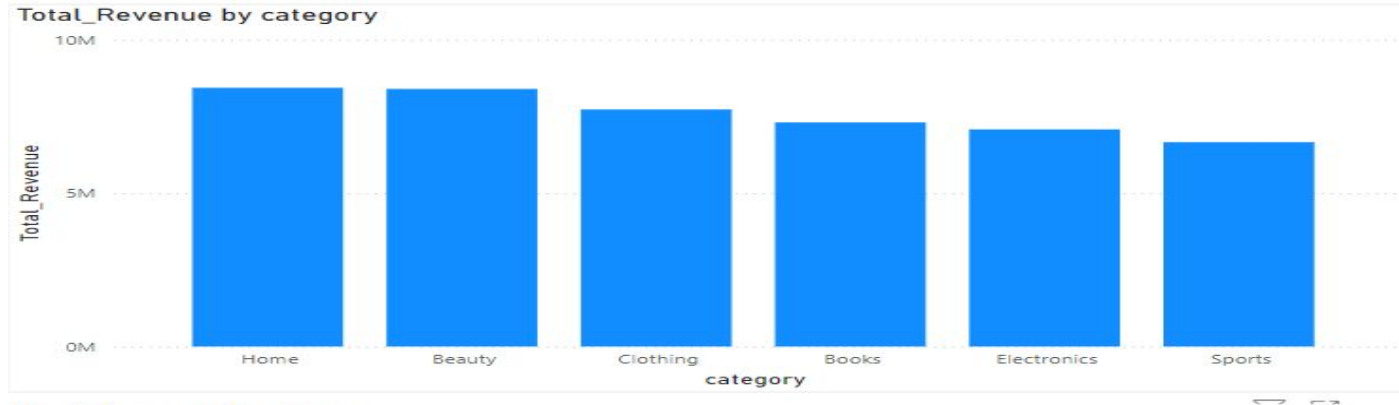
Total_Revenue by category

Which Categories Generate the Most Revenue ?

SQL:

```sql
SELECT p.category, SUM(oi.price * oi.quantity) AS total_revenue
FROM order_items oi
JOIN products p ON oi.product_id = p.product_id
GROUP BY p.category
ORDER BY total_revenue DESC;
```

category	total_revenue
Home	8435051.78
Beauty	8397874.18
Clothing	7729222.19
Books	7306663.54
Electronics	7078760.42
Sports	6661442.60

What is the Revenue distribution by Payment Method?

PowerBI:
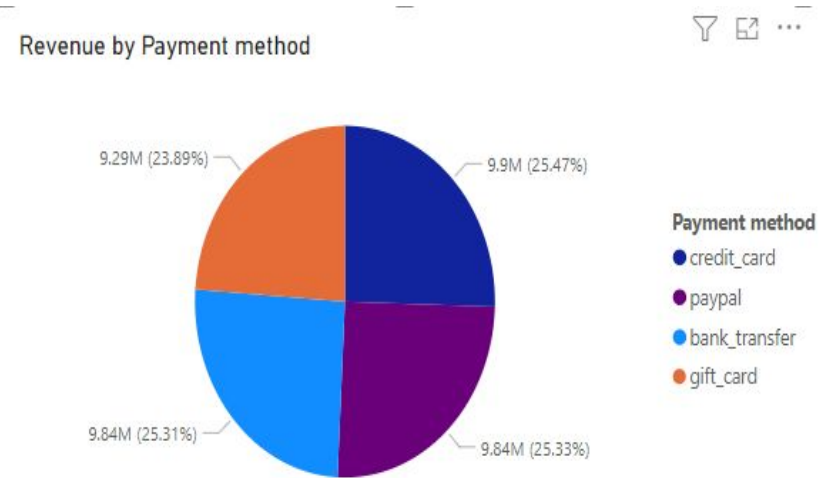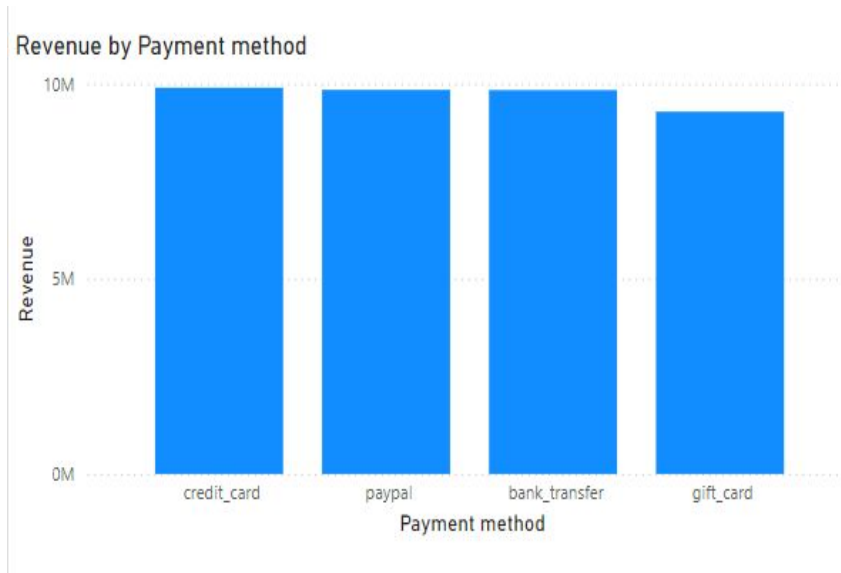
# What is the Revenue distribution by Payment Method?

SQL:

```sql
SELECT method as Payment_Method,
 SUM(amount) AS Total_Revenue
 FROM payments
GROUP BY method
ORDER BY Total_Revenue desc;
```

Payment_Method	Total_Revenue
credit_card	9898244.25
paypal	9843820.78
bank_transfer	9837590.75
gift_card	9285690.44

How many Customers joined each month?

PowerBI:

Number of Users Joined by Year, Quarter and Month
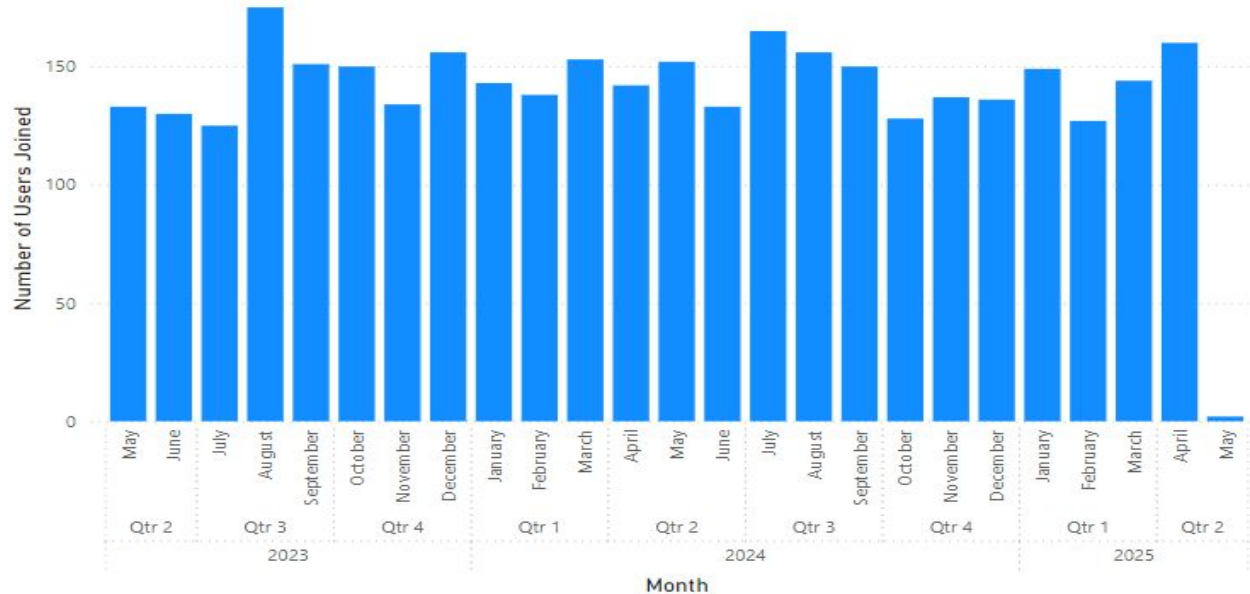
How many Customers joined each month?

SQL:

```sql
SELECT YEAR(join_date) as Year,
MONTH(join_date) as Month,
Count(*) as No_of_Customer
FROM Customers
GROUP BY Year, Month
ORDER BY Year, Month;
```

Year	Month	No_of_Customer
2023	5	133
2023	6	130
2023	7	125
2023	8	175
2023	9	151
2023	10	150
2023	11	134
2023	12	156
2024	1	143
2024	2	138
2024	3	153
2024	4	142
2024	5	152
2024	6	133
2024	7	165
2024	8	156
2024	9	150
2024	10	128
2024	11	137
2024	12	136
2025	1	149
2025	2	127
2025	3	144
2025	4	160
2025	5	2

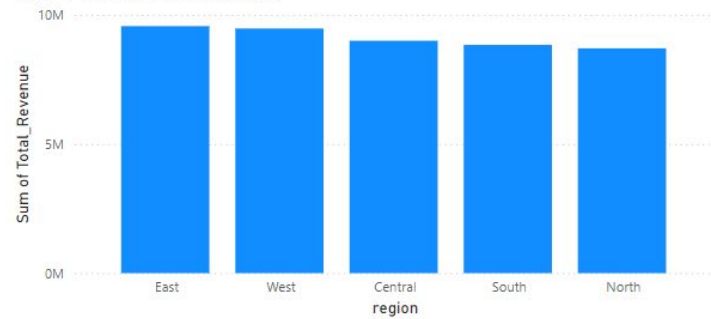# What is the average revenue per customer by region?

PowerBI:

Number of Customer by region

AverageRevenuePerCustomer by region

Sum of Total_Revenue by region
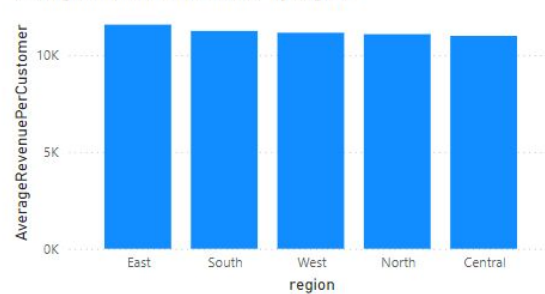
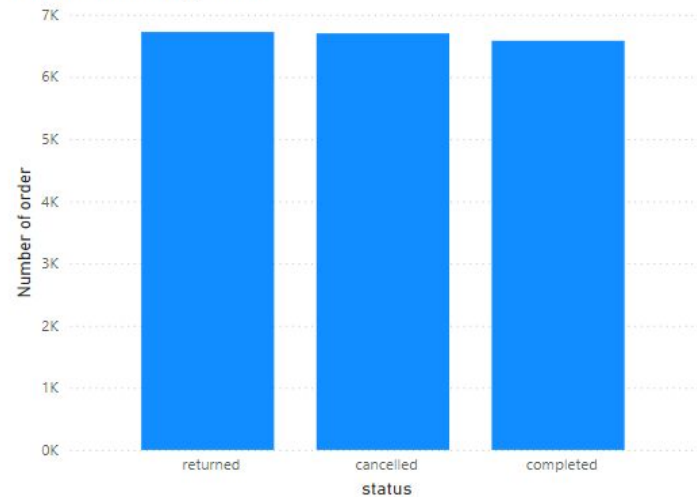# What is the average revenue per customer by region?

SQL:

```sql
SELECT c.region, COUNT(DISTINCT c.customer_id) as total_customers,
SUM(oi.quantity*oi.price) as total_revenue,
ROUND(SUM(oi.quantity*oi.price)/COUNT(DISTINCT c.customer_id),2) as AVG_revenue
FROM customers c
JOIN orders o ON c.customer_id=o.customer_id
JOIN order_items oi ON o.order_id = oi.order_id
GROUP BY c.region
order by AVG_revenue DESC;
```

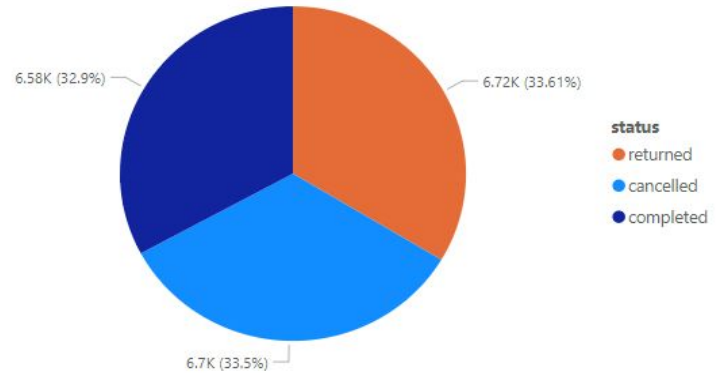| region	total_customers	total_revenue	AVG_revenue
East	703	9569970.40	13613.04
West	716	9479797.83	13239.94
South	670	8844120.72	13200.18
Central	696	9004804.94	12937.94
North	674	8710320.82	12923.32

What is the number of orders by status?

PowerBI:

Number of order by status
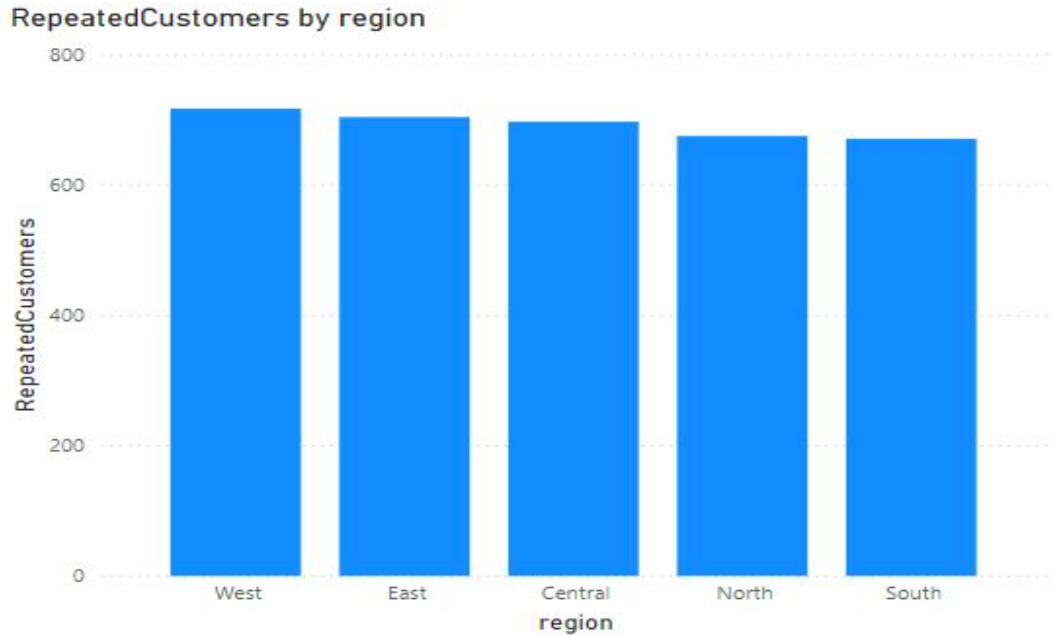
What is the number of orders by status?

SQL:

```
SELECT status, COUNT(*) as Order_Status_Count
FROM orders
GROUP BY status
ORDER BY Order_Status_Count desc;
```

status	Order_Status_Count
returned	6721
cancelled	6699
completed	6580

How many repeat customers are there in each region?

PowerBI:

# How many repeat customers are there in each region?

SQL:

```sql
SELECT c.region,
COUNT(DISTINCT o.customer_id) AS repeat_customers
FROM customers c
JOIN orders o ON c.customer_id = o.customer_id
GROUP BY c.region
HAVING COUNT(o.order_id) > 1;
```

region	repeat_customers
Central	696
East	703
North	674
South	670
West	716

Which are the top 10 product by revenue ?

PowerBI:

Total revenue by Top 10 product name
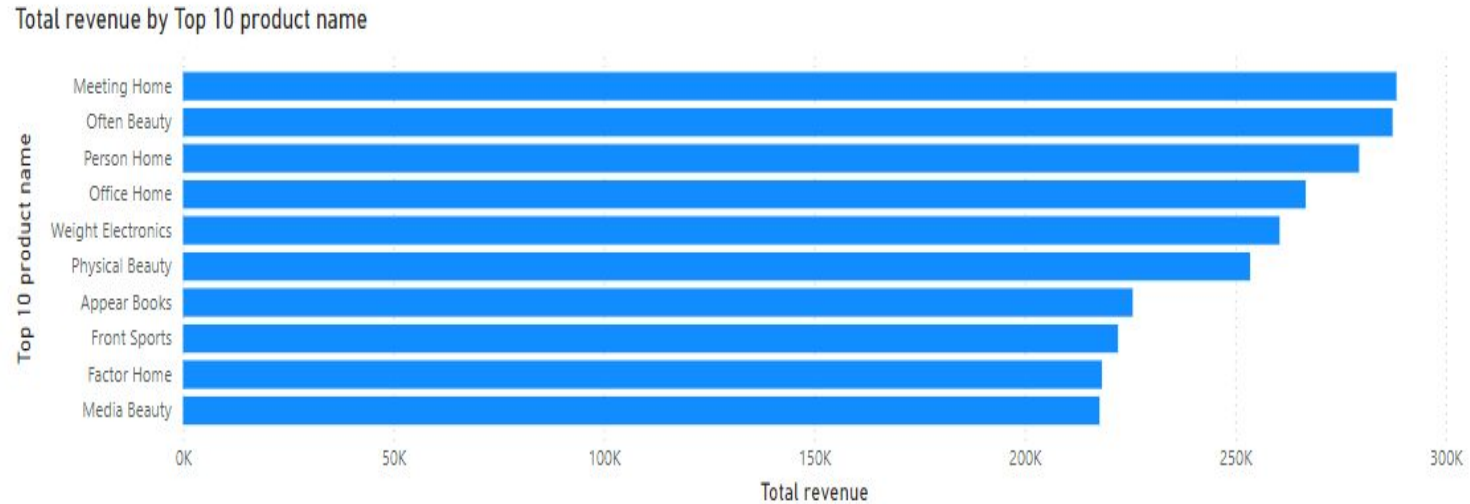
Which are the top 10 product by revenue ?

SQL:

```sql
SELECT name, SUM(price*stock) AS revenue
FROM products
GROUP BY name
ORDER BY revenue DESC
LIMIT 10 ;
```

name	revenue
Weight Electronics	353804.40
Office Home	267541.16
Person Home	257496.06
Send Clothing	235309.84
Wide Electronics	233813.25
About Electronics	229692.64
Fire Beauty	212769.24
Find Beauty	210533.42
Agree Electronics	210012.32
Law Books	204576.75