💼 2023 SALES TRENDS & CONSUMER BEHAVIOR ANALYSIS

🛒 Retail Business Intelligence Project

- 🛠 MySQL | Power BI
- 🔍 Sales Performance | Customer Segmentation | Product Insights

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Business Problem & Project Objective

In a rapidly evolving retail environment, the business lacks granular visibility into its sales performance, consumer behavior patterns, and product profitability. This limits its ability to make data-driven decisions, optimize customer engagement strategies, and maximize revenue growth.

Project Objective :

- Analyze sales trends
- Segment customers
- Evaluate product performance
- Identify high-value customers
- Build Power BI dashboard

Explore The Dataset Used For Analysis

ICON	TITLE	DESCRIPTION
👤	Customer Info	Customer ID , Gender , Age – Helps analyze buying behavior by demographics.
📦	Product Detail	Product Category , Price per Unit , Quantity – Used to asses product performance.
💰	Sales Data	Total Amount – Core metric used for revenue trends , AOV etc.
📅	Timeframe	Date – Enables monthly/ quarterly trend analysis.

Dataset : 1000 Customers | Jan –Dec 2023 | Imported in MySQL & Power BI

Result Grid	▦	🔄 Filter Rows:		Export: 📄	Wrap Cell Content: 🔠			

	Transaction ID	Date	Customer ID	Gender	Age	Product Category	Quantity	Price per Unit	Total Amount
▶	1	2023-11-24	CUST001	Male	34	Beauty	3	50	150
	2	2023-02-27	CUST002	Female	26	Clothing	2	500	1000
	3	2023-01-13	CUST003	Male	50	Electronics	1	30	30
	4	2023-05-21	CUST004	Male	37	Clothing	1	500	500
	5	2023-05-06	CUST005	Male	30	Beauty	2	50	100
	6	2023-04-25	CUST006	Female	45	Beauty	1	30	30
	7	2023-03-13	CUST007	Male	46	Clothing	2	25	50
	8	2023-02-22	CUST008	Male	30	Electronics	4	25	100

Understanding The Customers
Data And SQL Queries Foundation

Ques1. Total revenue generated by each gender.

```
47  •    SELECT Gender, SUM(`Total Amount`)
48       AS genderspecefic_spending
49        FROM retailsdataset
50       GROUP BY Gender
51       ORDER BY genderspecefic_spending DESC;
```

This query analyzes total revenue by gender to uncover customer spending patterns and demographic influence.

Helps assess how much revenue is generated per transaction, guiding pricing and marketing strategies

Ques2. Average Order Value by gender.

```
SELECT
  Gender,
  SUM(`Total Amount`) / COUNT(DISTINCT `Transaction ID`) AS avg_order_value
FROM retailsdataset
GROUP BY Gender
ORDER BY avg_order_value DESC;
```

Ques3. Which age group contributes the most to sales?

```
    •    SELECT
         CASE
             WHEN Age BETWEEN 16 AND 25 THEN '16-25'
             WHEN Age BETWEEN 26 AND 35 THEN '26-35'
             WHEN Age BETWEEN 36 AND 45 THEN '36-45'
             WHEN Age BETWEEN 46 AND 55 THEN '46-55'
             WHEN Age > 55 THEN '56+'
             ELSE 'Unknown'
         END AS age_group,
         SUM(`Total Amount`) AS total_revenue FROM retailsdataset
         GROUP BY age_group ORDER BY total_revenue DESC;
```

Identifies the age group driving the highest sales to inform targeted campaigns and product focus

Product Trend And Revenue Drivers

Ques1. Total sales by Product Category.

```sql
SELECT `Product Category`, SUM(`Total Amount`) AS Total_Sales
 FROM retailsdataset
 GROUP BY `Product Category`
 ORDER BY Total_Sales DESC;
```

The Electronics category leads in total sales, driving the highest revenue among all product categories

While Clothing sells the highest number of units across all product categories.

Ques2. Which category sells the highest no of units?

```sql
SELECT `Product Category`, SUM(`Quantity`) AS Totalquantitysold
 FROM retailsdataset
 GROUP BY `Product Category`
 ORDER BY Totalquantitysold DESC;
```

Ques3. Which product category has the highest Price per Unit?

```sql
SELECT `Product Category`, AVG(`Price per Unit`) AS Avg_price
 FROM retailsdataset
 GROUP BY `Product Category`
 ORDER BY Avg_price DESC;
```

Beauty stands out with the highest average price per unit

Clothing dominates female purchases (34.91%), mostly in the low-price range (₹0–100). Women aged 36–55+ are the most active buyers, highlighting a value-driven preference in this segment

FEMALE CONSUMER SNAPSHOT :
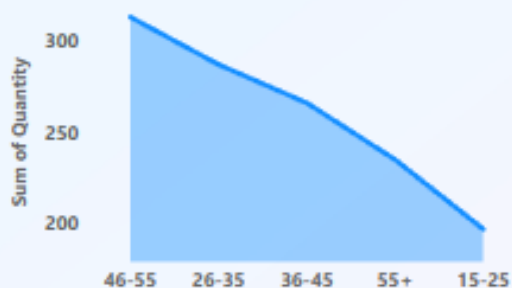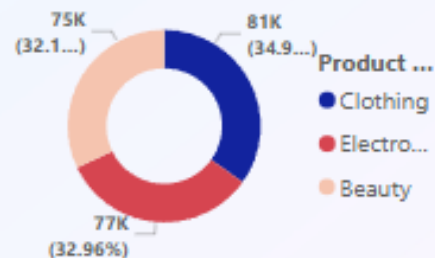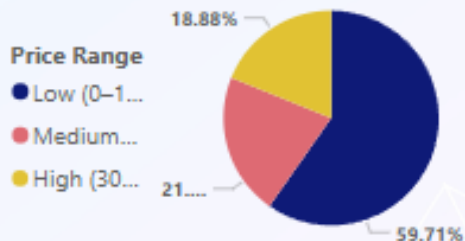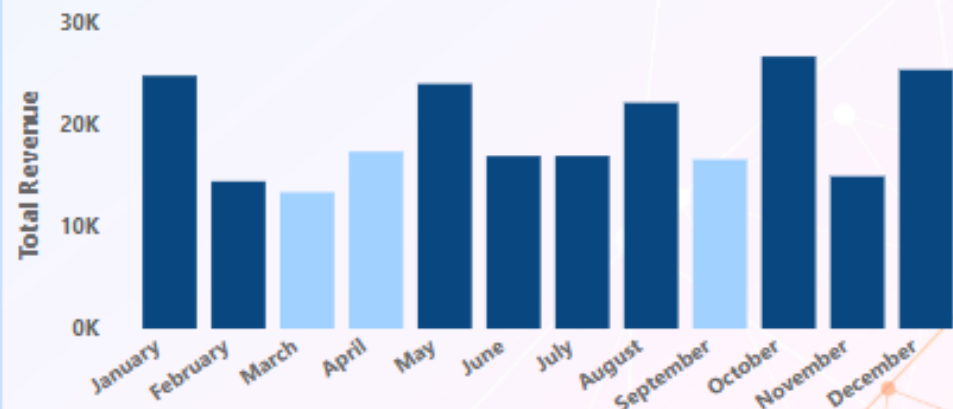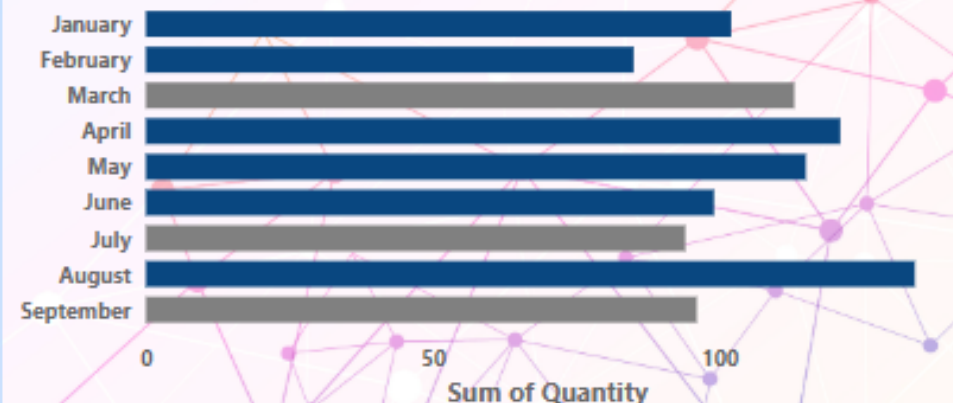
Electronics dominates male purchases (35.92%), mostly in the low-price range (₹0–100). Men aged between 45-55+ are the most active buyers of electronics while men between the age 26-35 mostly spend mostly on clothing.

MALE CONSUMER SNAPSHOT :
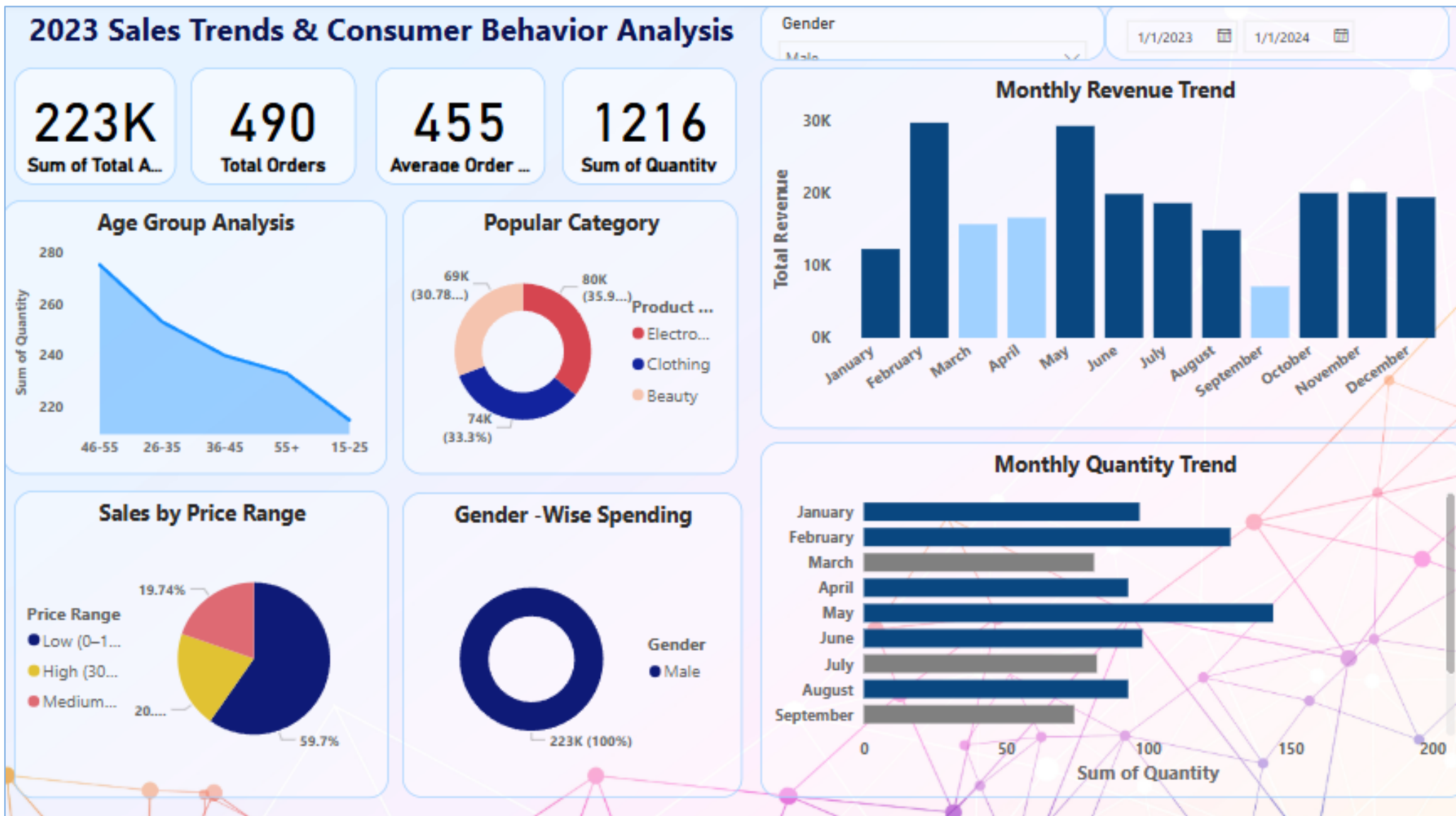
Time - Based Trend Analysis
Visual Representation

May emerged as the highest revenue-generating month in 2023, followed by October and December — highlighting seasonal demand spikes. Electronics dominated May's sales with 23,245 units sold, followed by Clothing and Beauty, making it the top revenue driver during this peak period.

Price And Quantity Insight
Data And SQL Queries

Ques1. What is the average Price per Unit across all products?
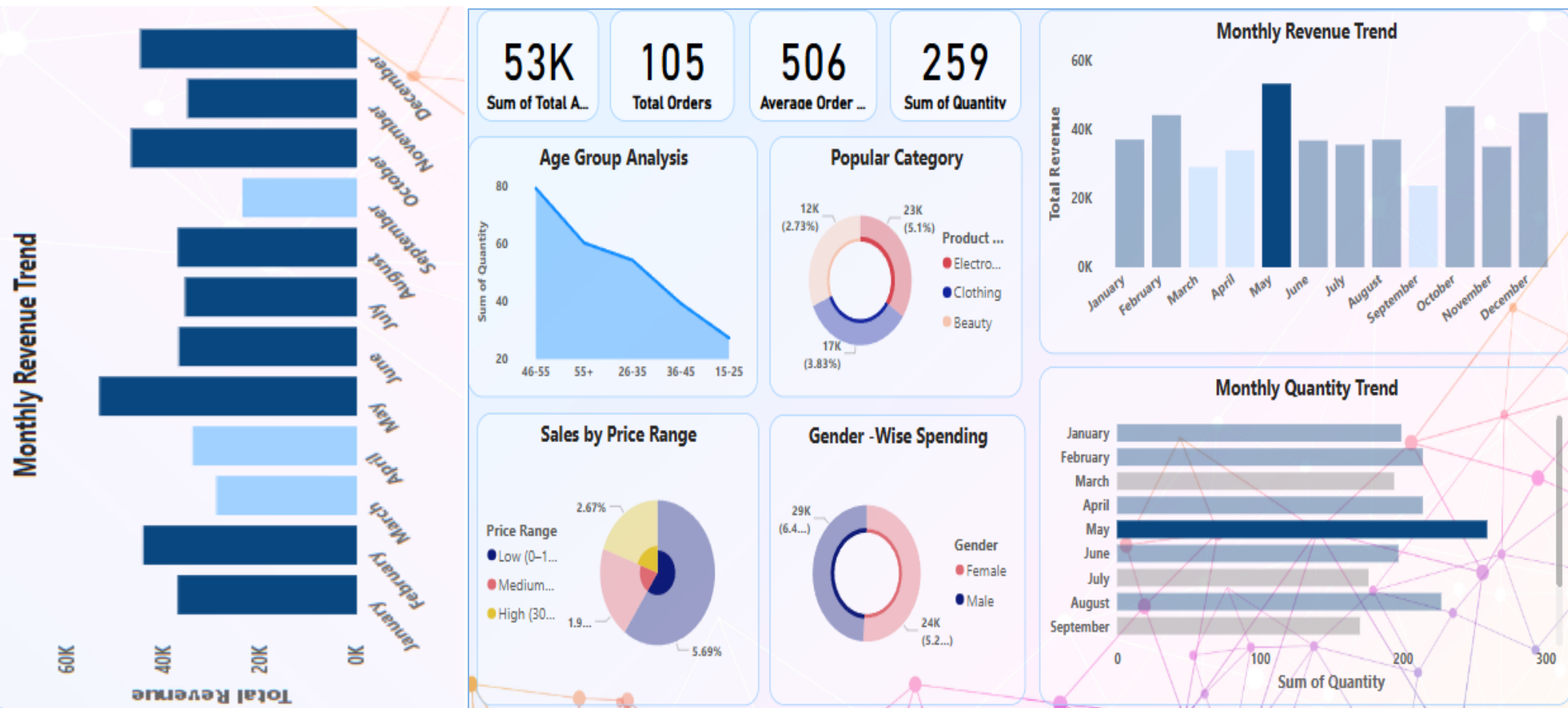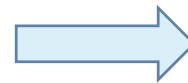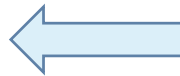
```sql
SELECT AVG(`Total Amount`) AS avg_price , `Product Category`
 FROM retailsdataset
 GROUP BY `Product Category`
 ORDER BY avg_price;
```

Helps us benchmark product pricing and identify outliers driving either high volume or high margin.

Ques2. Find correlation between Price per Unit and Quantity sold.

```sql
SELECT
  `Price per Unit`,
  AVG(Quantity) AS avg_quantity_sold
FROM retailsdataset
GROUP BY `Price per Unit`
ORDER BY `Price per Unit`;
```

Shows if products with higher price per unit are sold in higher or lower quantity.

Ques3. Which Product Category has the highest price - quantity ratio ?

```sql
SELECT
`Product Category`,
AVG(`Price per Unit` / Quantity) AS avg_PTQ_ratio
FROM retailsdataset
GROUP BY `Product Category`
ORDER BY avg_PTQ_ratio DESC;
```
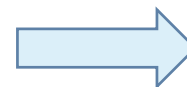
Electronic products are those products that are very expensive relative to how much quantity sells.

Strategic Insights

- **Electronics**
- drives the most revenue—invest in promotions and inventory planning.

- **Clothing**
- sees high sales volume—offers can boost customer retention.

- **Beauty**
- has the highest unit price—consider bundling or loyalty offers to increase quantity sold.

Top Product Performers

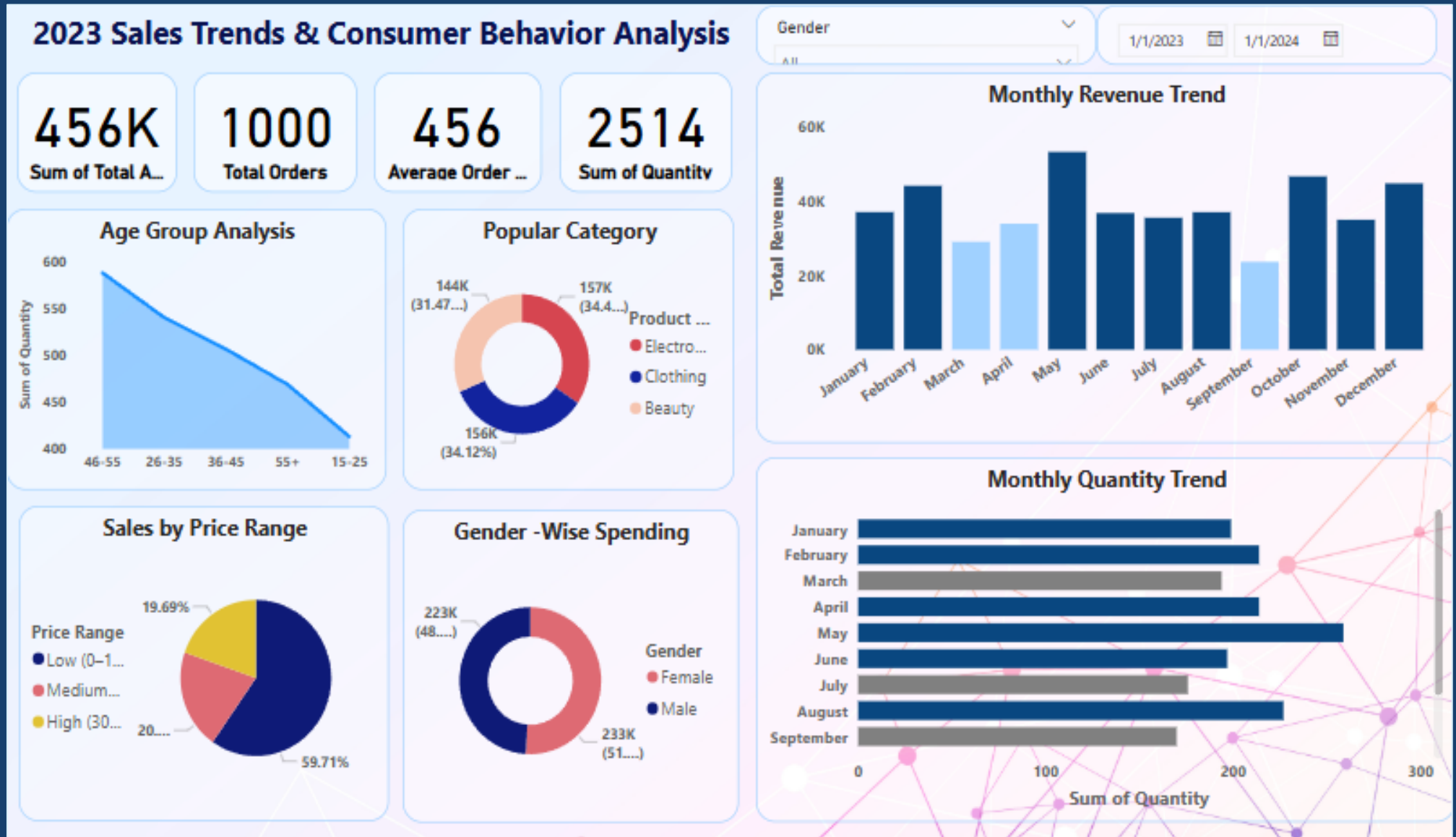🚀 **Top Product Performers:**

Highest Revenue Generator: Electronics — ₹23,245

Most Units Sold: Clothing

Highest Price per Unit: Beauty

Complete Dashboard View

- **KEY HIGHLIGHTS :**
- Gender and age group filters offer deeper customer segmentation.
- Date range slicer allows tracking seasonal trends.
- Product category filters help compare category-wise performance across metrics.

Strategic Recommendations Backed by SQL Insights

Ques1. Which product gives the long-term benefit?

```sql
SELECT
  `Product Category`,
  SUM(`Total Amount`) AS total_revenue,
  SUM(Quantity) AS total_quant_sold,
  AVG(`Price per Unit`) AS avg_price
FROM retailsdataset
GROUP BY `Product Category`
ORDER BY total_revenue DESC;
```

Ques2. Product with high quantity but low revenue?

```sql
SELECT
  `Product Category`,SUM(`Total Amount`) AS total_revenue,
  SUM(Quantity) AS total_quantity_sold,
  AVG(`Price per Unit`) AS avg_price FROM retailsdataset
GROUP BY `Product Category` HAVING total_revenue < 1500000
ORDER BY total_quantity_sold DESC;
```

Ques3. Product with low quantity but high price?

```sql
SELECT
  `Product Category`,SUM(`Total Amount`) AS total_revenue,
  SUM(Quantity) AS total_quantity_sold,
  AVG(`Price per Unit`) AS avg_price
FROM retailsdataset
GROUP BY `Product Category`HAVING total_quantity_sold < 800
ORDER BY avg_price DESC;
```

•**Electronics** emerge as a high-revenue category with consistent sales volume, indicating strong market demand and potential for long-term profitability.

•**Clothing** drives high unit sales but contributes comparatively lower revenue, suggesting an opportunity for **price optimization** or premium product lines to enhance margins.

•**Beauty** products reflect a high price point but low sales volume. Targeted **promotions, bundling strategies, or seasonal discounts** could improve traction and unlock untapped market potential.

Final Summary & Business Values

Value Delivered

- Identified top-performing products driving long term revenue.

- Pinpointed areas needing pricing and promotional improvements.

- Uncovered key customer segments and buying patterns.

- Revealed seasonal trends to guide strategic planning.

The project effectively utilized SQL and Power BI to perform an in-depth analysis of retail sales data across critical dimensions including time, gender, product categories, pricing, and purchase quantity. This data-driven approach enabled the identification of key revenue contributors, deep insights into customer behavior, and strategic areas requiring optimization to drive sustainable business growth.

Impact Created

- **COMMERCIAL**

- Enables data-driven decisions across pricing, marketing, and inventory management.

- **BUSINESS**

- Establishes a solid foundation for future predictive analytics and targeted marketing strategies.