Exploratory Data Analysis (EDA)

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1. Introduction

This report presents an Exploratory Data Analysis (EDA) of a dataset comprising customers, products, and transaction records. The goal is to uncover key insights that can help improve business strategies and customer engagement.

2. Data Overview

- **Customers Dataset:** Contains customer IDs, names, regions, and signup dates.

- **Products Dataset:** Includes product IDs, names, categories, and prices.

- **Transactions Dataset:** Records transaction IDs, customer IDs, product IDs, transaction dates, quantities, prices, and total values.

## 3. Data Cleaning & Preprocessing

- Missing values were identified and handled appropriately.

- Duplicates were checked and removed.

- Date columns were converted to the correct format.

4. Key Findings and Business Insights

Below are five key insights derived from the EDA:

1. Sales Trends and Fluctuations

- Time range: January 2024 - January 2025.

- Sales trends show substantial variations over time with no clear, stable pattern.

- Peaks and valleys indicate periods of high and low sales.

- Possible external influences: market trends, promotions, economic conditions.
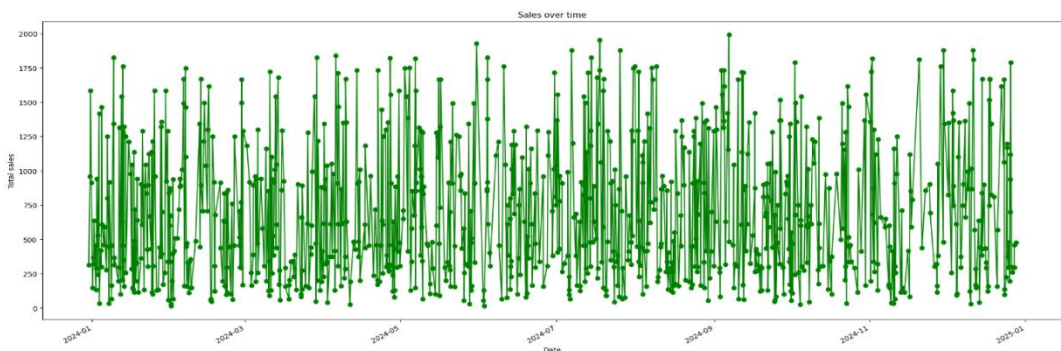
- **Business Recommendation:** Refine inventory planning, marketing strategies, and business operations to stabilize sales.

2. Top 10 Products Performance

- Highlights the most popular products based on units sold.

- Best-selling products: P054 and P059 with significant sales.

- Sales figures decline as the ranking progresses.
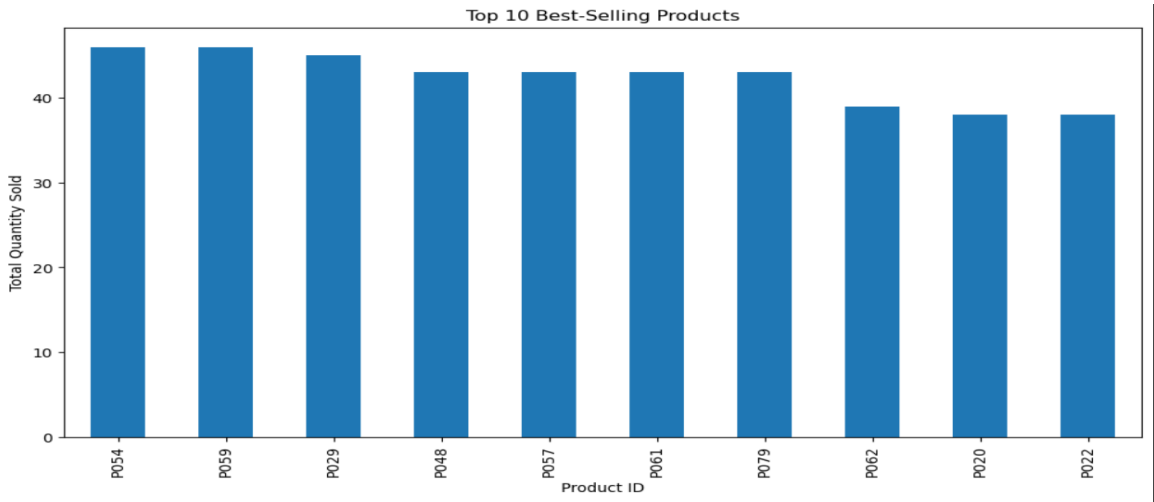
- **Business Recommendation:** Prioritize promoting and restocking top-performing products. Optimize inventory and marketing for consistent sales growth.

**3. Revenue Breakdown by Category**

- Electronics and books generate the highest revenue.

- Clothing and home decor have experienced a decline in revenue.
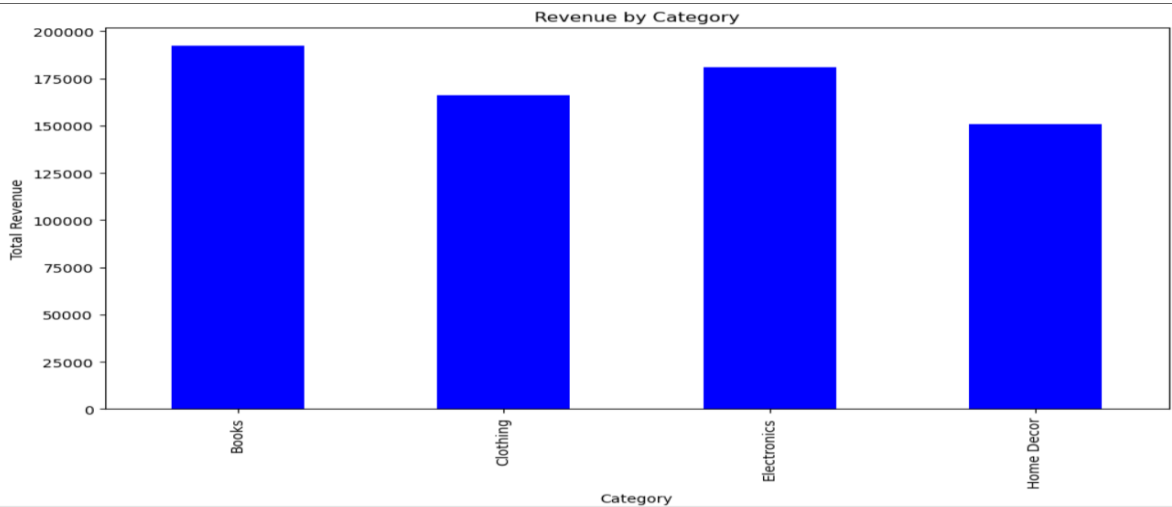
- **Business Recommendation:** Reallocate resources to maximize profitability. Investigate reasons for declining sales in certain categories.

4. Customer Distribution Across Regions

- Key regions: South America (29.5%), Europe (25%), North America (23%), and Asia (22.5%).

- South America leads in customer base, while Asia has the smallest share.

Customer Distribution by Region
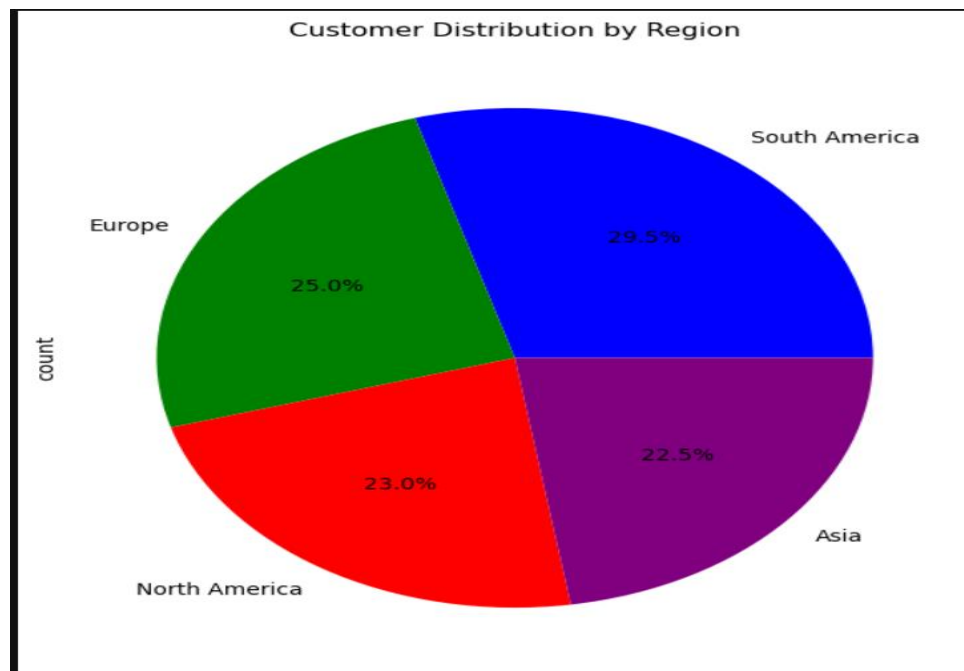
- **Business Recommendation:** Maximize marketing strategies in strong regions and explore expansion opportunities in underperforming areas.

5. Average Customer Spending

- The average customer spending is **$3,467.31**.

- Indicates strong purchasing power among customers.

- **Business Recommendation:** Tailor pricing and promotions to maintain or increase average spending per customer. Consider upselling and bundling strategies.

Conclusion

The analysis provided valuable insights into customer behavior, product performance, and sales trends. Implementing the recommendations can enhance business strategies, optimize marketing efforts, and drive revenue growth.