

# Title: Exploratory Data Analysis Report on eCommerce Transactions Dataset

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## 1. Introduction

Provide a brief overview of the dataset and the objective of the assignment. For example:

The eCommerce Transactions dataset consists of three key files: `Customers.csv`, `Products.csv`, and `Transactions.csv`. This analysis aims to uncover business insights by performing exploratory data analysis (EDA) and visualizing trends. Key focus areas include customer behavior, product performance, and regional sales trends. The ultimate goal is to derive actionable recommendations to enhance business strategies.

## 2. Methodology

Outline the steps taken to perform EDA and generate insights. For example:

The approach to this analysis involved:

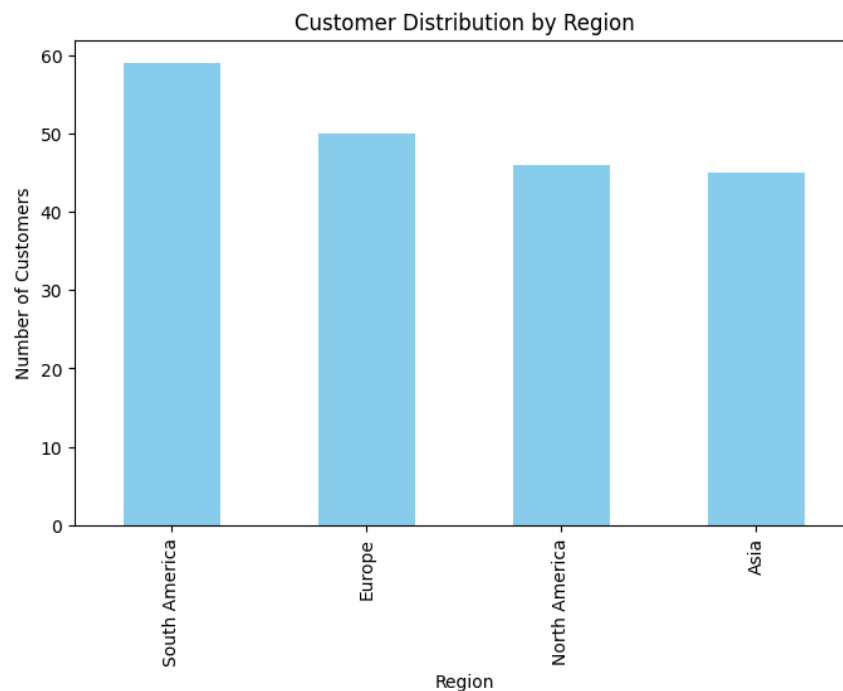
- **Data Cleaning:** Ensuring consistency across datasets, handling missing values, and converting date fields to datetime format.
- **Data Integration:** Merging the three datasets using `CustomerID` and `ProductID` as keys to form a unified dataset.
- **Feature Engineering:** Extracting new features such as `SignupDuration` and transaction frequency to enrich analysis.
- **Visualization:** Using bar charts, line plots, and summary statistics to identify trends and anomalies.
- **Insight Generation:** Synthesizing findings from the data to provide actionable business recommendations.

### 3. Insights

Clearly and concisely write five business insights, each backed by data. For example:

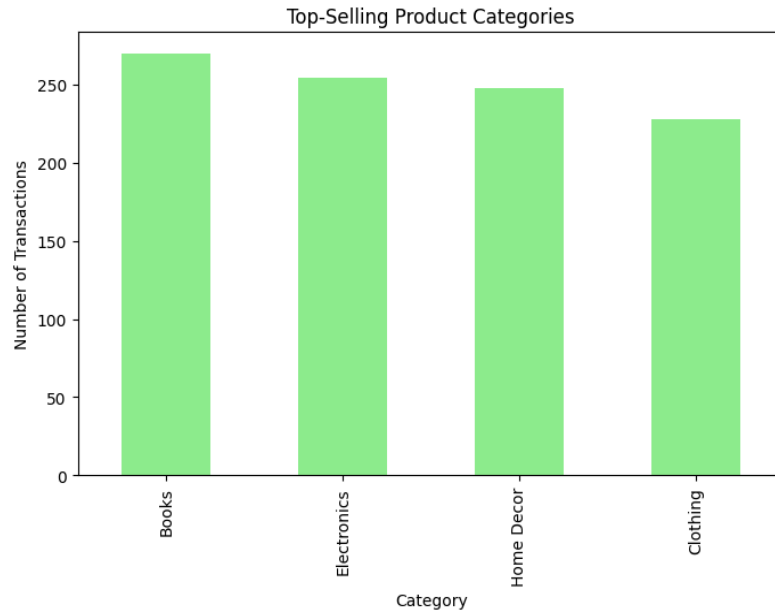
#### 1. Insight 1: Region-wise Customer Distribution

- Customers from **South America** make up the majority with 29.5%, followed by Europe with 25%. This suggests South America is a key market for the business and others are not far off.



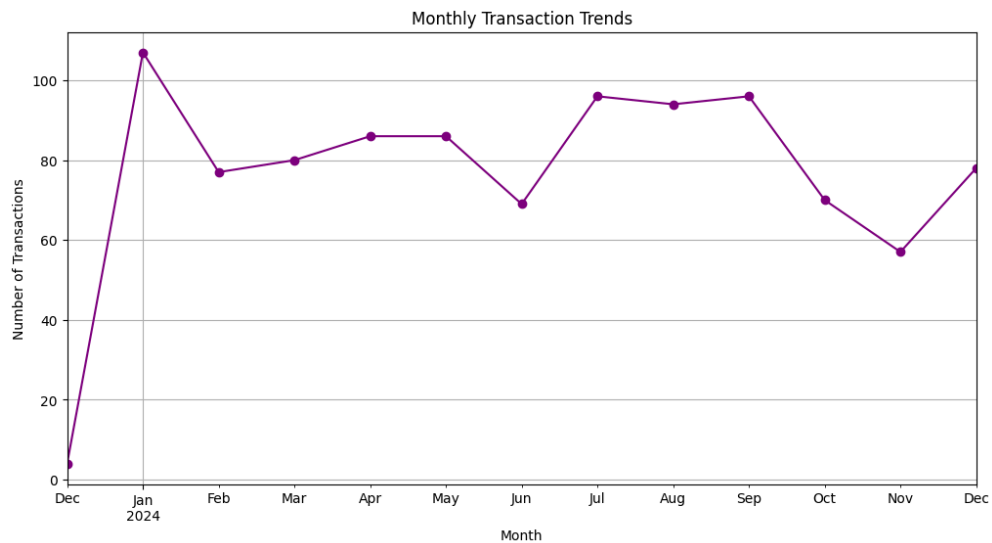
#### 2. Insight 2: Top Selling product

- Books are the top selling product only contribute 27% of total sales followed by Electronics 25.4%. So sales are equally distributed.



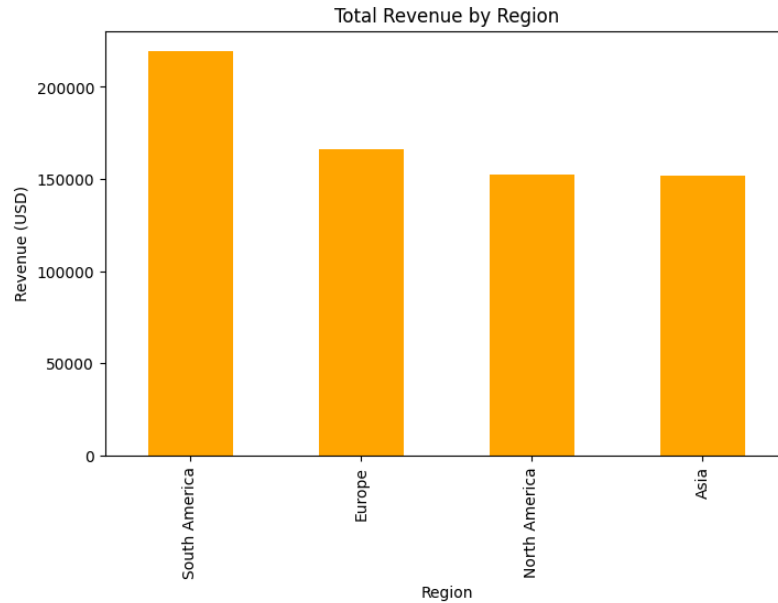
### 3. Insight 3: Transaction over time

- Transactions peak in **Jan 2024**, likely due to new year shopping and market, indicating opportunities for targeted promotions.



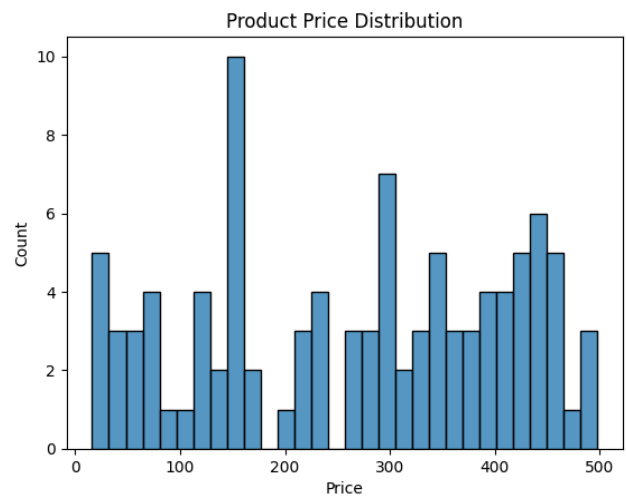
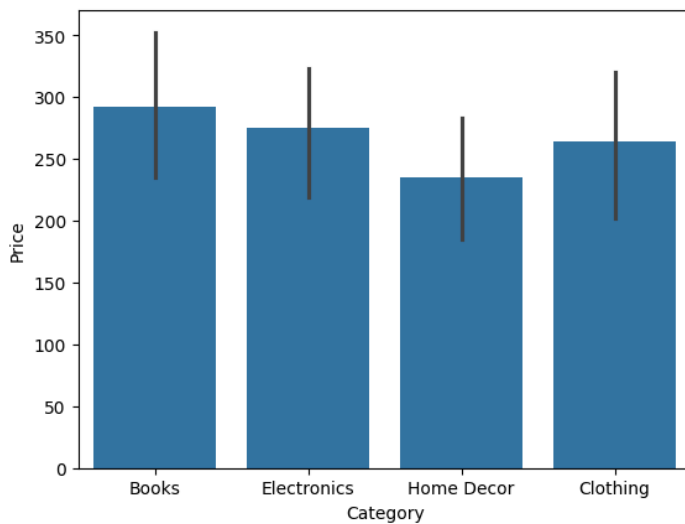
#### 4. Insight 4: Revenue generated by region

- South America generated majority of revenue of 31.79%, followed by Europe with 24.9%



#### 5. Insight 5: Product distribution per price

- Spending of Top 10 spenders ranged from 10673.87 to 6708.10 USD.
- Unexpectedly, Books were one with higher average prices.



## 4. Conclusion

The analysis highlights several key insights regarding customer distribution, product performance, revenue generation, and customer spending patterns:

1. **South America** emerges as the largest market with 29.5% of customers and contributes the highest revenue (31.79%), indicating its critical role in driving business success. However, Europe and other regions are close contenders and should not be overlooked in growth strategies.
2. **Books**, while being the top-selling product category with 27% of total sales, surprisingly have a higher average price compared to other categories. This suggests an opportunity to further capitalize on premium book sales.
3. **Electronics** contribute 25.4% of sales, showing a balanced distribution across product categories, which reduces dependency on a single category.
4. Transactions peaking in **January 2024** align with the New Year shopping season. This underscores the potential of running region-specific, targeted promotions during this period to maximize sales.
5. The **Top 10 spenders**, contributing significantly to revenue (spending between \$10,673.87 and \$6,708.10), reinforce the importance of retaining high-value customers through personalized offers, loyalty programs, or exclusive deals.

### Recommendations

- Focus marketing and sales efforts on **South America** to strengthen dominance while exploring ways to grow market share in Europe and other regions.
- Leverage the high average price of books by promoting premium collections or bundles to maximize revenue from this category.
- Launch tailored **New Year campaigns** with discounts or promotions to capitalize on the January shopping trend.
- Design a **loyalty program** targeting top spenders to maintain their engagement and encourage repeat purchases.
- Diversify product offerings while maintaining a balance across categories to sustain consistent revenue streams.

These findings and recommendations provide a foundation for strategic decisions to boost revenue, optimize marketing efforts, and enhance customer engagement.