Introduction

The purpose of this analysis is to gain actionable insights into the performance of an eCommerce business using three datasets: **Customers**, **Products**, and **Transactions**. This study focuses on understanding customer demographics, product preferences, and transaction patterns to identify key trends and opportunities for business growth.

As a fresher in data science, I conducted Exploratory Data Analysis (EDA) on the provided datasets to uncover key trends and patterns in customer sign-ups, sales performance, and product categories. Using basic visualizations and descriptive statistics, I aimed to analyze the data and generate insights to support better business decisions. While this analysis provides valuable findings, I understand the need to dive deeper into advanced techniques as I continue to learn and grow in this field.

Findings

1. **Customer and Regional Diversity**
    - The dataset contains **200 unique customers** from **4 regions**, with **South America** being the most frequent region (59 customers). This suggests the business has a strong presence in South America, but opportunities exist to expand its reach in other regions.
2. **Product Price Distribution**
    - The prices of products range from 16.08 to 497.76, with an average price of 267.55. Most prices fall between 147.77 (25th percentile) and 397.09 (75th percentile), showing a wide variety of product pricing to cater to different customer segments.
3. **Transaction Quantity and Value**
    - On average, customers purchase 2.54 items per transaction, with a maximum of 4 items. The average transaction value is 689.99, and transactions can go as high as 1991.04, indicating potential big-ticket purchases.
4. **Sign-Up Trends**
    - Customers signed up on 179 unique dates, with some dates like 2022-04-16 having a frequency of 3 sign-ups. This could indicate targeted campaigns or promotions that drove higher sign-ups on specific days.
5. **Sales Variability**
    - The standard deviation of total transaction value is 493.14, reflecting significant variability in customer spending habits. While some customers make small purchases, others account for much larger transactions, emphasizing the importance of identifying and retaining high-value customers.

Business Insights

Strong Customer Presence in South America

- South America has the largest customer base (59 out of 200), indicating strong regional dominance. There’s potential for growth by targeting customers in other regions, like Asia or Europe.

Diverse Pricing Strategy

- Product prices range from 16.08 to 497.76, catering to both budget-conscious and high-end shoppers. This diverse pricing strategy can appeal to different market segments.

High Transaction Value for Select Customers

- Some transactions reach as high as 1991.04, highlighting high-value customers. Tailored loyalty programs or personalized offers can enhance retention and increase revenue from these key customers.

Peaks in Customer Sign-Ups

- Specific dates, like 2022-04-16, show spikes in sign-ups, likely due to successful marketing campaigns. Understanding the triggers behind these peaks could help replicate the success in future promotions.

Significant Variability in Spending

- A high standard deviation in transaction values (493.14) reveals diverse spending behaviors. Segmenting customers based on their purchasing habits could optimize targeted campaigns and product offerings, improving customer satisfaction.

Conclusion

The exploratory analysis of the eCommerce dataset revealed valuable insights into customer demographics, product pricing, and transaction patterns. South America emerged as the most active region, highlighting potential for growth in other regions. The product pricing range indicates a diverse portfolio catering to different customer segments, while transaction data suggests variability in purchasing behaviors and the presence of high-value customers.

While these findings provide a strong foundation for understanding the business, there is scope for deeper analysis to uncover more advanced insights. As a fresher, I aim to continue building my skills to extract even greater value from such datasets in the future.