# Exploratory Data Analysis (EDA) and Business Insights

Objective: The goal of this analysis is to analyse the data and find keys insights.

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1. Surge in Transaction Activity in 2024

- **Visualization of Clusters:**
  User sign-ups have steadily increased across 2022, 2023, and 2024, but transaction volumes were notably low in 2023. However, 2024 saw a significant boom in transaction activity, suggesting a shift in user behavior. This surge indicates improved customer engagement, possibly due to enhanced product offerings or successful marketing strategies. This presents an opportunity for the business to leverage the growing user base and further investigate the factors driving the transaction increase, enabling targeted strategies to sustain and amplify growth moving forward.
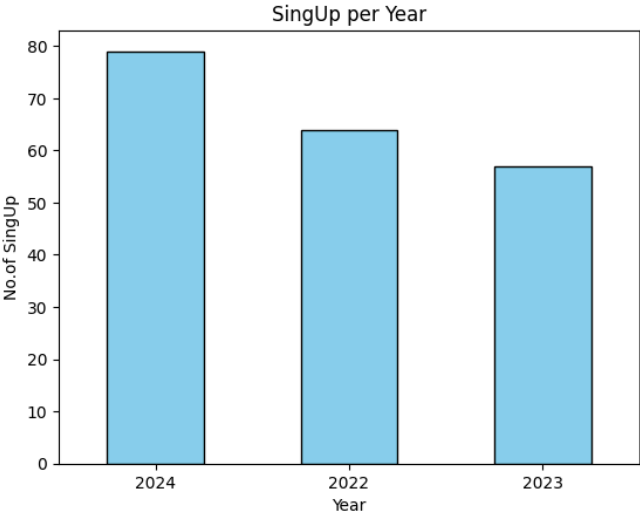

SingUp Based On Year
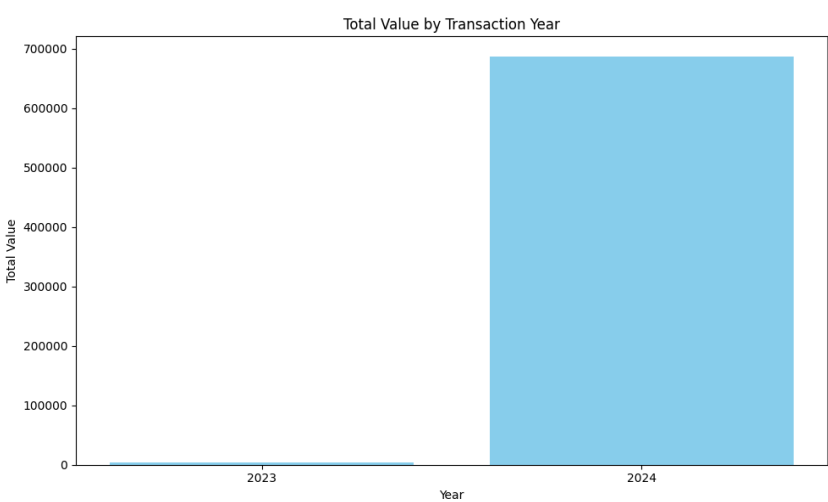
Transaction based on year

### 2. Seasonal Transaction Trends

Our analysis shows an interesting seasonal trend where months with higher transaction volumes, such as January, often result in lower total transaction value. In contrast, December sees a lower number of transactions but a significantly higher total value. This suggests that while January attracts more frequent transactions, the individual transaction amounts are smaller, possibly due to promotions or smaller purchases. December, on the other hand, sees larger, less frequent transactions, likely driven by end-of-year spending behavior or special offers. Understanding these patterns can help optimize pricing strategies and marketing efforts for these months.
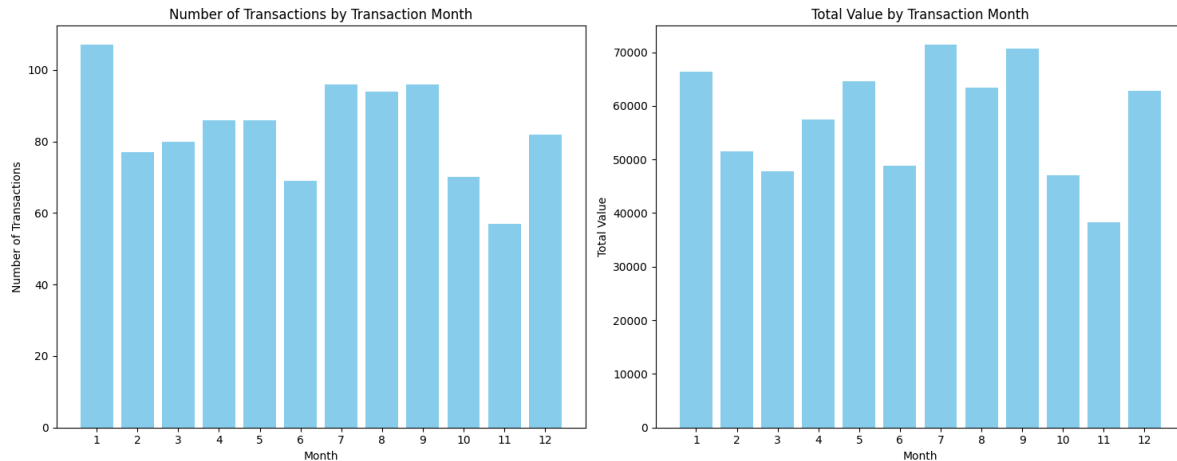
Graph containing Number of transactions and Total value for each month

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3. Regional Transaction Value Trends

Our analysis reveals that while South America generates the highest total transaction value across regions, the average transaction value remains relatively consistent across all regions. This suggests that while South America may have a higher volume of transactions contributing to the total value, other regions maintain similar average spend per transaction. This insight presents an opportunity to explore ways to further increase the transaction volume in other regions to drive overall revenue, while maintaining the consistency of average transaction values across markets.
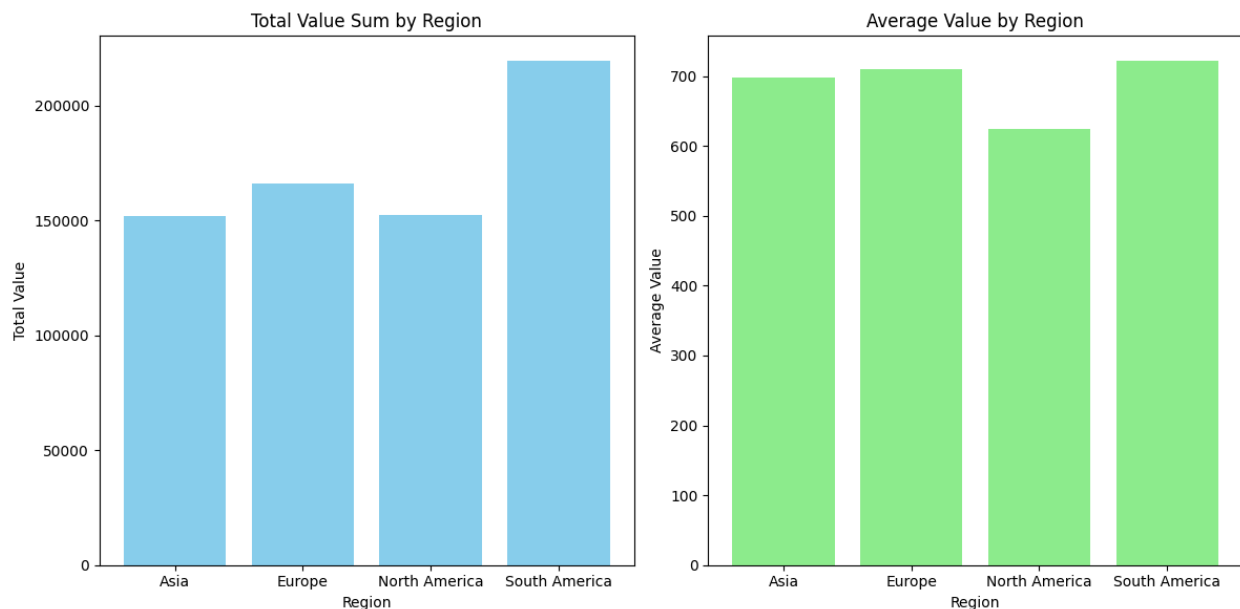

Total and average transaction value across region

4. Customer Rebuying Behavior by Category

The data indicates that customers are most likely to repeatedly purchase clothing (10), followed by home decor (7), electronics (5), and books (3). This suggests that clothing and home decor are categories with higher customer retention and frequent rebuying behavior. The recurring purchases in these categories may be driven by fashion trends, seasonal updates, or a need for replenishment. In contrast, electronics and books have lower repeat purchase rates, indicating that these products are typically bought less frequently. This insight highlights an opportunity to focus retention strategies on high-repeat categories while exploring ways to increase rebuying in other product segments.

4. Transaction Trends by Time of Day

Our analysis shows that transactions are highest in the morning across all regions, followed by a gradual decline throughout the afternoon and evening. However, there is a notable peak in transactions during the night. This pattern suggests that while mornings see significant engagement, the evening and afternoon periods experience a dip, possibly due to lower user activity or competition for attention. The night peak may reflect late-night shoppers or a surge in specific activities. This insight highlights the opportunity to optimize marketing campaigns, promotions, and user engagement strategies to align with these time-specific trends.
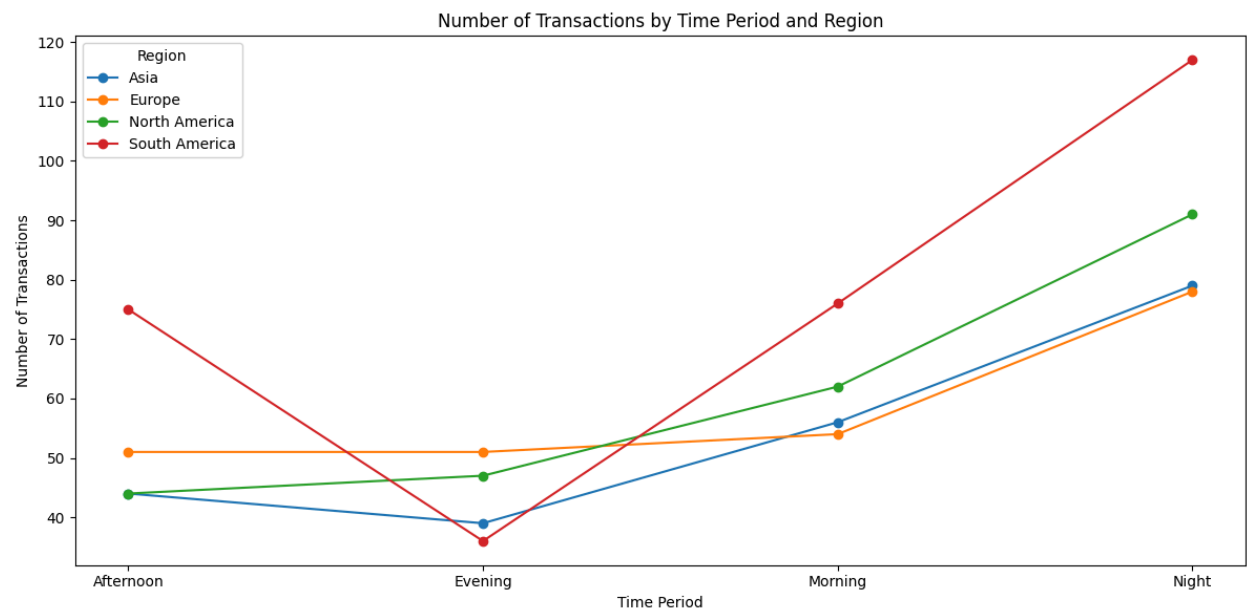
Transaction Trend based on different time and region