Exploratory Data Analysis (EDA) and Business Insights

Insight 1: Most Profitable Product Categories

The analysis of product categories reveals that Books generate the highest total revenue at $192,147.47, followed closely by Electronics ($180,783.50) and Clothing ($166,170.66). Home Decor ($150,893.93) also contributes significantly to overall sales. The dominance of Books suggests a strong demand in this category, possibly driven by recurring purchases, educational needs, or niche interests. Electronics, while slightly behind, likely benefits from higher price points and technological advancements. Understanding these trends can help businesses optimize inventory, focus on high-performing categories, and develop targeted marketing strategies to maximize profitability across all segments.

Insight 2: Regions Generating the Highest Revenue

The analysis highlights the regions that generate the most revenue, with South America leading at $219,352.56. Europe follows closely with $166,254.63, while North America and Asia contribute $152,313.40 and $152,074.97, respectively. South America stands out as a dominant revenue driver, indicating potential for targeted marketing or product expansion. Europe and North America, though slightly behind, still represent significant revenue sources. This geographical insight suggests that businesses should prioritize regional strategies, optimize resources, and cater to specific regional demands to sustain and further boost profitability.

Insight 3: Customer Retention Analysis

The analysis of customer signup to first purchase reveals a wide variation in time taken for the first purchase. While a significant number of customers make a purchase almost immediately after signing up, there is a notable segment that takes much longer, sometimes spanning several hundred days. This delay suggests potential gaps in retention strategies, where customers may lose interest or are not sufficiently engaged. By analyzing the average time between signup and first purchase, businesses can refine their marketing tactics, implement personalized offers, and

enhance user experience to boost quicker conversions and improve overall customer retention.

Insight 4: Trends in Customer Purchasing Behavior

The analysis of customer purchasing behavior throughout 2024 reveals clear seasonal trends and fluctuations. A significant surge in transactions occurs early in the year, likely driven by holiday promotions or New Year discounts. Purchasing activity then fluctuates, with notable spikes in May, July, and September, possibly linked to seasonal demand or targeted marketing campaigns. A dip is observed in October and November, followed by a rise in December due to holiday shopping. These patterns indicate that customer purchases are heavily influenced by external factors such as discounts, promotions, and seasonal shifts, providing key insights for optimizing future sales strategies.

Insight 5: Top 10 Customers by Revenue

The top 10 customers by revenue contribute a substantial portion to overall sales, with the highest spender (C0141) generating $10,673.87. Revenue among the top 10 customers shows a gradual decline, indicating varying levels of spending. These high-value customers are crucial for sustained business success, highlighting their importance in the company's growth. By analyzing their purchasing behavior, businesses can develop tailored marketing strategies, such as personalized offers, loyalty programs, or exclusive deals, to further engage and retain these customers. Strengthening relationships with top spenders can boost long-term revenue and increase customer loyalty.