

5 Business Insights from the EDA

Insight 1: Customer and Product Distribution Analysis

Region-wise Total Customers: South America has the highest number of customers, followed by Europe, North America, and Asia. This indicates South America could be a key region for driving sales and customer engagement.

Category-wise Product Distribution: Products from the "Books" and "Electronics" categories dominate the catalog, followed by "Clothing" and "Home Décor." Businesses can focus on expanding or marketing these popular categories to meet customer demand.

Top Spending Customers: The top 10 customers contribute significantly to total revenue. Targeted marketing campaigns and loyalty programs for these high-value customers can enhance revenue and retention.

Insight 2: Total Revenue by Product Categories

The analysis reveals that **Books** generated \$1,92,147.47 which is the highest revenue overall, followed by **Electronics**, **Clothing**, and **Home Decor**. This indicates that "Books" and "Electronics" are the primary revenue drivers. Business efforts can focus on enhancing inventory, optimizing pricing, and running promotions in these high-performing categories to maximize revenue.

Insight 3: Regional Revenue Contribution by Category

South America leads in revenue generation followed by Asia, Europe, and North America. Each region has unique category preferences. South America excels in "Books" with a revenue of \$69,000, and "Electronics" with \$59,000, while Asia shows a preference for "Clothing" and "Electronics." Europe mirrors South America's preference for "Books," and North America leads with "Electronics." With these insights, we can personalize regional marketing strategies to emphasize high-performing categories in each region. For example, promotions for "Clothing" in Asia and "Books" in South America and Europe could maximize returns. Additionally, understanding these regional preferences can guide inventory allocation and regional pricing strategies.

Insight 4: Monthly Sales Trends

The monthly sales trend reveals significant fluctuations in revenue throughout the year, with peaks in July (\$71,366.39) and September (\$70,603.75). Conversely, November (\$38,224.37) and December 2023 (\$3,769.52) show the lowest sales, highlighting potential periods of reduced demand. We use these insights to optimize marketing efforts and promotions during high-revenue months, such as July and September, and strategize to boost sales during slower periods, like November. Seasonal campaigns, targeted discounts, or bundling offers could be employed to increase engagement during low-demand months, ensuring a steadier revenue flow year-round. Also, the inventory can be handled accordingly during the fluctuating demands.

Insight 5: Customer Behavior

The clustering analysis highlights three different customer segments based on their spending, transaction count, and purchase quantities. Cluster 2 comprises high-value customers contributing \$330,069.11 in revenue, making 483 transactions, and purchasing 1,209 items. Cluster 1 represents mid-tier customers, while Cluster 0 includes lower-value customers. Regionally, South America leads with high-value customers (30 in Cluster 2), emphasizing its strategic importance. Europe and North America also contribute significantly to Cluster 2.

Focus on retaining high-value customers (Cluster 2) through loyalty programs and personalized offers. For mid- and low-tier clusters, implement targeted upselling and cross-selling strategies to boost engagement and spending.