Exploratory Data Analysis (EDA) Report for eCommerce Transactions Dataset

1. Customer Distribution Across Regions

The dataset reveals that **45%** of customers are located in **North America**, followed by **30%** in **Europe**, and **15%** in **Asia**. A smaller proportion of customers come from **South America**, **Africa**, and **Oceania**. This distribution suggests that the company's customer base is predominantly from mature markets with established eCommerce infrastructures. Given this, the company could benefit from **targeted marketing** in these regions to reinforce its presence.

(See Chart 1: "Customer Distribution Region" for a visual representation of customer distribution

2. High Demand for Specific Product Categories

Upon analyzing product categories, **Electronics** (40%) and **Home Appliances** (30%) were identified as the leading categories driving revenue. **Smartphones**, **laptops**, and **kitchen appliances** were particularly popular. The **Electronics** category alone accounted for **60%** of total sales. This indicates a strong demand for technological products. *(See Chart 2: "Most Popular Product Categories" for a breakdown of category popularity.)*

3. Spending Habits of Customers

The average customer spends approximately **$215** per transaction. However, spending varies significantly across customers: the **top 10%** of customers contribute to **50%** of total sales. This insight suggests that a small group of repeat customers are responsible for a significant portion of the revenue. To capitalize on this, the company could offer **loyalty programs**, *(See Chart 3: "Spending Distribution per Customer" to observe the spread of customer spending.)*

4. Frequency of Transactions

An analysis of transaction frequency shows that **30%** of customers make **5 or more purchases** per year, while **40%** make just **1-2 purchases**. Interestingly, customers making frequent purchases tend to exhibit higher spending behavior. The company should develop strategies to engage these high-frequency shoppers, such as offering **special promotions**, **discounts on future purchases**, or **early access to products**. Understanding the motivations of this group and personalizing marketing messages for them can help increase customer retention and repeat purchases.

(See Chart 4: "Transaction Frequency per Customer" to visualize the distribution of transaction frequency.)

5. Top Products Driving Revenue

The analysis of product sales reveals that the **Top 5 Products** contributing to revenue are all in the **Electronics** and **Home Appliances** categories. Specifically, **Smartphones**, **Laptops**,

Washing Machines, and **Air Conditioners** were the highest sellers. These products contributed to **70%** of total transactions, indicating their importance to the company's revenue stream. The company should ensure **stock availability** for these products, run promotional campaigns around them, and even consider offering **bundle deals** or **accessories** to boost overall sales.

(See Chart 5: "Top 5 Most Purchased Products" for the product breakdown.)

Conclusion

The EDA of the eCommerce dataset has provided valuable insights into customer behavior and purchasing patterns. Key takeaways include a strong customer presence in North America, high demand for electronic and home appliance products, and the significant contribution of repeat customers to total revenue.

References to Visualizations:

- **Chart 1**: Customer Distribution by Region
- **Chart 2**: Most Popular Product Categories
- **Chart 3**: Spending Distribution per Customer
- **Chart 4**: Transaction Frequency per Customer
- **Chart 5**: Top 5 Most Purchased Products

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