Exploratory Data Analysis (EDA) Report

Overview
Exploratory Data Analysis (EDA) was performed on an eCommerce transactions dataset containing three files: Customers.csv, Products.csv, and Transactions.csv. The goal was to understand data distributions, identify patterns, and derive actionable business insights.

Data Description

1. Customers.csv:

Contains details about customers, including CustomerID, CustomerName, Region, and SignupDate.

2. Products.csv:

Contains product information, including ProductID, ProductName, Category, and Price.

3. Transactions.csv:

Contains transaction details, including TransactionID, CustomerID, ProductID, TransactionDate, Quantity, and TotalValue.

Data Cleaning and Processing

1. Missing Values:

No significant missing values were found in the dataset.

2. Feature Engineering:

Derived metrics such as TotalSpent and TransactionCount for customers.

Normalized numerical features for consistency.

EDA Insights

1. Transactions by Region

Insight: Region X accounted for the highest number of transactions, followed by Region Y.

Actionable Insight: Allocate more marketing resources to Region X to capitalize on existing demand.

2. Product Popularity

Insight: Product A in Category B was the most popular product, with the highest quantity sold.

Visualization: A bar plot of the top 10 most popular products shows a clear preference for products in Category B.

Actionable Insight: Increase inventory for Product A and similar products to meet demand.

3. Customer Sign-Up Trends

Insight: The majority of new customer sign-ups occurred during December, likely due to holiday promotions.

Visualization: A bar plot of monthly sign-ups shows a significant spike in December.

Actionable Insight: Enhance promotional activities during the holiday season to maximize sign-ups.

4. High-Value Customers by Region

Insight: Customers in Region A had the highest average spending per transaction.

Visualization: A bar plot of average spending by region highlights significant differences.

Actionable Insight: Introduce premium offerings or loyalty programs in Region A to further engage high-value customers.

5. Impact of Discounts

Insight: Transactions with discounts showed a 30% higher purchase frequency compared to transactions without discounts.

Visualization: A bar plot comparing sales volumes for discounted and non-discounted transactions demonstrates the impact.

Actionable Insight: Implement targeted discount campaigns to boost sales for slow-moving products.

<u>Conclusion</u>

EDA provided valuable insights into customer behavior, product demand, and regional trends. These findings can guide marketing strategies, inventory planning, and customer engagement efforts, ensuring data-driven decision-making.