Data Science Assignment: eCommerce

Transactions Dataset

Overview:

You are provided with an eCommerce Transactions dataset consisting of three files: Customers.csv, Products.csv, and Transactions.csv. Your task is to perform exploratory data analysis (EDA), build predictive models, and derive actionable insights. This assignment will test your data analysis, machine learning, and business insight generation skills.

Insight 1: Regional Revenue Trends

- **Observation**: Analysis of the Region column from the Customers.csv file and the TotalValue column from the Transactions.csv file reveals that certain regions, such as North America and Europe, contribute significantly more revenue compared to others.
- **Actionable Insight**: Focus marketing and promotional campaigns in high-revenue regions to maximize returns. For underperforming regions, investigate potential barriers (e.g., logistical issues, lack of awareness) and address them to improve sales.

Insight 2: Top-Selling Products and Categories

- **Observation**: The Category column in Products.csv and transaction data indicate that categories like "Electronics" and "Fashion" consistently generate the highest sales. Within these categories, specific products (e.g., "Smartphones" in Electronics) are top sellers.
- **Actionable Insight**: Increase inventory for high-demand products and categories. Offer discounts or bundle deals to further boost sales of these products. For lower-performing categories, consider running targeted promotions or discontinuing unprofitable products.

Insight 3: Customer Segmentation by Spending Habits

- **Observation**: Segmenting customers based on their total spending (sum of TotalValue for each CustomerID) shows that a small percentage of customers (e.g., top 10%) contribute disproportionately to overall revenue.

- **Actionable Insight**: Implement a loyalty program for high-value customers to retain them. Offer personalized discounts or exclusive products to this segment. For low-spending customers, use targeted email campaigns to increase engagement and spending.

Insight 4: Seasonal and Temporal Trends

- **Observation**: Analyzing the TransactionDate column reveals seasonal spikes in transactions, such as during holidays or end-of-season sales. Weekdays versus weekends also show variations in purchasing behavior.
- **Actionable Insight**: Plan marketing and inventory strategies around peak seasons. Launch promotional campaigns during high-traffic periods and optimize operational efficiency (e.g., delivery and customer support) during these times.

Insight 5: Price Sensitivity and Discounts

- **Observation**: Comparing the Price and Quantity columns in the Transactions.csv file shows that lower-priced products often sell in higher quantities. Additionally, discounts lead to noticeable spikes in sales volumes.
- **Actionable Insight**: Implement dynamic pricing strategies for price-sensitive products. Use discounts strategically to clear slow-moving inventory or attract price-sensitive customers. For premium products, emphasize quality and exclusivity in marketing.