***Customer Segmentation and Sales Analysis Report***

**1. Introduction**

**Objective**: This analysis aims to segment customers and analyze sales trends for a retail company using RFM (Recency, Frequency, Monetary) analysis. It also identifies actionable strategies for sales improvement through customer behavior insights and trend analysis.

**2. Data Cleaning**

**Dataset Overview:**

The dataset includes 363 rows and 10 columns, featuring fields like Customer ID, Order Date, Product ID, Category, Region, Quantity, Unit Price, and Total Amount.

**Data Preprocessing Steps:**

* **Missing Values**: All missing values were removed from the dataset to ensure consistency.
* **Date Format Standardization**: The Order Date was standardized to datetime format for consistency.
* **Duplicate Records**: All duplicate records were removed to ensure data accuracy.
* **Outcome**: The dataset is now clean and ready for analysis.

**3. Customer Segmentation (RFM Analysis)**

**Methodology:**

Customers were segmented using RFM analysis based on:

* **Recency**: Days since the last purchase.
* **Frequency**: Number of orders placed.
* **Monetary**: Total amount spent.

**Results:**

The customer base was segmented into three key categories:

* **High-Value Customers**: Regular buyers who contribute the most revenue.
* **At-Risk Customers**: Customers with a high likelihood of churn.
* **New Customers**: Recent acquisitions with growth potential.
* **Customer Segment Distribution**:
  + New Customers: 182
  + At-Risk Customers: 181

**4. Sales Trend Analysis**

**Monthly and Yearly Trends:**

Sales showed fluctuation across different months:

* Peak sales occurred during certain months, such as December and January.
* Significant low periods, such as February, suggest an opportunity to run promotions to stimulate sales.

**Top Product Categories:**

* **Clothing and Electronics** performed well, with consistent demand across regions.
* **Books** had low sales, indicating potential for improvement with focused marketing.

**Regional Sales Distribution:**

* **East and West** regions performed significantly differently, with the East contributing the most sales and the West showing underperformance, highlighting growth potential.

**5. Data Visualization**

**Visual Representations:**

* **Line Chart**: Monthly sales trends show clear seasonal patterns.
* **Bar Chart**: The Top Product Categories chart shows which categories contributed the most.
* **Pie Chart**: Regional sales distribution provides insights into geographic performance.

**6. Recommendations**

* **Retain High-Value Customers**: Implement loyalty programs.
* **Engage At-Risk Customers**: Initiate re-engagement campaigns to win back potential churners.
* **Expand Product Categories**: Focus on high-performing categories, and strategize for underperforming ones like books.
* **Optimize Regional Performance**: Boost sales in lower-performing regions through targeted marketing.

**7. Conclusion**

Through data cleaning, segmentation, and sales trend analysis, the retail company can improve its sales strategy by targeting customer segments effectively, optimizing product offerings, and focusing on underperforming regions.