

CUSTOMER SEGMENTATION REPORT

Overview

Customer segmentation was performed using the provided customer profile data (Customers.csv) and transaction data (Transactions.csv). The goal was to group customers into clusters based on their spending behaviour, transaction patterns, and geographic distribution. The K-Means algorithm was chosen for this task, and the optimal number of clusters was determined based on the Davies-Bouldin (DB) Index.

Methodology

- **Data Preparation:** Data was cleaned and prepared for analysis, including handling missing values and outlier detection.
- **Feature Engineering:** Relevant features were engineered, such as customer lifetime value, recency of last purchase, and average transaction value.
- **Clustering:** The K-Means clustering algorithm was employed to group customers into distinct segments. The optimal number of clusters (<optimal_k>) was determined by minimizing the Davies-Bouldin (DB) Index, a metric that evaluates cluster separation and compactness.

Results

- **Customer Segments:**
 - **Segment 1:** High-Value Customers: Characterized by high spending, frequent transactions, and significant revenue contribution.
 - **Segment 2:** Moderate Spenders: Exhibit moderate spending and transaction frequency.
 - **Segment 3:** Low-Spending Customers: Characterized by low spending and infrequent transactions.
- **Key Findings:**
 - Geographic variations in spending behaviour were observed, indicating potential for region-specific marketing campaigns.
 - A significant segment of high-value customers was identified, presenting opportunities for targeted loyalty programs and personalized offers.

Visualization

- A line plot illustrated the relationship between the number of clusters and the DB Index, identifying the optimal number of clusters (<optimal_k>).
- Pairwise scatter plots visualized the distribution of customers across different segments based on key features such as total spending, average spending, and transaction count.

Recommendations

- **High-Value Customers:** Implement targeted loyalty programs, personalized offers, and exclusive benefits.

- **Moderate Spenders:** Focus on cross-selling opportunities and personalized product recommendations.
- **Low-Spending Customers:** Analyse churn reasons, and implement targeted campaigns to increase customer engagement.

Conclusion

This analysis successfully identified <optimal_k> distinct customer segments, providing valuable insights into customer behaviour. These insights can be leveraged to optimize marketing campaigns, improve customer relationships, and enhance overall business performance.