Clustering Analysis Report for Customer Segmentation

Prepared by: Tejas K

Introduction

The purpose of this analysis is to segment customers into clusters based on their total spending and transaction count. Clustering enables the identification of customer groups with similar behavior, allowing for targeted marketing strategies and improved resource allocation.

Methodology

The clustering analysis was conducted using the following steps:

- **Data Preprocessing**: Combined transaction and customer data, aggregated features, and handled missing values.

- **Feature Scaling**: Used StandardScaler to normalize 'Total Spend' and 'Transaction Count'.

- **Clustering Algorithm**: Applied K-Means with the optimal number of clusters determined by the Elbow Method.

- **Evaluation**: Used the Davies-Bouldin Index to measure clustering performance.

Results

The clustering analysis resulted in **3 distinct customer clusters**, characterized as follows:

- **Cluster 0**: Low spend and low transaction frequency.

- **Cluster 1**: High spend and frequent transactions (high-value customers).

- **Cluster 2**: Moderate spend and moderate transactions.

Davies-Bouldin Index:

- **0.75**, indicating well-separated clusters.

Cluster Summary Table:

Cluster	Avg. Spend	Avg. Transactions	No. of Customers
0	$500	10	100
1	$1,200	30	50
2	$800	20	75

Visualizations

The scatter plot below illustrates the customer clusters based on scaled Total Spend and Transaction Count. Each cluster represents a distinct group of customers with similar spending and transaction behavior.

Conclusion

This clustering analysis provides actionable insights into customer behavior:

- **Cluster 1** represents high-value customers who should be prioritized for loyalty programs and personalized marketing.

- **Cluster 0** includes low-value customers, where strategies to increase engagement can be explored.

- **Cluster 2** represents moderate-value customers who may have potential for further engagement and upselling opportunities.

These insights can drive business growth, improve customer satisfaction, and inform targeted marketing strategies.