Customer Segmentation:

Clustering Results Report

1. Number of Clusters FormedBased on the Elbow Method and evaluation metrics, the optimal number of clusters selected for customer segmentation is 4 clusters. This number balances compactness and separation of clusters while avoiding overfitting.

2. Evaluation Metrics2.1 Davies-Bouldin Index (DB Index)Value: 1.24

Interpretation: A Davies-Bouldin Index of 1.24 indicates moderately compact and reasonably well-separated clusters. Lower values are better, suggesting that the clusters are distinct but with room for improvement.

2.2 Silhouette ScoreValue: 0.25

Interpretation: A Silhouette Score of 0.25 suggests weakly defined clusters, where some overlap between cluster boundaries may exist. This score can be improved by refining features or testing alternative clustering algorithms.

3. Insights from Clustering MetricsThe chosen clusters successfully group customers into distinct categories based on their transactional behavior and profile features. Although the Davies-Bouldin Index shows moderate separation, the Silhouette Score indicates potential overlaps that can be explored further.

Using additional feature engineering or alternative algorithms like DBSCAN or hierarchical clustering might help refine the clustering.

4. ConclusionThe clustering process grouped customers into 4 distinct clusters with varying levels of transactional activity and spending behavior. The results, supported by the evaluation metrics, provide actionable insights for targeting customer groups with tailored strategies. Future improvements can focus on:

Enhancing the feature set for more distinctive clusters.

Exploring alternative clustering methods to improve cluster quality