

Customer Segmentation Clustering

Introduction:

This report summarizes the results of the customer segmentation analysis using clustering. The aim was to group customers based on both profile and transaction data to uncover patterns and behaviors.

Key Findings:

- **Optimal Number of Clusters:** 2 clusters, based on the **Silhouette Score**.
- **Davies-Bouldin Index:** **0.72** (lower values indicate better cluster separation).
- **Silhouette Score:** **0.49** (higher values indicate better cluster cohesion and separation).

Methodology:

1. **Clustering Algorithm:** **KMeans** clustering was applied with different numbers of clusters (from 2 to 10) to evaluate optimal segmentation.
2. **Metrics:**
 - **Davies-Bouldin Index:** Measures cluster separation. The lowest DB Index was **0.72** for 2 clusters.
 - **Silhouette Score:** Evaluates how well-separated the clusters are. The highest Silhouette Score of **0.49** occurred for 2 clusters.
3. **Elbow Method:** Supported the choice of **2 clusters** as optimal, as it showed minimal improvements beyond this point.

Conclusion:

- The optimal segmentation resulted in **2 clusters**, with a **Silhouette Score of 0.49** and a **Davies-Bouldin Index of 0.72**, indicating well-separated and cohesive clusters.
- These results can be used for targeted marketing, customer behavior analysis, and product recommendations.