**Segmentation of Customers or Clustering Report:**

1. Number of Clusters

Evaluation of various metrics for the KMeans clustering algorithm predicted the optimal number of clusters. 3 was the best number after testing different cluster numbers ranging from 2 to 10 for customer segmentation. This choice was based on the evaluation of both the Davies-Bouldin Index and Silhouette Score.

2. Davies-Bouldin Index (DBI)

The Davies-Bouldin Index (DBI) is a metric used to evaluate the compactness and separation of clusters, with lower values indicating higher-quality clustering (i.e., more distinct and tighter clusters).

Optimal Number of Clusters (K=3): DBI: 1.278

The value of 1.278 for the DBI suggests the existence of some moderate loose packing within the clusters.

3. Silhouette Score

The Silhouette Score measures how similar a point is to its own cluster compared to other clusters. Higher values of the silhouette score mean that the clusters are better-formed and points are placed properly with reference to the clusters.

Optimal Number of Clusters (K=3): Silhouette Score: 0.330

The value of 0.330 in the Silhouette Score reveals that the clusters show a quite acceptable degree of separation, but they could require some refinement to further perfect the process of clustering. A higher score would indicate that the clusters are better defined.

4. Cluster Visualization

To further interpret the clusters, we conducted PCA to restrict the analysis to just two dimensions. The plot below is colored by cluster assignment to show the given customer cluster allocation. Each point in the plot represents a customer, whilst each color represents a specific customer cluster.

**Metric Value**

**Number of Clusters** 3

**DB Index** 1.278

**Silhouette Score** 0.330