Clustering Report

The clustering analysis was performed using K-means algorithm.

1. Optimal Number of Clusters
   The analysis determined that 8 clusters is the optimal number for segmenting the customer data. This was selected based on the Davies-Bouldin Index, which showed the lowest (best) value of 0.7271 with 8 clusters.

2. Clustering Quality Metrics

- Davies-Bouldin Index: 0.7271
- Silhouette Score: 0.4877

3. Trend Analysis

- The Davies-Bouldin Index generally improved (decreased) as the number of clusters increased up to 8, before starting to worsen again
- Silhouette scores showed consistent improvement from 2 clusters (0.4180) to 10 clusters (0.5223), suggesting that the clusters remained well-defined even with more granular segmentation

4. Visualization Insights
   The scatter plot shows clear separation between the 8 clusters, with distinct groupings visible across both feature dimensions. The clusters appear to be well-distributed across the feature space, with minimal overlap between different segments.