

Clustering Report

1. Number of Clusters Formed

After evaluating the Davies-Bouldin (DB) Index for different numbers of clusters, the optimal number of clusters was determined to be 2.

- Clusters were chosen based on the lowest DB Index value, indicating better-defined and well-separated clusters.

2. DB Index Value

The Davies-Bouldin Index (DBI) for the optimal clustering configuration is **0.9326276410648637**.

Interpretation of DB Index:

The DB Index measures the ratio of within-cluster scatter to between-cluster separation. Lower values are better and indicate more compact and distinct clusters.

Customer Segments:

- Cluster 0: High-value customers with frequent purchases and higher total spend
- Cluster 1: Regular customers with moderate purchase frequency and lower total spend

Regional Distribution:

- South America has the highest number of customers (about 58)
- Europe follows with approximately 50 customers.
- Asia and North America have relatively balanced customer bases

Purchase Patterns:

- Average transaction value varies significantly across clusters
- Some products show consistent demand across both segments
- Seasonal variations are observed in purchase behaviour

Customer Acquisition:

- Steady growth in new customer signups over 2024
- Higher acquisition rates in certain regions.

This clustering model provides valuable insights for targeted marketing strategies and customer relationship management. The relatively low Davies-Bouldin Index indicates good cluster separation