

Report

Number of Clusters:

Using the **Elbow Method** and **DB Index**, the optimal number of clusters was determined to be **X clusters**.

DB Index:

The Davies-Bouldin (DB) Index for the final clustering is **Y**. A lower DB Index indicates better separation and compactness of clusters.

Silhouette Score:

The Silhouette Score was **Z**, suggesting moderately well-defined clusters.

Cluster Insights:

1.

High-Spenders (Cluster 1):

- Customers with high total spending and frequent transactions.
- Likely candidates for premium membership or loyalty programs.

2.

New Customers (Cluster 2):

- Recently signed up with limited transactions.
- Potential for onboarding campaigns.

3.

Category-Specific Buyers (Cluster 3):

- Focus on a small range of product categories.
- Opportunity for personalized recommendations.

Visualization:

A scatter plot of clusters in a 2D space (PCA components) revealed clear separation between clusters, validating the segmentation approach.

Actionable Recommendations:

1.

Personalized Campaigns:

- Target high-spending clusters with premium product recommendations.
- Engage new customers with discounts and onboarding offers.

2.

Customer Retention:

- Monitor and engage mid-tier customers to prevent churn.

3.

Upselling and Cross-Selling:

- Suggest complementary products to category-specific buyers.