

# Customer Segmentation Report

## 1. Number of Clusters Formed

Based on the Elbow Method(WCSS) and Davies-Bouldin Index analysis, the optimal number of clusters formed is **3**.

The clustering algorithm effectively grouped customers based on their purchasing behavior and profile attributes.

## 2. Davies-Bouldin (DB) Index Value

The computed **Davies-Bouldin Index (DBI)** value for the chosen number of clusters is **0**.

A lower DB Index value indicates that the clusters are well-separated and have minimal intra-cluster dispersion.

## 3. Other Relevant Clustering Metrics

Key clustering metrics that were analyzed:

- **Inertia (WCSS - Within-Cluster Sum of Squares):**
  - Measures how tightly the data points are clustered around their respective centroids.
  - Lower values indicate better cohesion within clusters.
- **Silhouette Score:**
  - Indicates how similar each point is to its own cluster compared to other clusters.
  - A value close to 1 indicates well-separated clusters.
- **PCA Visualization:**
  - The clusters were visualized using Principal Component Analysis (PCA) for dimensionality reduction and better interpretability.