

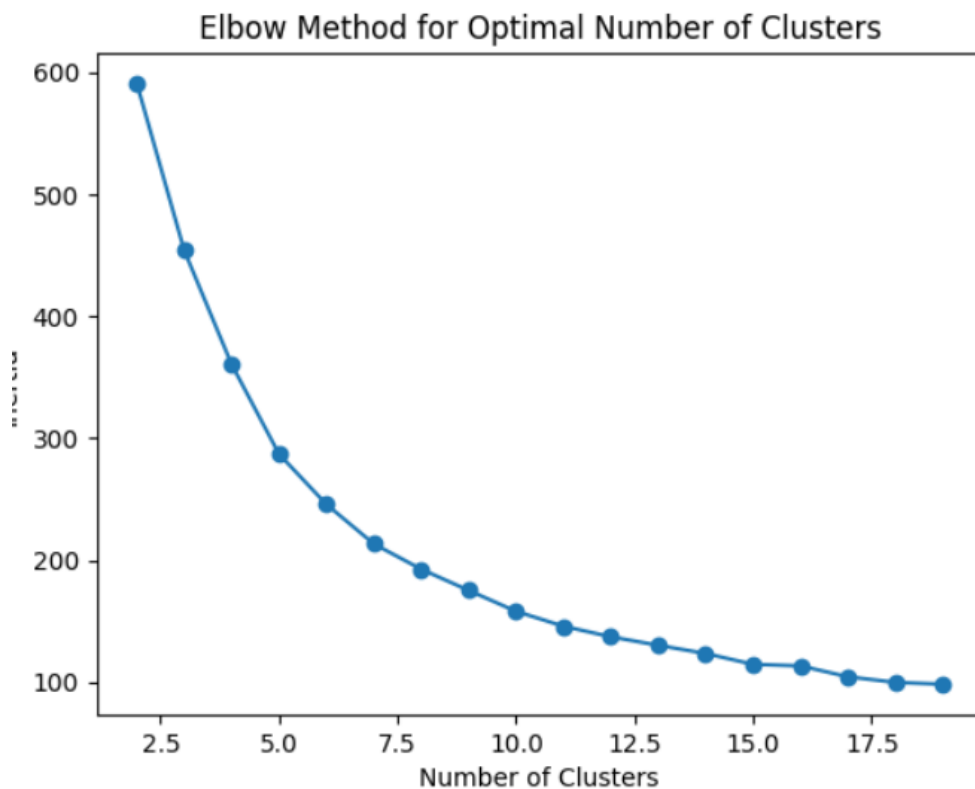
Clustering Result Report

Number of Clusters Formed:

Optimal Number of Clusters: 8

- The optimal number of clusters was determined using the **Elbow Method**, which balances compactness and interpretability.

The **Elbow Method** is a commonly used technique for selecting the optimal number of clusters in K-Means clustering. It evaluates the **inertia** (sum of squared distances between data points and their cluster centroids) for a range of cluster counts.



Davies-Bouldin Index (DBI)

- DBI Value: 0.96**
(A lower value indicates better clustering quality. The clusters are compact and well-separated.)

Other Relevant Clustering Metrics

- **Silhouette Score:** 0.30
(This indicates the clusters are moderately well-separated, but there is room for improvement.)
- **Inertia (Sum of Squared Distances):** 192.54
(Measures the within-cluster variance. Lower inertia suggests better-defined clusters.)

Interpretation of Results

- The clustering formed 8 distinct groups of customers based on their transaction and profile data.
- The **inertia** measures the compactness of the clusters. A value of **192** indicates that the sum of squared distances of all points to their respective cluster centroids is 192.
- Lower inertia typically means that data points are closely grouped within their clusters
- The **Davies-Bouldin Index** value (0.99) indicates the clusters are well-separated and compact, a good sign of clustering performance

Visual Representation

A scatter plot of the clusters has been provided, showing the distinct groupings formed using the K-Means algorithm. Centroids of each cluster are marked, and each color represents a different cluster.

