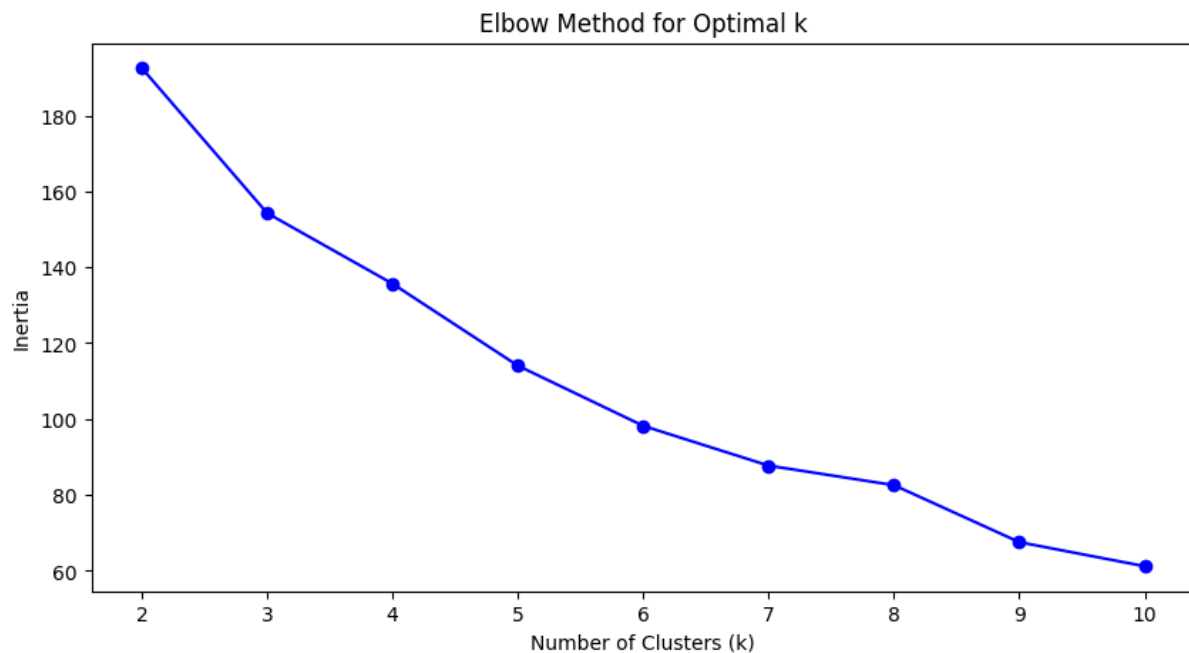


# Customer Segmentation / Clustering

This report summarizes the results of customer segmentation using the **K-Means clustering algorithm**. The goal was to group customers into distinct clusters based on their profile and transaction behavior. The clustering was evaluated using the **Davies-Bouldin Index (DB Index)** and other relevant metrics.

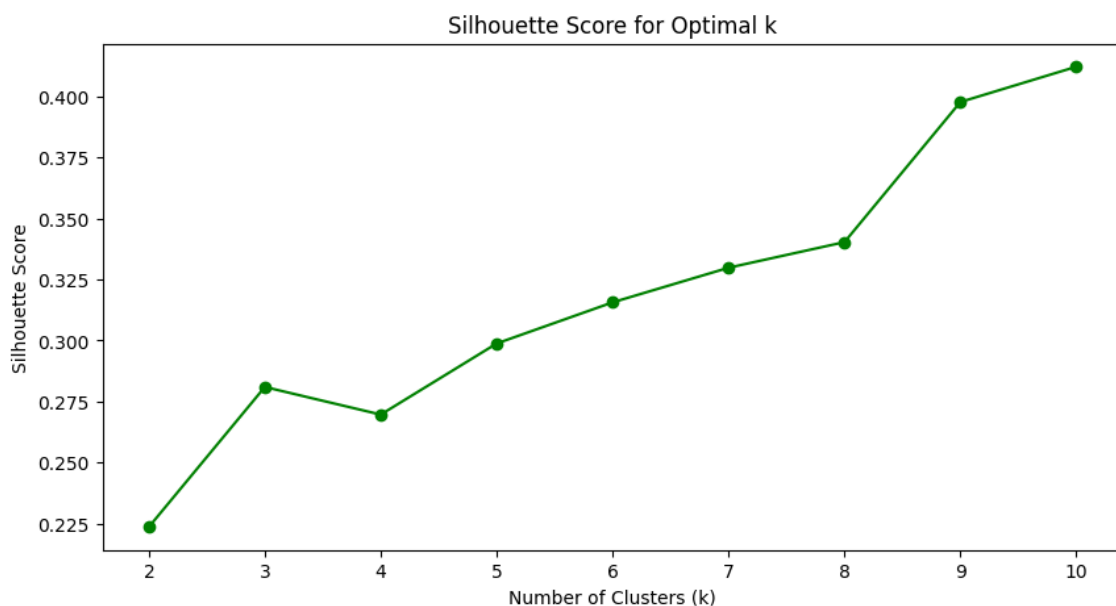
## Plots to Find Optimal value of K

### 1) Elbow method:



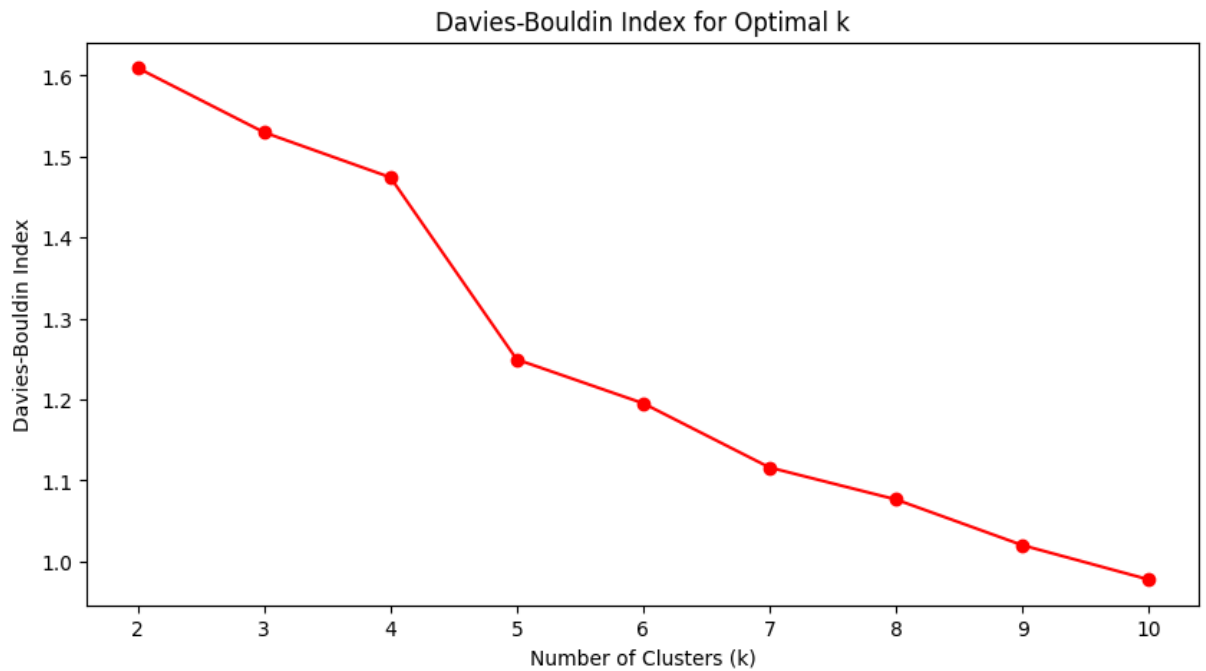
- Looking at the plot 4 and 5 looks more optimal for the k value.

### 2) Silhouette Score:



- Looking at the plot 10 looks more optimal for the k value as its approaching 1 and its closer towards 1 compared to other lower cluster values.

### 3) Silhouette Score:



- Looking at the plot 10 looks more optimal for the k value.

### Tabular values:

Clusters (K value)	Silhouette Score	Davies-Bouldin Index
2	0.2237	1.6095
3	0.2810	1.5300
4	0.2696	1.4744
5	0.2988	1.2495
6	0.3156	1.1954
7	0.3298	1.1161
8	0.3402	1.0766
9	0.3976	1.0202
10	0.4121	0.9777

Based on the Tabular values k = 10 is more optimal compared to other lower cluster levels as the Silhouette is score is approaching 1 and Davies-Bouldin Index is lower compared to other values.

**Visualize clusters using PCA (2D):**

