# Customer Segmentation Clustering Report

Overview: To segment customers effectively, we use RFM analysis, which evaluates customer value based on:

- Recency (R): Days since the last purchase, indicating engagement.
- Frequency (F): Number of transactions, reflecting loyalty.
- Monetary (M): Total spend, showing contribution to revenue.

Correlation Analysis: We analysed feature correlations to avoid multicollinearity and applied PCA to improve clustering efficiency and quality.

Optimal Cluster Determination: Using the Elbow and Silhouette methods, we identified the optimal number of clusters as k = 3.
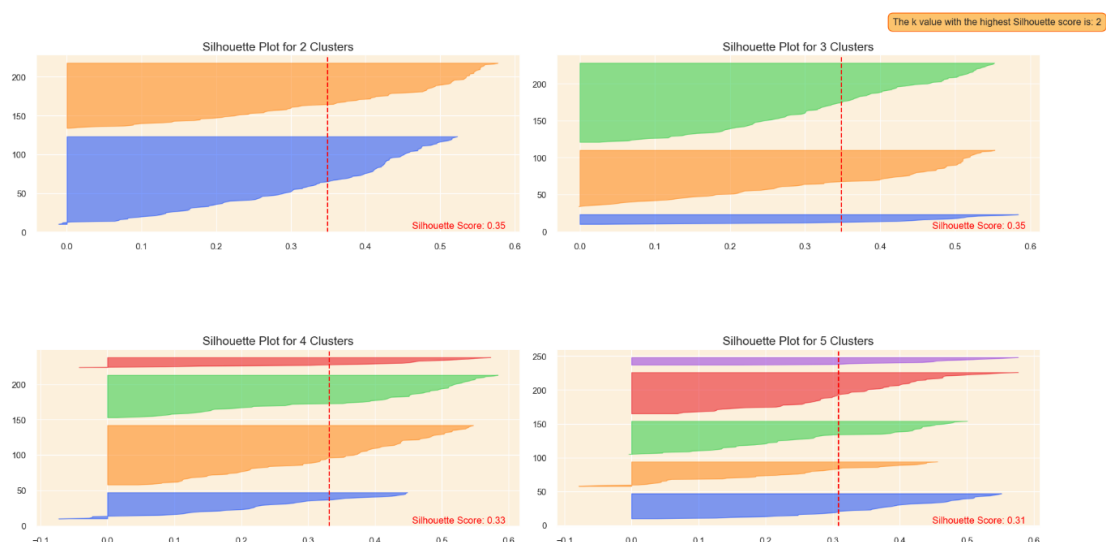
K-Means Clustering: We implemented K-Means to segment customers based on their purchasing behaviours, ensuring consistent labelling by frequency.

Evaluation Metrics:

Silhouette Score: 0.3487

Calinski-Harabasz Score: 119.14

Davies-Bouldin Score: 0.96

3D Visualization of Customer Clusters in PCA Space

Legend:
- Cluster 0
- Cluster 1
- Cluster 2

Axes: PC1, PC2