Clustering Results Report

This report presents the results of clustering analysis on customer data using K-Means with multiple
cluster configurations (3, 5, 7 clusters). Below are the key metrics and visualizations for each
configuration:

Results for 3 Clusters:
  K-Means: DB Index = 0.569, Silhouette Score = 0.532
  Hierarchical: DB Index = 0.583, Silhouette Score = 0.509
  GMM: DB Index = 0.630, Silhouette Score = 0.418

Results for 5 Clusters:
  K-Means: DB Index = 0.525, Silhouette Score = 0.537
  Hierarchical: DB Index = 0.535, Silhouette Score = 0.530
  GMM: DB Index = 6.471, Silhouette Score = 0.274
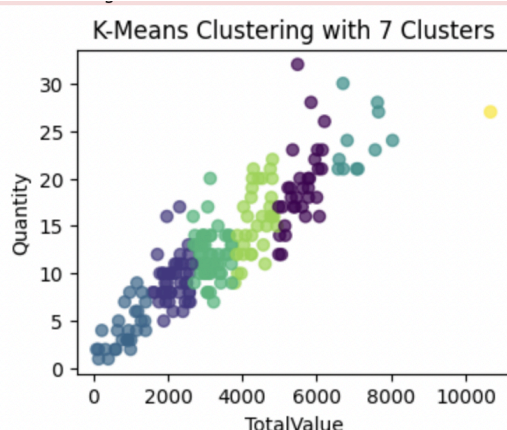
Results for 7 Clusters:
  K-Means: DB Index = 0.449, Silhouette Score = 0.549
  Hierarchical: DB Index = 0.436, Silhouette Score = 0.535
  GMM: DB Index = 0.530, Silhouette Score = 0.459

From this results we can say that the K-Means with 7 clusters is identified as the
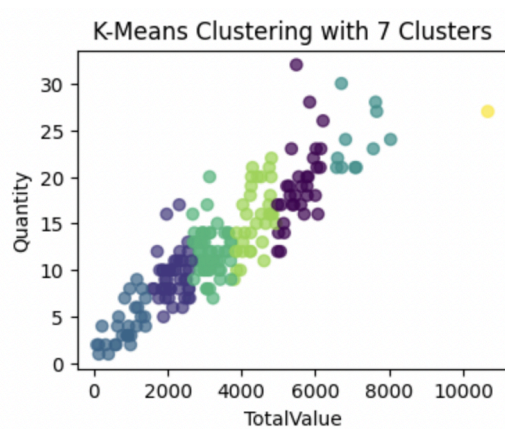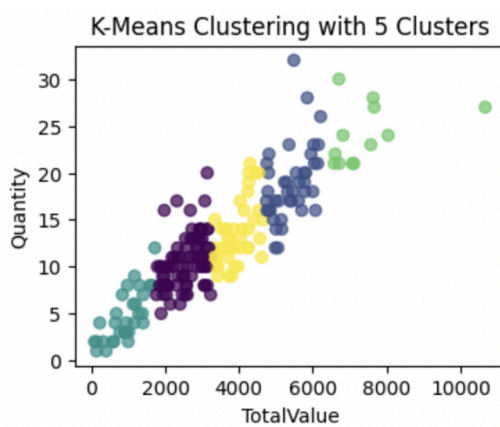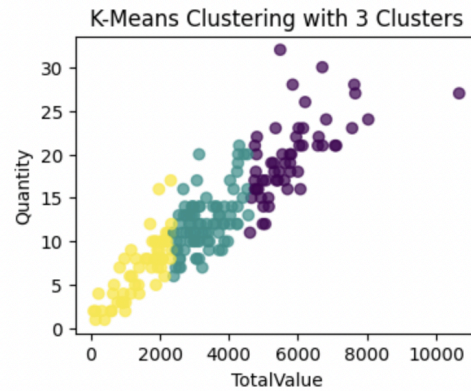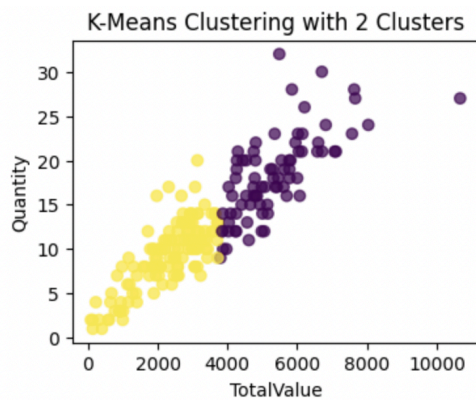best-performing configuration.

Cluster Visualisation:

We are concluded K-means as best algo for this dataset according to DB-Index
DB Index : Indicates the compactness and separation of clusters. Lower values are
better.

And we have done analysis on different clusters and algo here are the Visualizations

K-means Algorithm with different n_clusters

GMM Algorithm with different n_clusters