

Title : Customer Segmentation Report

1.Introduction

This report presents the customer segmentation analysis performed on the eCommerce Transactions dataset.

The goal of segmentation is to group customers with similar characteristics to enable targeted marketing strategies.

Dataset Overview:

1. Customers.csv: Contains customer profiles such as ID, region, and signup date.
2. Transactions.csv: Provides transaction details, including total value and quantity.

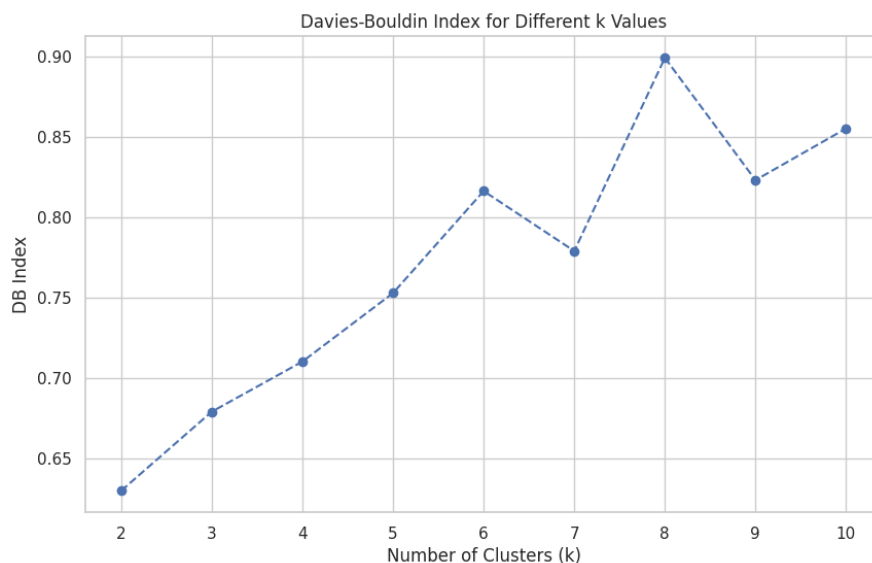
Clustering Technique:

KMeans clustering was applied to group customers into segments based on their transaction history. The optimal number of clusters was determined using the Davies-Bouldin Index.

2.Clustering Approach and Visualizations

2.1 Davies – Bouldin Index Plot

Visualizations:



Insight:

The Davies-Bouldin Index graph evaluates the quality of clustering for different numbers of clusters (k). A lower DB Index value indicates better clustering.

- X-axis (Number of Clusters, k): Ranges from 2 to 10.
- Y-axis (DB Index): Ranges from 0.65 to 0.90.
- Best Clustering: Achieved at $(k = 2)$ with the lowest DB Index.
- Increasing DB Index: Generally increases with more clusters, peaking at $(k = 8)$.

This helps identify the optimal number of clusters for better data grouping.

The DB Index analysis revealed that the optimal number of cluster is 4. This minimizes the index value, indicating compact and well-separated clusters.

2.2 Customer Segmentation Clusters

Visualization:



Insight:

The scatter plot visualizes customer segments based on Total Value and Quantity. Each cluster represents a group of customers with similar purchasing behaviors.

3. Key Findings

1. Cluster 1: High spenders with large quantities purchased. This group is the most valuable segment and should be prioritized for loyalty programs.
2. Cluster 2: Medium spenders with moderate quantities. These customers can be targeted with upsell campaigns.
3. Cluster 3: Low spenders with small quantities. Marketing strategies should aim to increase their spending.
4. Cluster 4: Irregular spenders with unpredictable behavior. Personalized offers might help in retaining these customers.

4. Conclusion

The clustering analysis identified four distinct customer segments. Key insights include:

1. High spenders are the most valuable customers and should be the focus of retention strategies.
2. Marketing efforts can be tailored to each cluster based on their purchasing behavior.
3. Low spenders represent an opportunity for growth through targeted promotions.

5. Appendix

Preprocessing Steps:

1. Standardized numerical features (Total Value, Quantity) for clustering.
2. Evaluated clustering quality using Davies-Bouldin Index.
3. Visualized clusters using scatter plots for better interpretation.