Clustering : Customer Segmentation Report

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The Aim of this project was to segment customers into groups based on their purchasing behaviour and tenure using any clustering technique .after analysing my aim is to provide with customer groups that can help strategic marketing and customer retention .

The dataset were provided :

1. **Customers.csv**: Customer demographic and signup details.

2. **Products.csv**: Product categories and prices.

3. **Transactions.csv**: Purchase history of customers.

Clustering Results

Optimal Number of Clusters

The number of clusters was determined by evaluating the Davies-Bouldin Index (DB Index) across cluster counts from 2 to 10. The DB Index measures cluster compactness and separation, with lower values indicating better clustering quality.

- Optimal Number of Clusters: 4

- Lowest DB Index Value: 0.83

The chosen cluster count ensures meaningful segmentation with minimal overlap between clusters.

Observations

1. Cluster 2: Represents frequent buyers who contribute significantly to revenue.

2. Cluster 0: Includes loyal customers with a long tenure and consistent spending patterns.

3. Cluster 3: Comprises new or infrequent customers with low spending levels.
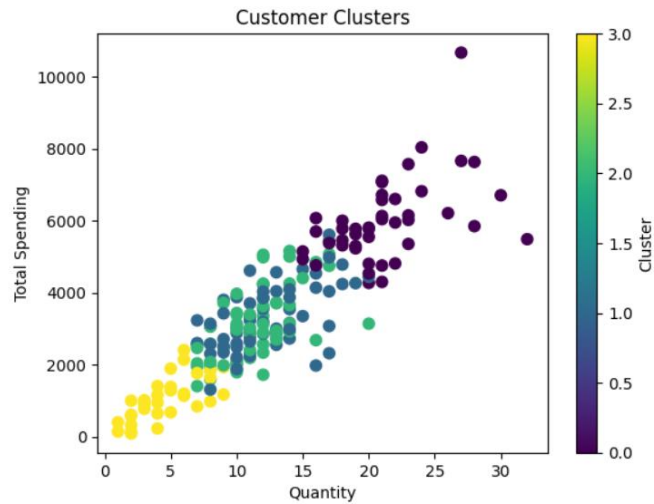
4. Cluster 1: Moderate buyers

Visualization

1. DB Index vs Number of Clusters

The graph below illustrates DB Index values for cluster counts from 2 to 10. The optimal cluster count (marked) minimizes the DB Index.
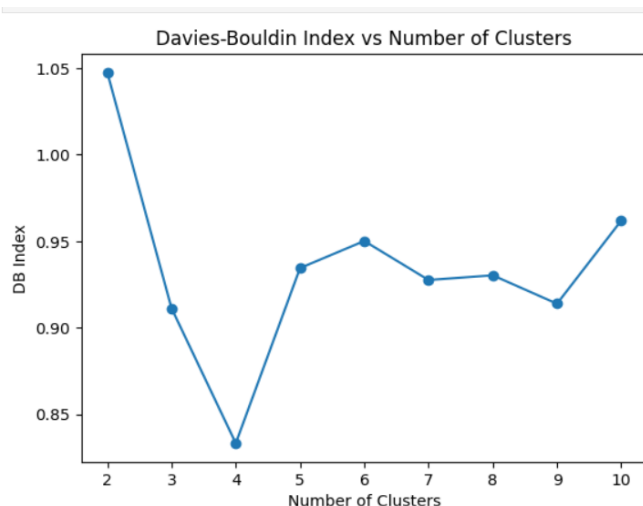
2. Scatterplot of Customer Clusters

The following scatterplot visualizes the clusters based on total spending and quantity purchased.

Customer Clusters

Conclusion

The clustering analysis successfully identified distinct customer groups with unique characteristics. These insights can be utilized for:

1. Marketing Campaigns: Focus on high-value customers in Cluster 2 for premium products.

2. Customer Retention: Enhance loyalty programs for Cluster 0 to sustain engagement.

3. Upselling Opportunities: Target Cluster 3 with promotions to increase spending.