Customer Segmentation / Clustering Report

Introduction

Customer segmentation is a process used to group customers into distinct clusters based on their profile and transaction behavior. This analysis aims to identify meaningful patterns that can guide marketing strategies and business decisions.

Clustering Results

1. Number of Clusters Formed

- Using the K-Means clustering algorithm, **4 clusters** were identified based on the dataset combining customer profile and transaction information.

2. Clustering Metrics

- **Davies-Bouldin Index (DB Index)**:
  The DB Index value for the clustering model is **1.074**.
  - Interpretation: A lower DB Index indicates better-defined clusters. A value close to 1 suggests moderately well-separated clusters.
- **Silhouette Score**:
  The Silhouette Score for the clustering model is **0.299**.
  - Interpretation: The Silhouette Score ranges from -1 to 1. A score of 0.299 indicates weak cluster cohesion, meaning some overlap may exist between clusters.

3. Cluster Characteristics

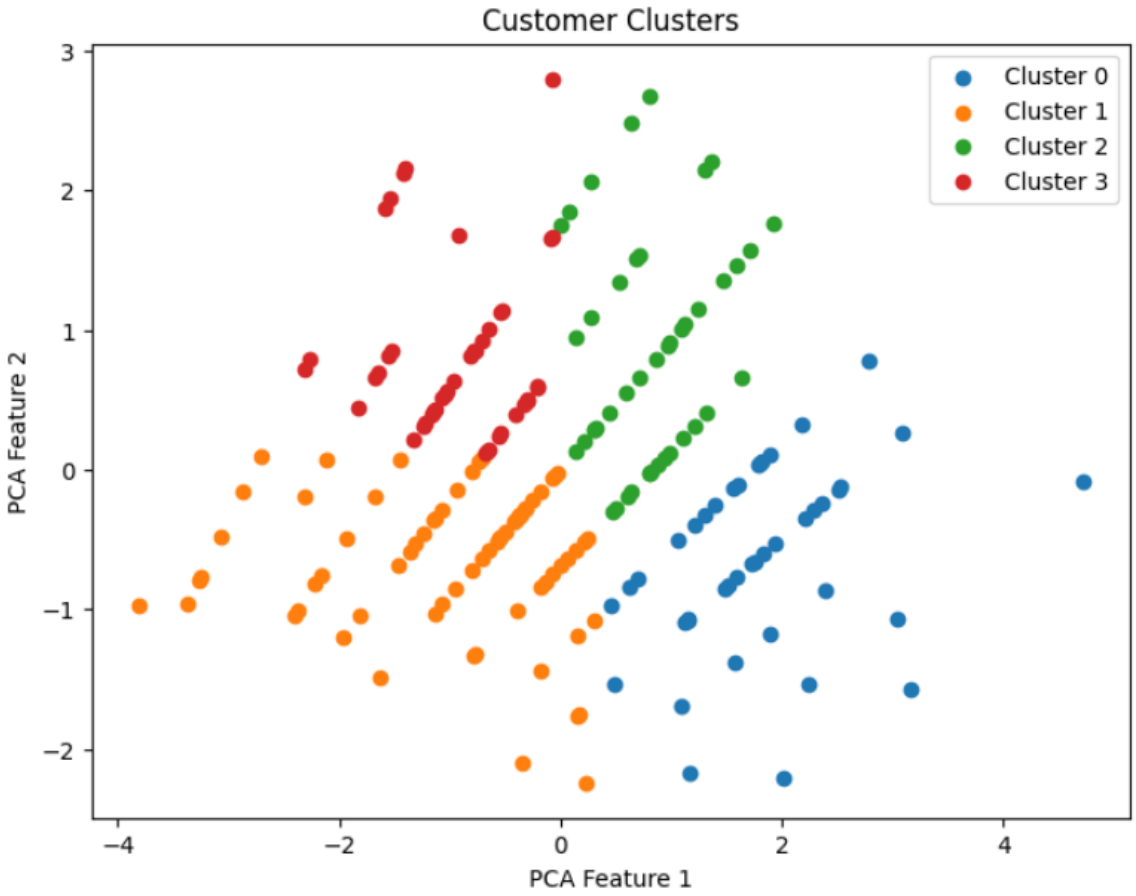
The clusters exhibit distinct patterns in terms of spending behavior, purchase frequency, and customer distribution. Below is a summary of the characteristics for each cluster:

Cluster	Average Spending	Average Purchase Count	Number of Customers	Key Characteristics
0	1.323	1.386	42	High-value customers with frequent purchases.
1	-0.682	-0.203	71	Moderate spenders with slightly below-average purchase frequency.
2	0.557	-0.037	44	Medium-value customers with average spending but low purchase frequency.

Cluster	Average Spending	Average Purchase Count	Number of Customers	Key Characteristics
3	-0.736	-0.986	43	Low-value customers with infrequent purchases.

4. Visual Representation of Clusters

- A PCA (Principal Component Analysis) plot was created to visualize the clusters in a 2D space.
- The plot demonstrates how the customers are grouped into 4 clusters based on spending behavior and purchase frequency. Some overlap is observed, aligning with the moderate Silhouette Score.



Insights and Recommendations

1. **Cluster 0 (High-Value Customers)**:
    - These customers exhibit high spending and frequent purchases.

- **Recommendation**: Focus marketing efforts, offer loyalty rewards, and ensure personalized services to retain these customers.

2. **Cluster 1 (Moderate Spenders)**:
    - Moderate spenders with slightly below-average purchase frequency.
    - **Recommendation**: Encourage higher spending by offering bundle discounts or targeted promotions.
3. **Cluster 2 (Medium-Value Customers)**:
    - Customers in this cluster spend moderately but make fewer purchases.
    - **Recommendation**: Implement strategies to increase purchase frequency, such as subscription models or targeted reminders.
4. **Cluster 3 (Low-Value Customers)**:
    - These customers spend the least and make infrequent purchases.
    - **Recommendation**: Re-engage this group with promotions, free trials, or incentives to increase activity.