Customer Segmentation Report

1. Introduction

This report outlines the customer segmentation process performed using clustering techniques. The objective is to group customers into meaningful segments based on purchasing behavior and total spending.

2. Methodology

- Used KMeans clustering with 5 clusters.

- Features considered: TotalValue (Total Spending) and Quantity (Number of Items Purchased).

- Data was standardized using StandardScaler to ensure fair clustering.

- PCA was applied to visualize clusters.

- Additional metrics: Davies-Bouldin Index, Inertia (Sum of Squared Distances), and Silhouette Score were considered for cluster evaluation.

3. Results and Evaluation

- **Number of Clusters:** 5

- **Davies-Bouldin Index:** 0.75

- **Silhouette Score:** 0.52

- **Cluster Insights:**

    o   Cluster 1: High spenders with frequent purchases.

    o   Cluster 2: Moderate spenders with varied purchase patterns.

    o   Cluster 3: Low spenders with infrequent purchases.

    o   Cluster 4: Occasional high-value buyers.

    o   Cluster 5: Customers with minimal transactions.

4. Visualization and Business Strategy

- **Cluster Visualization:** PCA-based 2D scatter plot was used to represent customer segments.

- **Cluster Distribution:** Pie charts and bar plots showed the percentage of customers in each segment.

- **Actionable Recommendations:**

    o   Target high spenders (Cluster 1) with premium offers.

    o   Engage moderate spenders (Cluster 2) with loyalty programs.

    o   Encourage low spenders (Cluster 3 & 5) with personalized discounts.

    o   Identify potential high-value customers from Cluster 4 for upselling.