Customer Segmentation Clustering Report

1. Number of Clusters Formed

The optimal number of clusters was determined using the **Elbow Method** and set to **3** clusters. The **K-Means clustering algorithm** was used to segment the customers effectively.

2. Davies-Bouldin Index (DBI) Value

The calculated **Davies-Bouldin Index (DBI) is 0.702**, indicating **well-separated and compact clusters**. A DBI below 1.0 suggests that the clustering is effective.

3. Other Clustering Metrics

- **Inertia (Sum of Squared Errors - SSE):** Used to validate the compactness of clusters.

- **Silhouette Score:** Measures how similar each data point is to its own cluster versus other clusters.

- **Cluster Sizes:**

    o Cluster 0: XX customers

    o Cluster 1: XX customers

    o Cluster 2: XX customers

4. Cluster Characteristics & Insights

Cluster 0: High-Value Customers

- Customers who made frequent transactions with high total spending.

- Likely to be loyal, high-spending customers.

- Could be targeted with **premium offers and loyalty programs**.

Cluster 1: Moderate Buyers

- Customers with moderate purchase frequency and spending.

- Occasional buyers who may respond to **discounts and seasonal promotions**.

Cluster 2: Low-Value or One-Time Buyers

- Customers with minimal purchases and low total spending.

- May need **retargeting strategies** to improve engagement.

5. Visualization Summary

- **Elbow Plot:** Shows the optimal number of clusters.

- **Cluster Scatter Plot:** Visualizes how clusters are distributed based on Quantity and TotalValue.

- **Distribution Plots:** Show the spending behavior of different clusters.

Elbow Method for Optimal K

Customer Segmentation (K=3)