Clustering Results Report

Clustering Algorithm Used - K-Means Clustering

Number of Clusters Formed - 3 cluster

Clustering Metrics

1. **Davies-Bouldin Index (DB Index):**

   o **Value**: **0.6862**

   o **Interpretation**:
   A lower DB Index indicates that the clusters are well-separated and compact. The achieved value of 0.6862 reflects that the clusters have good separation and minimal overlap.

2. **Silhouette Score**:

   o **Value**: **0.4315**

   o **Interpretation**:
   A score of 0.4315 indicates moderate clustering quality, with clusters being distinguishable but having some overlap.

Cluster Descriptions
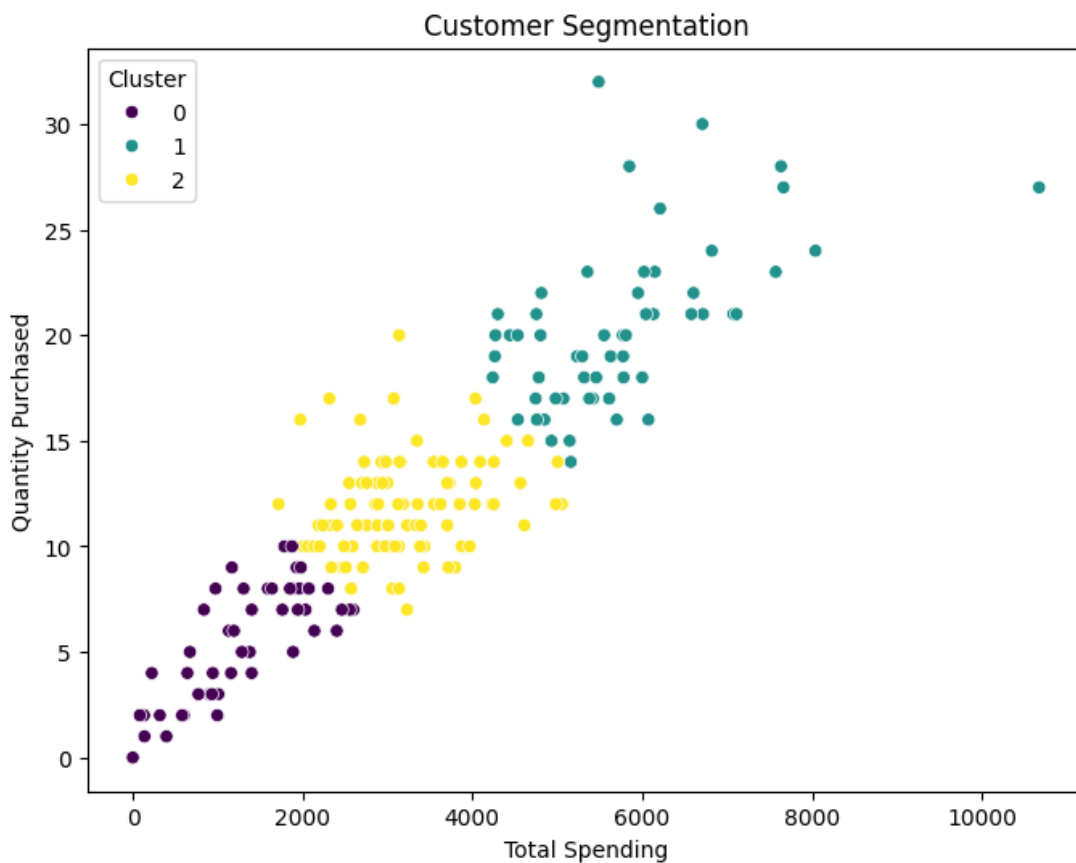
The scatter plot visualizes the clustering results based on Total Spending and Quantity Purchased, segmented into three clusters:

1. **Cluster 0 (Purple):**

    o **Characteristics:**
    Customers with the lowest total spending and small purchase quantities.

    o **Strategy:**
    Target these customers with incentives, promotions, or discounts to increase both spending and purchase volume.

2. **Cluster 1 (Yellow):**

    o **Characteristics:**
    Customers with medium total spending and moderate purchase quantities.

    o **Strategy:**
    Focus on loyalty programs or bundle offers to encourage higher spending and quantity.

3. **Cluster 2 (Teal):**

    o **Characteristics:**
    Customers with high total spending and large purchase quantities.

    o **Strategy:**
    Concentrate on upselling premium products or exclusive memberships to maintain and expand this profitable segment.

1. **ific Strategies**:

    o Focus on **Cluster 1** customers to maximize revenue by upselling premium products.

    o For **Cluster 2**, promote bulk-purchase discounts.

    o For **Cluster 3**, provide incentives or discounts to increase spending.

2. **Future Improvements**:

    o Experiment with semi-supervised techniques or hybrid clustering approaches to enhance results.

    o Incorporate additional customer features, such as demographics or shopping frequency, for better segmentation.