Task 3 : Customer Segmentation Clustering Report

1. Number of Clusters Formed:

The optimal number of clusters, determined using the Davies-Bouldin Index, is **2**. This means the data was segmented into **2 distinct customer groups**.

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2. Clustering Metrics:

- **Davies-Bouldin Index (DB Index):**
  The DB Index value for the optimal clustering (k = 2) was **<value derived from execution>**.
  Lower DB Index values indicate better cluster separability and compactness.
- **Cluster Centroids:**
  The centroids of the two clusters (representing the average characteristics of each group) are as follows:

Cluster	Total Spent	Total Quantity	Transaction Count
0	5155.752532	18.721519	7.113924
1	2355.759250	8.816667	3.650000

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3. Other Observations:

- **Cluster Characteristics:**
  - **Cluster 0:** Includes customers with lower spending, fewer items purchased, and fewer transactions.
  - **Cluster 1:** Includes high-value customers with higher spending, larger quantities, and more frequent transactions.
- **Data Standardization:**
  Standardization was applied to the numerical features (TotalSpent, TotalQuantity, TransactionCount) to ensure fair scaling before clustering.
- **Visualization:**
  The pair plots highlighted distinct separability between the clusters, particularly in terms of spending and transaction frequency.