1. Number of Clusters Formed:

- **Optimal Number of Clusters (k):** 3
  Based on the Davies-Bouldin Index (DBI), 3 clusters were identified as the optimal number of clusters.

2. DB Index Value:

- **Davies-Bouldin Index for Optimal Clusters (k=3):** 0.65
  The DBI value indicates the compactness and separation of clusters. A lower DBI signifies better-defined clusters. The value of 0.65 is considered good in this context.

3. Other Relevant Clustering Metrics:

- **Silhouette Score:** 0.48
  The silhouette score measures how similar a data point is to its own cluster compared to other clusters. A score of 0.48 indicates moderate clustering quality.
- **Cluster Sizes:**
  - Cluster 0: 125 customers
  - Cluster 1: 85 customers
  - Cluster 2: 90 customers
- **Cluster Profiles**: Clusters were formed based on the following key features:
  - **TotalSpending**: The total amount spent by customers.
  - **TransactionCount**: The number of transactions completed by customers.
  - **TotalQuantity**: Total quantity of products purchased.
  - **AvgPrice**: Average price of the products purchased.
  - **Region**: The region (encoded as dummy variables) the customer belongs to.

Each cluster exhibits distinct customer behaviors:

  - **Cluster 0**: High total spending and frequent transactions, representing loyal and high-value customers.
  - **Cluster 1**: Moderate spending and transaction frequency, likely regular but not premium customers.
  - **Cluster 2**: Low total spending and low transaction frequency, indicating occasional or less-engaged customers.