The segmentation was performed using data aggregated from **Transactions** and **Customers** datasets.

Data Preparation

1. Aggregated the data to create a customer profile for each customer.
2. Converted categorical data (Region) to numerical values using one-hot encoding.
3. Standardized all numerical features using StandardScaler to ensure equal contribution to clustering.

Clustering Algorithm

- Used the KMeans clustering algorithm to partition the customers into 4 clusters.
- Chose 4 clusters based on experimentation and evaluation metrics.

Evaluation Metrics

- **Davies-Bouldin Index**: 1.20

  Indicates moderate clustering quality. Clusters are somewhat distinct but not completely well-separated.

- **Silhouette Score**: 0.33

  Suggests moderate overlap between clusters. There is room for improvement in distinguishing cluster boundaries.

Cluster Summary

Each cluster represents a unique segment of customers:

Cluster	Description	Key Characteristics
0	Low-Spending Customers	Low total spending and few products purchased. Likely budget-conscious or infrequent buyers.
1	High-Value, Loyal Customers	High total spending and frequent purchases. Likely long-term, valuable customers.
2	New or Infrequent Customers	Medium spending and purchase volume. Recent signups or occasional buyers.
3	Regional/Moderate Spenders	Moderate spending and balanced purchase behavior. May reflect regional buying patterns or steady buyers.