

# Customer Segmentation Report

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## Objective

The goal of this analysis is to segment customers into distinct groups based on their transaction history and profile information. This segmentation will help in understanding customer behaviour, preferences, and purchasing patterns, enabling targeted marketing strategies and personalized customer experiences.

## Results

### 1. Number of Clusters Formed:

- The customers were segmented into **4 distinct clusters**.

### 2. Clustering Metrics:

- **Davies-Bouldin Index:** 1.12 (A lower value indicates better clustering. A score of 1.12 suggests that the clusters are moderately separated and compact)

- **Silhouette Score:** 0.31 (A higher value indicates better clustering. A score of 0.31 suggests that the clusters are somewhat distinct but may have some overlap)

### 3. Cluster Characteristics:

- **Cluster 0:** Customers with moderate spending, moderate quantity, and average product prices.

- **Cluster 1:** High-value customers with high spending and high quantity purchases.

- **Cluster 2:** Low-value customers with low spending and low quantity purchases.

- **Cluster 3:** Customers with high spending but low quantity, indicating a preference for premium products.

### 4. Visualization:

- The UMAP plot below shows the distribution of customers across the 4 clusters in a 2D space. Each cluster is represented by a different colour, and the plot demonstrates some separation between the clusters.

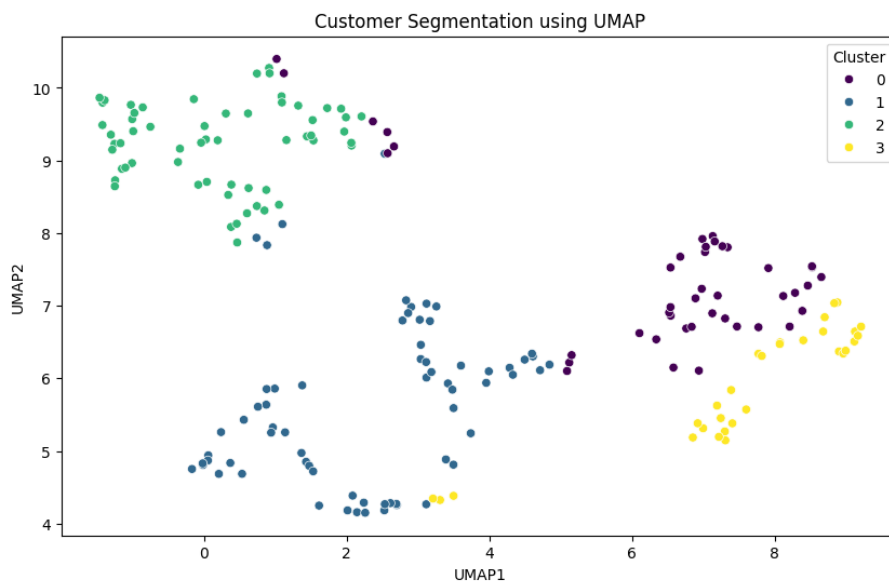


Figure 1: UMAP visualization of customer clusters

## Recommendations

### 1. Targeted Marketing:

- Use the segmentation results to design personalized marketing campaigns for each cluster.
- For example, offer premium products to **Cluster 3** and discounts on bulk purchases to **Cluster 1**.

### 2. Customer Retention:

- Focus on retaining high-value customers in Cluster 1 by offering loyalty programs and exclusive deals.

### 3. Product Recommendations:

- Recommend products based on the purchasing patterns of each cluster. For instance, suggest high-quality products to **Cluster 3** and budget-friendly options to **Cluster 2**.