

## Customer Segmentation Report

### Number of Clusters Obtained

After applying K-Means clustering with 7 clusters, the customers were grouped into different groups based on their spending habits, transaction counts, and regional attributes.

### Clustering Metrics

- 1.Davies-Bouldin (DB) Index:** The **DB Index** for the clustering solution is 0.97. A lower DB Index shows better separation and compactness of clusters.
- 2. Silhouette Score:** The average **silhouette score** is 0.36 .Silhouette score gives a measure of how much a point is similar to its cluster than other clusters, where higher values near 1 signify well-defined clusters.

### Cluster Characteristics

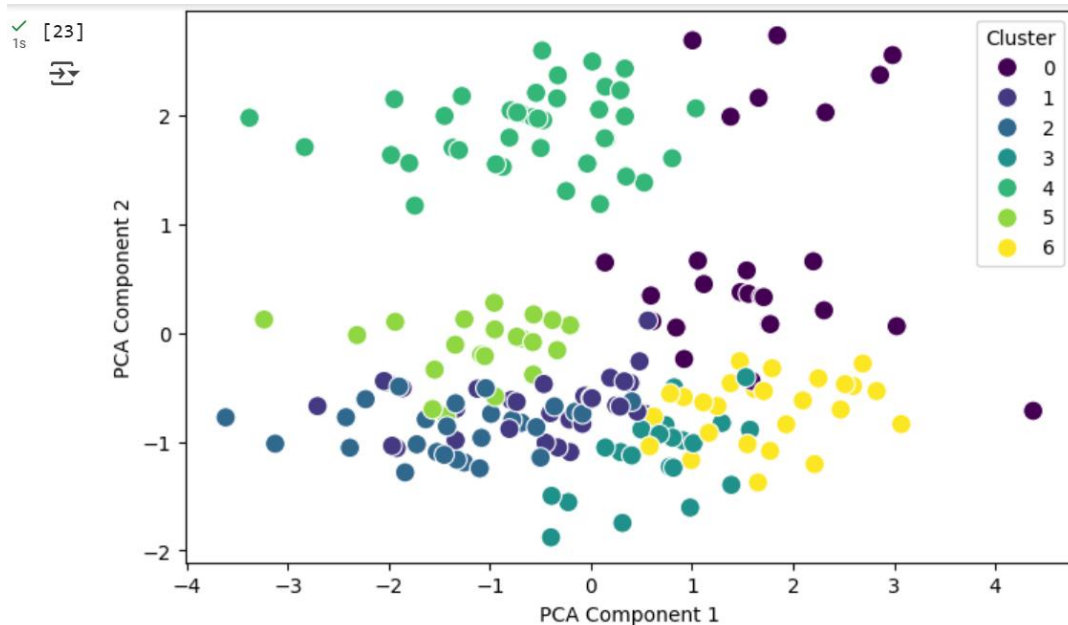
Each cluster has unique characteristics based on customer behavior. Below is a summary of the clusters:

Cluster	Description
Cluster 0	High spenders, frequent transactions, mostly from Region A.
Cluster 1	Moderate spenders with medium transaction frequency.
Cluster 2	Low spenders with infrequent transactions, from Region B.
Cluster 3	Customers with high average spend per transaction.
Cluster 4	Region-focused group with specific spending patterns.
Cluster 5	High transaction counts but low total spending.
Cluster 6	Mixed spenders with varying transaction behaviors.

### Visualization

Using PCA (Principal Component Analysis) to reduce dimensions, the clusters were visualized as follows:

- The clusters are well-separated, with minimal overlap in the PCA-reduced space.
- Color coding clearly highlights differences in customer segments.



## Insights and Recommendations

### 1.Targeted Marketing Campaigns:

- High spenders (Cluster 0) should be rewarded with premium loyalty rewards and exclusive offers.
- Low spenders (Cluster 2) can be motivated through discounts or personalized deals to increase engagement.

### 2.Region-Specific Strategies:

- Some clusters have strong regional attributes. Tailor marketing campaigns according to geographic preferences.

### 3.Focus on Retention:

- For customers with high transaction frequency but low spending (Cluster 5), analyze products/services purchased and explore opportunities to upsell or cross-sell.

### 4.Product Recommendations:

- Use insights from each cluster to fine-tune product recommendations on your platform.