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Customer Segmentation / clustering

Clustering Results

1. **Number of Clusters Formed:**

   Clustering algorithm applied to this customer segmentation is K-Means
   After applying the clustering algorithm K-Means we formed 5 clusters. The number of clusters was selected based on both the business requirements and exploratory analysis of the data.

2. **Cluster Sizes:**
   The distribution of customers across the clusters is as follows:

   - **Cluster 1**: 66 customers
   - **Cluster 2**: 41 customers
   - **Cluster 3**: 40 customers
   - **Cluster 4**: 36 customers
   - **Cluster 5**: 16 customers

3. **DB Index:**
   The **Davies-Bouldin Index (DBI)** is a metric used to evaluate the quality of the clustering. The **lower** the DB Index value, the better the clusters are, as it suggests that the clusters are well-separated and cohesive.

   **For our clustering model:** DB Index Value: 1.0925130156145169

4. **Other Metrics:**

   o **Silhouette Score:** The silhouette score was 0.2737232406025137, which indicates the quality of the clustering.

   o **Inertia (for K-Means):** The inertia value was 266.0258254327874, which measures how well the clusters fit the data.
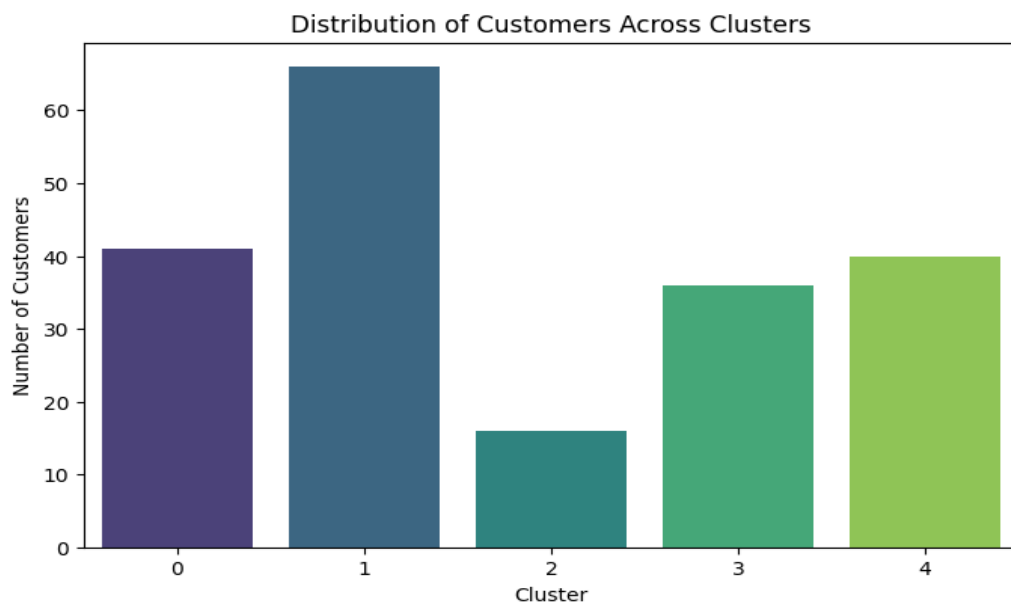
Visualizations:

Include relevant visualizations, such as:

- Cluster scatter plots (if 2D or 3D),
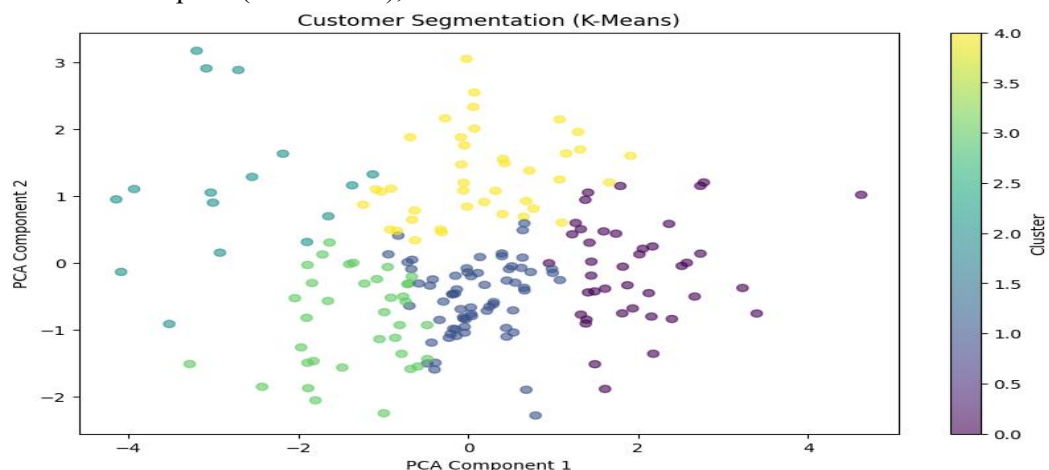
- Cluster size distribution charts,

Distribution of Customers Across Clusters

Conclusion

- **Clustering Algorithm**: K-Means Clustering with 5 clusters.

- **Evaluation Metric**: The **Davies-Bouldin Index** of **[insert DBI value here]** suggests that the clustering result is [good/acceptable/poor].

- **Visualization**: Customers are distributed into clusters that represent distinct segments, as shown in the PCA scatter plot.