

Clustering Report

- ❖ Used the 'Customer_Features.csv' dataset to perform clustering.
 - This dataset includes:
 - Customer's Total Spend,
 - Their total Transaction Count,
 - Unique Products and Categories they bought,
 - Their tenure and,
 - Region of the customer
- ❖ Performed Kmeans clustering initially with 3 clusters, having silhouette score of 0.42146821989799116.
- ❖ Performed same step with 4 and 5 clusters and got silhouette score of 0.5433118483313173 and 0.48146737349400565 respectively.
- ❖ Plot the silhouette score along with Inertia (Elbow Method) for more clarity.
- ❖ Also, calculated DB Index value. N (Number of clusters) = 4 having the lowest DB index value of 0.7701272895221076.
- ❖ K = 4 has been chosen as the best number of clusters.
- ❖ Performed Kmeans clustering with K = 4. Customers have been divided into 4 groups based on their behavior or characteristics:
 - ◆ Cluster 1 has 59 customers
 - ◆ Cluster 0 has 50 customers
 - ◆ Cluster 2 has 46 customers
 - ◆ Cluster 3 has 44 customers
- ❖ Grouped by clusters and calculated mean and median for each feature. This is the output:

KMeans_Cluster	Total_Spend (Mean)	Total_Spend (Median)	Transaction_Count (Mean)	Transaction_Count (Median)
0	0.306163	0.285533	0.368000	0.40
1	0.343245	0.316519	0.415254	0.40
2	0.304848	0.278700	0.430435	0.40
3	0.318547	0.276661	0.395455	0.35

- **Cluster 1:**
 - Customers in this cluster have the highest average spending (mean = 0.343).
 - Their transaction count is slightly above average (mean = 0.415).
- **Cluster 2:**
 - Customers here spend the least on average (mean = 0.304).
 - However, they have the highest transaction count (mean = 0.430), indicating they make frequent but low-value purchases.
- **Cluster 3:**
 - Spending is moderate (mean = 0.318), but the median transaction count is the lowest (median = 0.35).
 - These customers are less engaged in terms of transactions.

- **Cluster 0:**
 - Spending is on the lower side (mean = 0.306), with an average transaction count (mean = 0.368).

❖ **Insights:**

- **Cluster 1 (High Spenders):** Focus on loyalty programs or exclusive deals to retain them.
- **Cluster 2 (Frequent Buyers):** Offer volume-based discounts or membership benefits to encourage continued purchases.
- **Cluster 3 (Moderate Buyers):** Re-engage with targeted offers or reminders to increase their transaction frequency.
- **Cluster 0 (Low Spenders):** Focus on onboarding campaigns or introductory discounts.