**TASK 3**

**Clustering Evaluation Metrics used are:**

The **DB Index** (Davies-Bouldin Index) evaluates the separation between clusters. A lower value indicates better clustering.

The **Silhouette Score** evaluates the cohesion and separation of the clusters. A value close to 1 indicates well-separated clusters, while values near 0 indicate overlapping clusters.

**Inertia** measures the compactness of the clusters. Lower values are better.

**Report**

**Clustering Algorithm:** We used **K-Means Clustering** to perform customer segmentation.

**Number of Clusters:** Based on the evaluation metrics (DB Index and Silhouette Score), the optimal number of clusters was determined as follows:

The optimal number of clusters based on the **DB Index** was **8**, with a DB Index of **0.6441**, indicating good separation between clusters.

The optimal number of clusters based on the **Silhouette Score** was **10**, with a Silhouette Score of **0.5223**, suggesting that the clusters are well-separated and cohesive.

The optimal number of clusters based on **Inertia** was **10**, with an Inertia of **213.3247**, showing that the clusters are relatively compact.