

The clustering analysis was conducted for cluster sizes ranging from 2 to 10. Based on the Davies-Bouldin Index (DB Index), the following were the results:

Optimal Number of Clusters: 2, Additional cluster counts were analyzed for  $k = 3$  to 10 to observe the trend in clustering quality.

The DB Index values for different numbers of clusters are as follows:-

$k=2$ , DB Index=0.9980

$k=3$ , DB Index=1.2033

$k=4$ , DB Index=1.3151

$k=5$ , DB Index=1.3571

$k=6$ , DB Index=1.3236

$k=7$ , DB Index=1.3620

$k=8$ , DB Index=1.2599

$k=9$ , DB Index=1.1199

$k=10$ , DB Index=1.0631

Key Insights were, that the DB Index was lowest at  $k = 2$ , suggesting that clustering into two groups produced the most compact and well-separated clusters. As the number of clusters increases beyond 2, the DB Index generally worsens (higher values), except for slight improvements at  $k = 8$  and  $k = 9$ .