

TASK 3

Clustering Analysis Report

- **Number of Clusters:** 4 clusters (labeled 0 to 3 and represented in different colors).
- **Davies-Bouldin (DB) Index:** 1.2262 (indicating a moderate level of clustering compactness and separation).
- **Inertia Analysis:**
 - A significant drop in inertia from 2 to 3 clusters (550 to 450) suggests meaningful separation.
 - The elbow point is around 4-5 clusters, confirming the choice of 4 clusters as a reasonable balance.
 - After 6 clusters, diminishing returns in inertia reduction indicate that additional clusters do not significantly improve segmentation.

Observations

- The clusters are fairly well-separated visually, indicating a clear structure in the dataset.
- Some overlap is observed in the central region, suggesting that a few data points exhibit similarities across multiple clusters.
- The shapes and densities of the clusters vary, which may indicate differing characteristics among groups.