Ex3

The Elbow Method for KMeans clustering determines the optimal number of clusters by plotting the inertia (sum of squared distances of samples to their closest cluster center) against varying numbers of clusters and identifying the 'elbow point' where the inertia starts to decrease more slowly, indicating the optimal number of clusters.

A graph with a line and a number of clusters

Description automatically generated

The final log likelihood of -7.10 represents the logarithm of the likelihood that the observed data was generated by the trained Gaussian Mixture Model (GMM), indicating model fit and convergence quality.

KMeans Accuracy: 0.39, Adjusted Rand Index: 0.83

GMM Accuracy: 0.38, Adjusted Rand Index: 0.86

evaluating clustering results, KMeans and GMM show similar accuracy (0.39 vs. 0.38) but GMM achieves a slightly higher Adjusted Rand Index (0.86 vs. 0.83), indicating better agreement with true class labels despite comparable accuracy.

the clustering results

