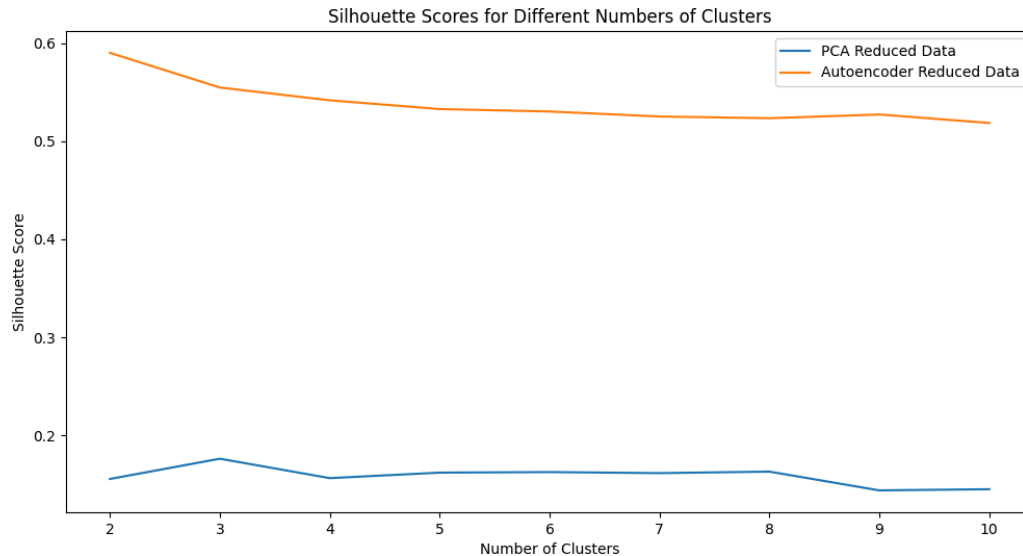# DAMA61 - Final Exam - Exercise 3

Output:

Optimal number of clusters for PCA reduced data: 3
Optimal number of clusters for Autoencoder reduced data: 2
Actual number of classes: 3

Comments:

PCA effectively reduced the data dimensionality while preserving most of the variance, which was crucial for maintaining the structure of the dataset. The autoencoder also reduced dimensionality but didn't perform as well in terms of preserving distinct classes based on the silhouette scores.

The silhouette scores for PCA-reduced data indicate that PCA preserved the class separability effectively, resulting in the correct number of clusters (3). In contrast, the autoencoder-reduced data suggested only 2 clusters, which may indicate some loss of information or class merging during the encoding process.

The silhouette score plot clearly shows that the PCA-reduced data consistently scores lower than the autoencoder-reduced data. However, the PCA results are more aligned with the actual number of classes, demonstrating that while the autoencoder achieved higher silhouette scores, it did not necessarily reflect the true class structure.