Q2-Dimensionality Reduction / Clustering

A) **Reducing Dimensions:** Put aside samples' labels. Use PCA to reduce dimensionality of the features based on the POV value. Repeat this process for 80%, 85%, 90%, and 95% rates respectively. Report dimensions for each POV value and train a model. Compare those results with results from Q1 Part A.

B) Put aside samples' labels. Apply **K-means**, **C-means, Fuzzy,** and **EM** algorithms. Compare new labels with original labels and report variations for each class separately. Then, consider clusters to be the same as the number of classes. Investigate how precise samples' labels are assigned.

C) Use agglomerative clustering (single-link and complete-link separately) and depict samples' Dendrogram. Then again, consider clusters to be the same as the number of classes, and compare new labels with original labels and report conflicts. Also report and rank the best achieved number of clusters based on all clustering methods used in B and C.