Question 2: Naive Bayes

1. **Multinomial and Complement Naive Bayes :**
   Since these two variants of Naive Bayes do not accept negative values, we perform MinMax standardization on the raw, PCA and LDA datasets and feed it to the classifiers.

2. **Gaussian Naive Bayes** :
   We instead use this variant of the Naive Bayes classifier to perform classification on the z-score normalized 6 datasets. The results obtained are as shown below: (all the reported scores are mean 5-fold cross-validation scores across all the folds)

TABLE I : Comparison of Accuracy Scores for Naive Bayes and KNN

DATASET	ACCURACY	VARIANT	KNN Accuracy
abalone-raw	22.07%	Gaussian	25.11%
abalone-pca	22.16%	Gaussian	25.83%
abalone-lda	23.3%	Gaussian	27.63
abalone-raw	16.66%	Multinomial	25.11%
abalone-pca	16.49%	Multinomial	25.83%
abalone-lda	16.5%	Multinomial	27.63
abalone-raw	14.74%	Complement	25.11%
abalone-pca	19.3%	Complement	25.83%
abalone-lda	23%	Complement	27.63
wine-raw	30.12%	Gaussian	68.31
wine-pca	44.99%	Gaussian	68.23
wine-lda	52.97%	Gaussian	68.54
wine-raw	41.5%	Multinomial	68.31
wine-pca	43.65%	Multinomial	68.23
wine-lda	43.6509%	Multinomial	68.54
wine-raw	36.95%	Complement	68.31
wine-pca	42.76%	Complement	68.23
wine-lda	42.45%	Complement	68.54

Comparison with KNN Accuracy :

KNN has performed significantly better than Naive Bayes for the wine dataset. In the case of abalone dataset, KNN has still performed better, but the difference is not that much.