CS5691: Pattern Recognition and Machine Learning

Assignment #4

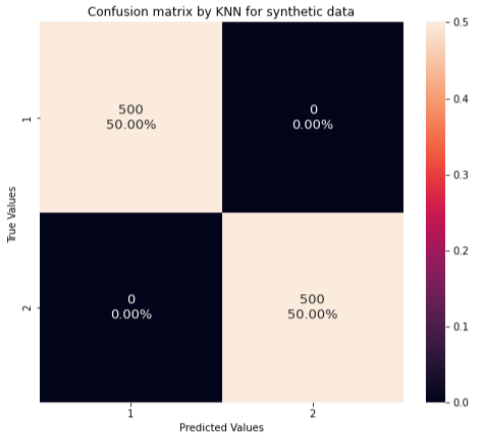
Team 34

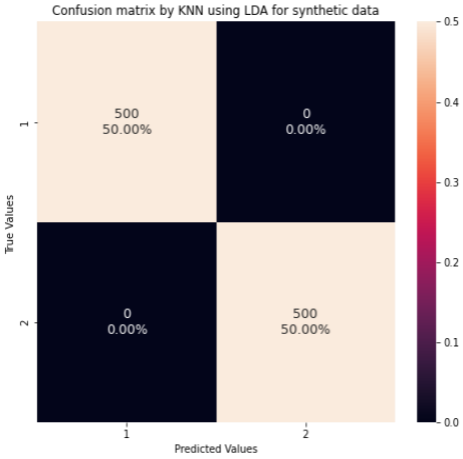
M Jaswanth Kumar, ED19B017 and Nitin Yadav, AM20M004

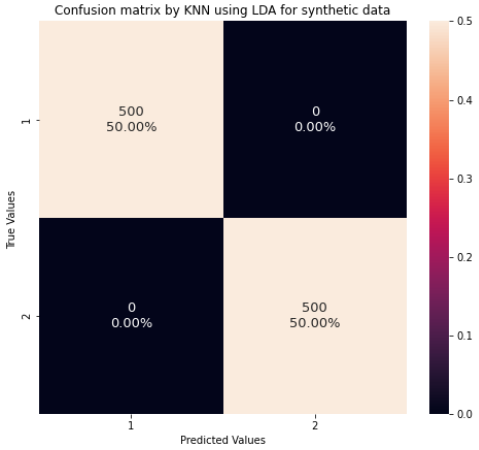
---

1) Synthetic Data set

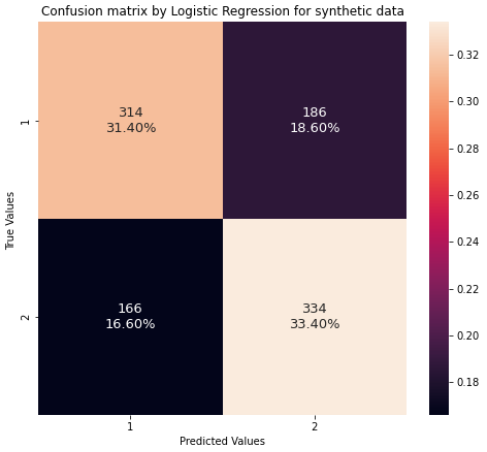
1.1 K-Nearest Neighbor

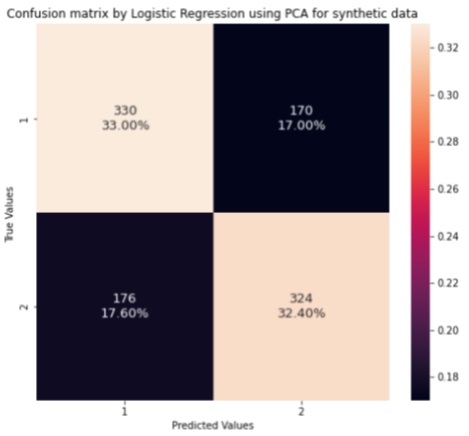


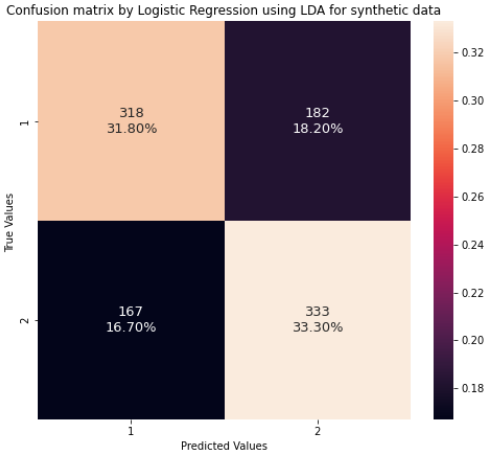




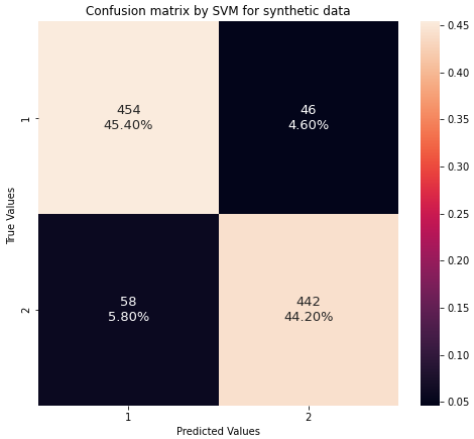
1.2 Logistic regression

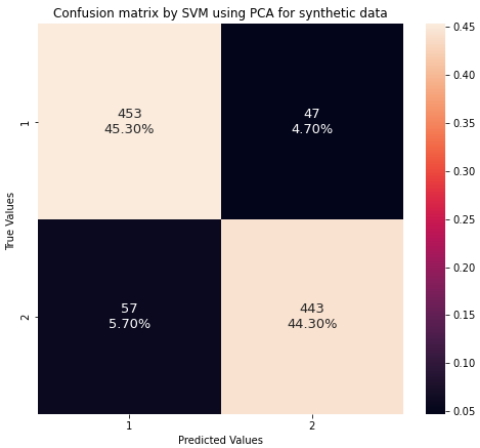


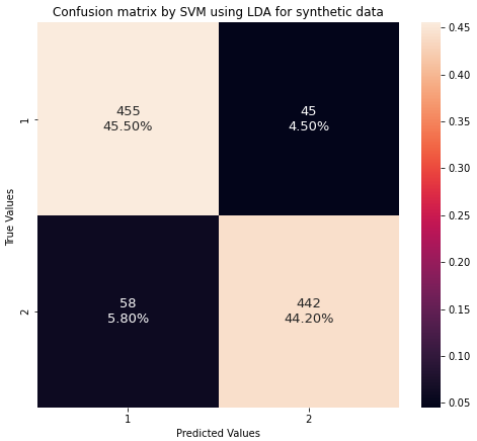




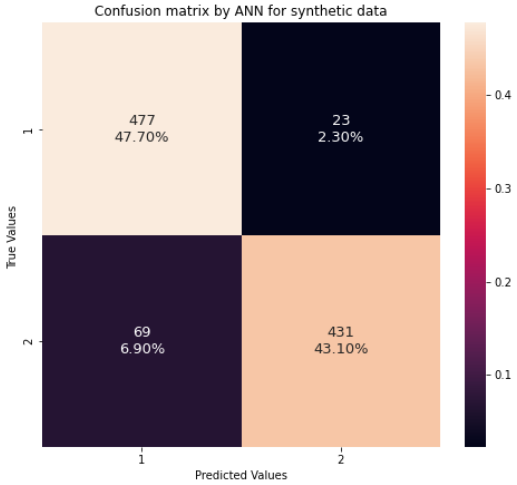
1.3 Support Vector Machines

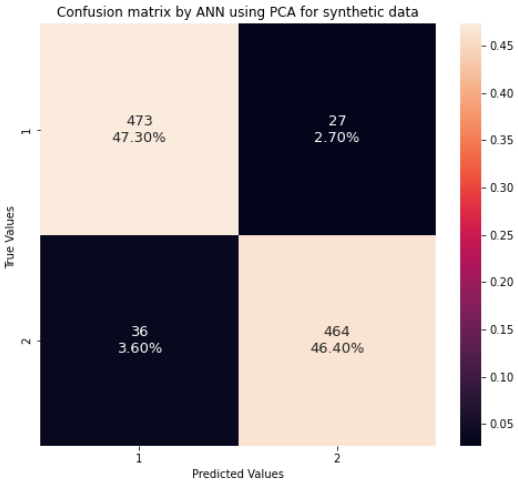


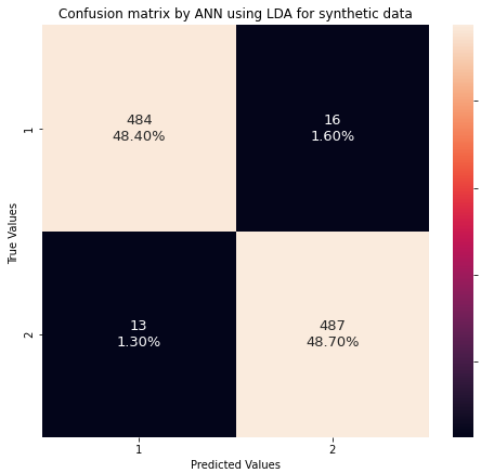




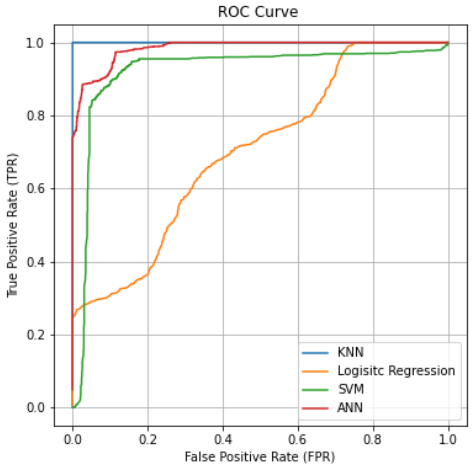
1.4 Artificial Neural Network

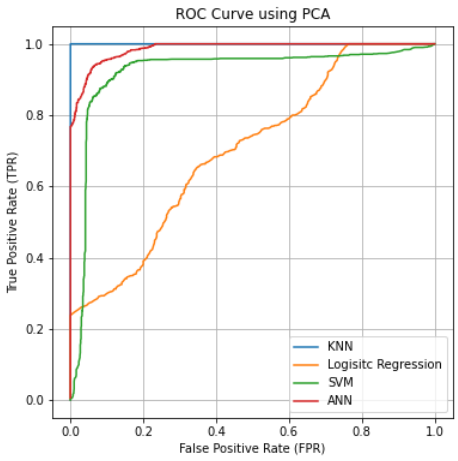


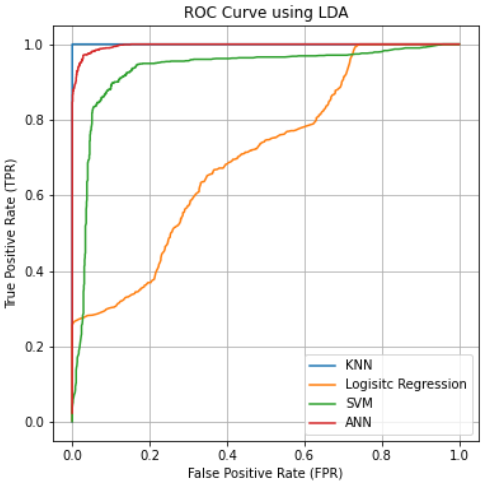




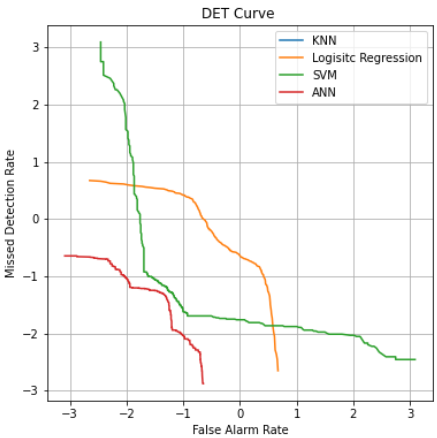
1.5 ROC curves

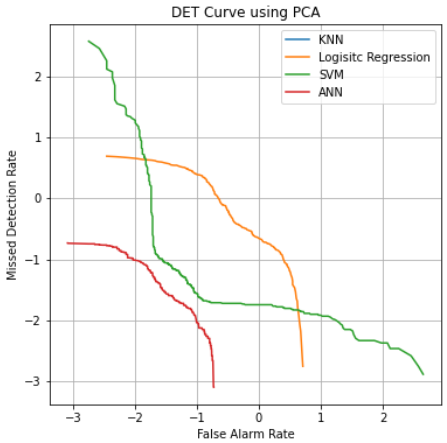


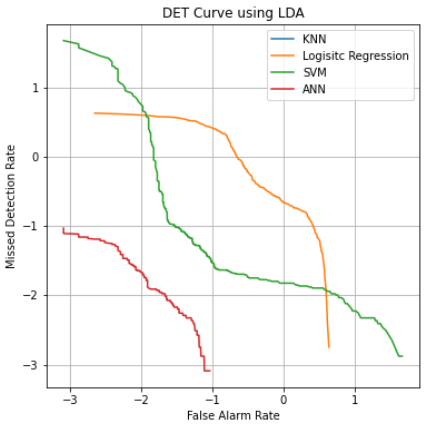




1.6 DET curves



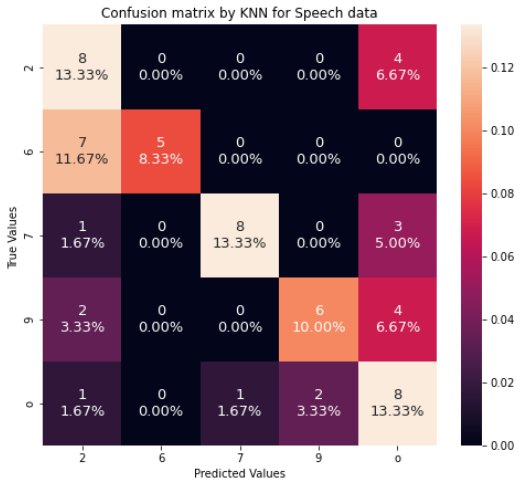


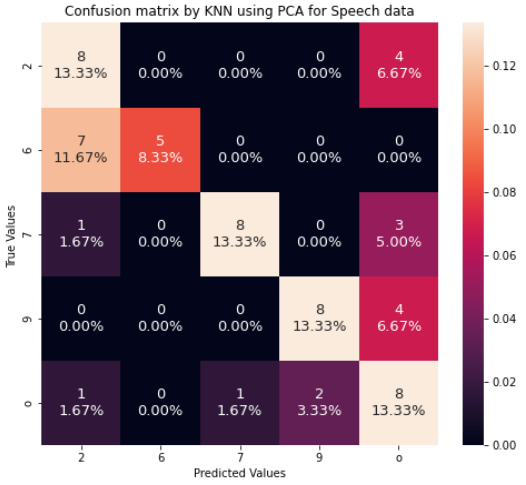


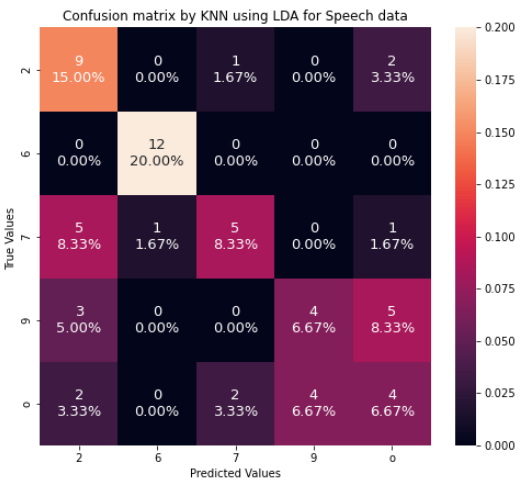
Dimensionality Reduction →			***PCA***		***LDA***	
Classifiers ↓	**Accuracy (%)**	**Misclassification rate (%)**	**Accuracy (%)**	**Misclassification rate (%)**	**Accuracy (%)**	**Misclassification rate (%)**
KNN (k = 4)	100	0	100	0	100	0
Logistic Regression	64.8	35.2	65.4	34.6	65.1	34.9
SVM	89.6	10.4	89.6	10.4	89.7	10.3
ANN	90.8	9.2	93.7	6.3	97.1	2.9

2) Isolated Spoken Digits Data set

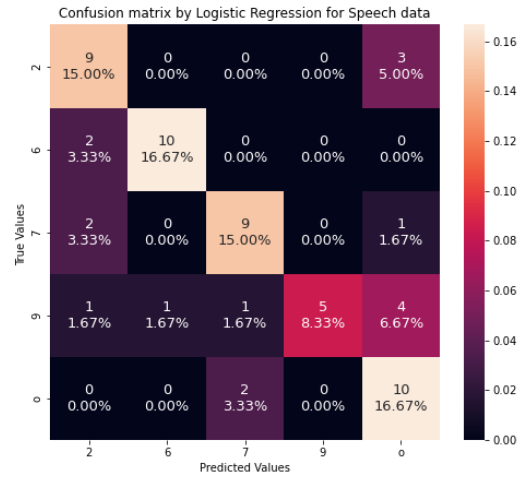
2.1 K-Nearest Neighbor

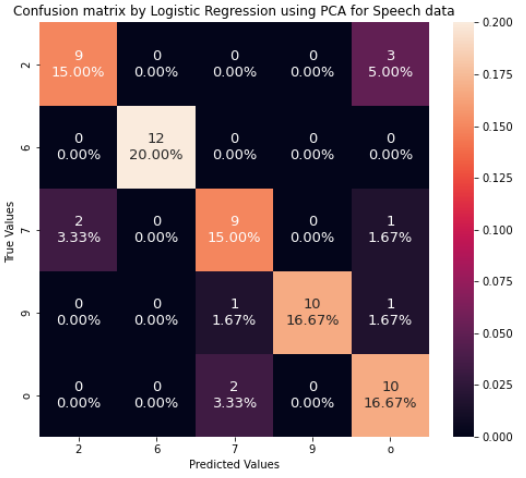


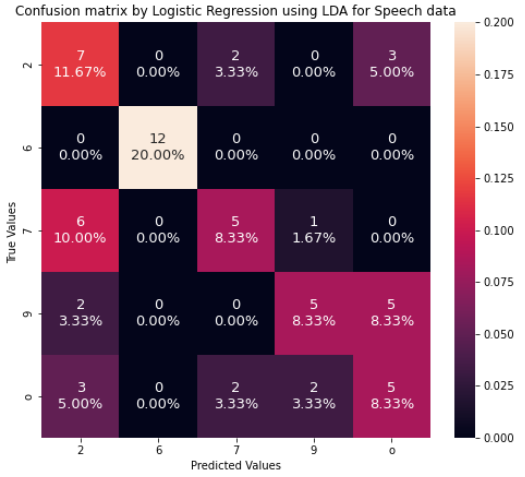




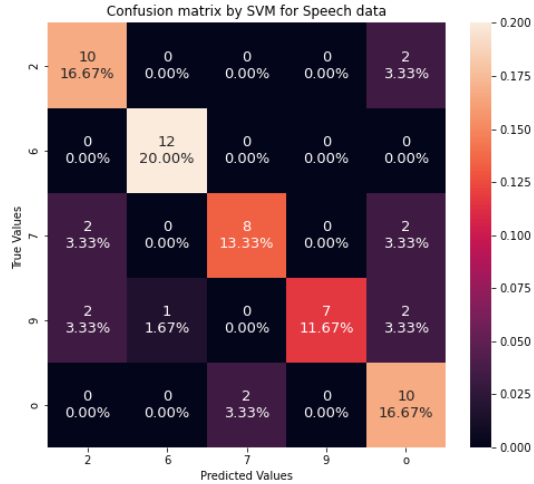
2.2 Logistic Regression

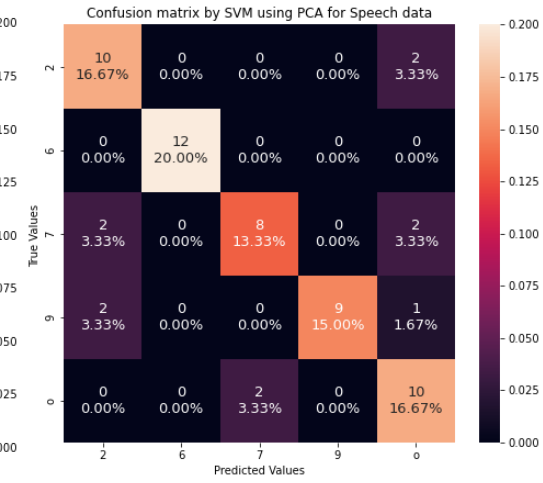


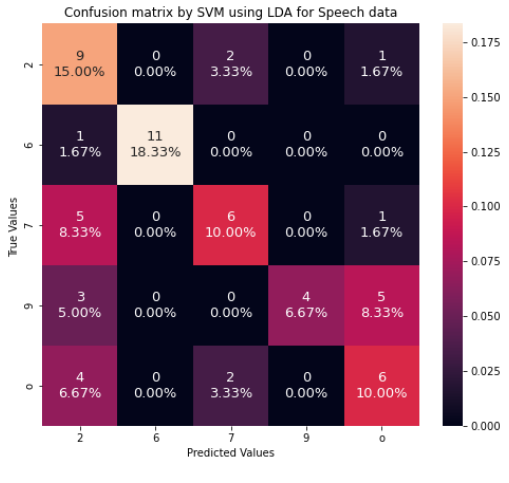




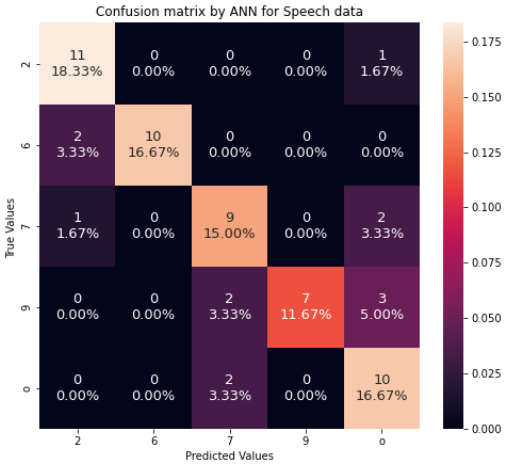
2.3 Support Vector Machines

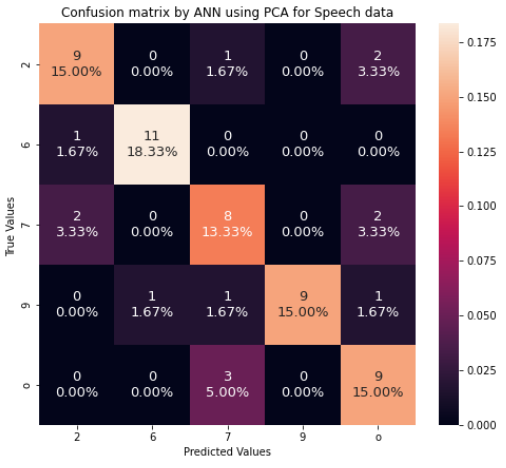


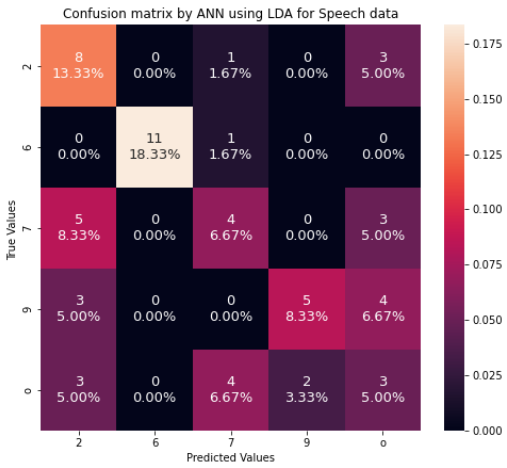




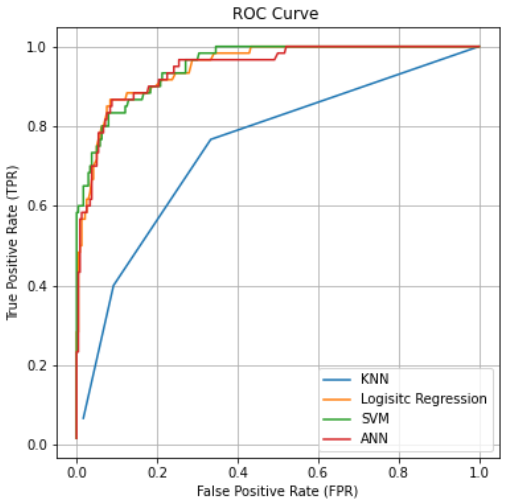
2.4 Artificial Neural Network

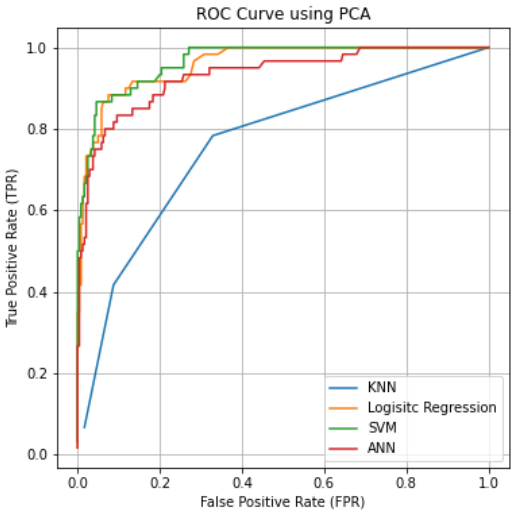


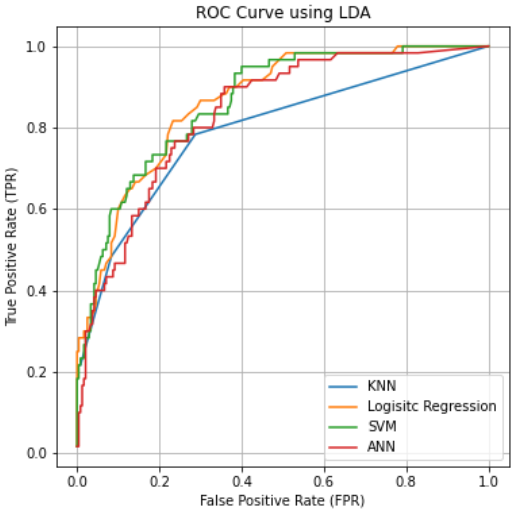




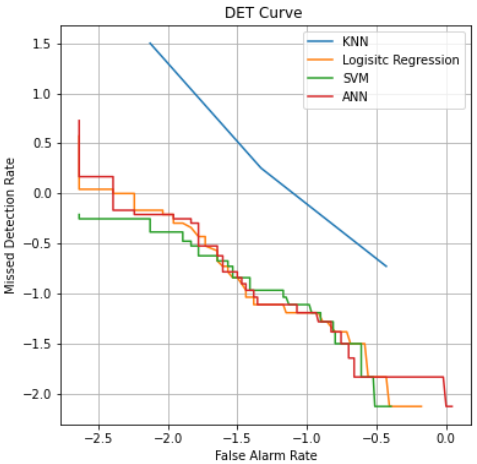
2.5 ROC curves

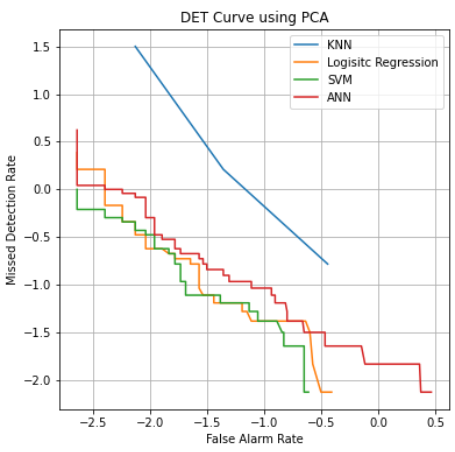


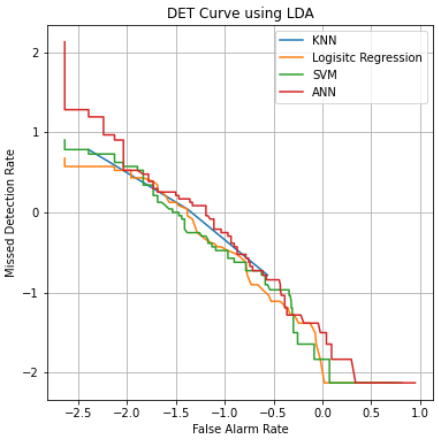




2.6 DET curves



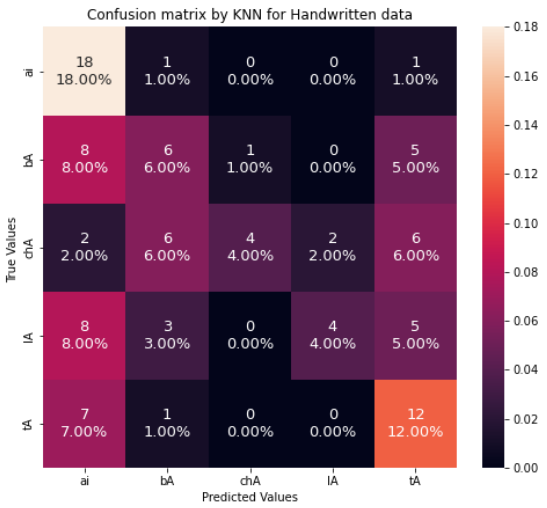


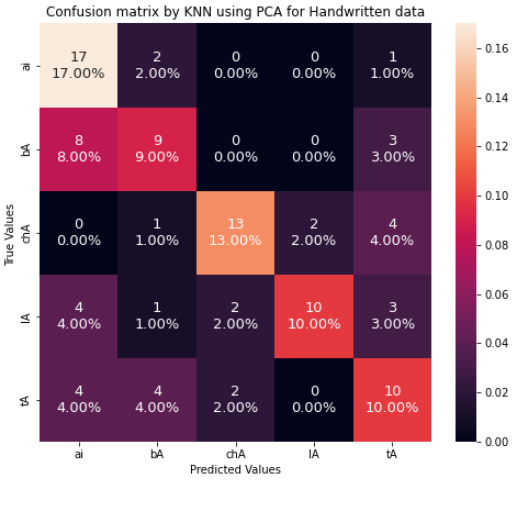


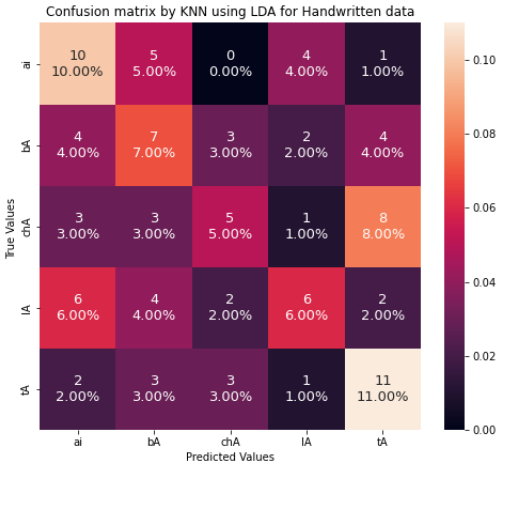
Dimensionality Reduction →			***PCA***		***LDA***	
Classifiers ↓	**Accuracy (%)**	**Misclassification rate (%)**	**Accuracy (%)**	**Misclassification rate (%)**	**Accuracy (%)**	**Misclassification rate (%)**
KNN (k = 3)	58.33	41.67	61.67	38.33	56.67	43.33
Logistic Regression	71.67	28.33	83.33	16.67	56.67	43.33
SVM	78.33	21.67	81.67	18.33	60	40
ANN	78.33	21.67	76.67	23.33	51.67	48.33

3) Handwritten Telugu Character Data Set

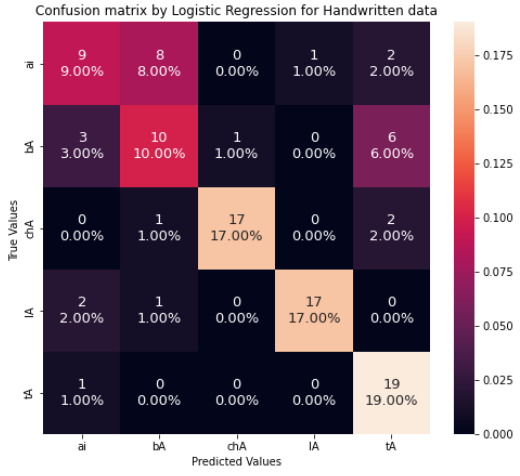
3.1 K-Nearest Neighbor

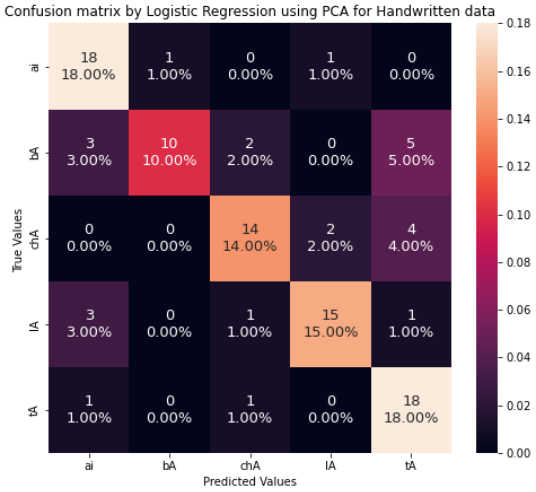


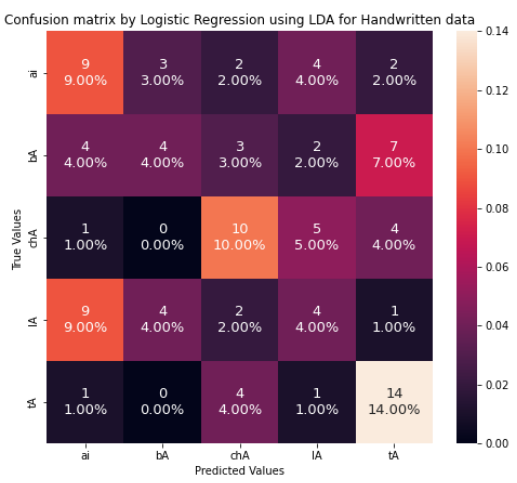




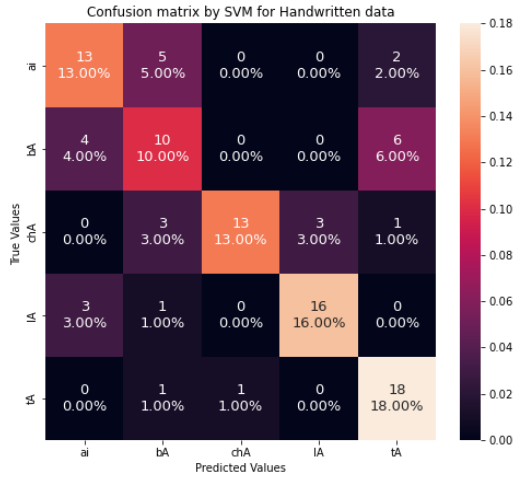
3.2 Logistic Regression

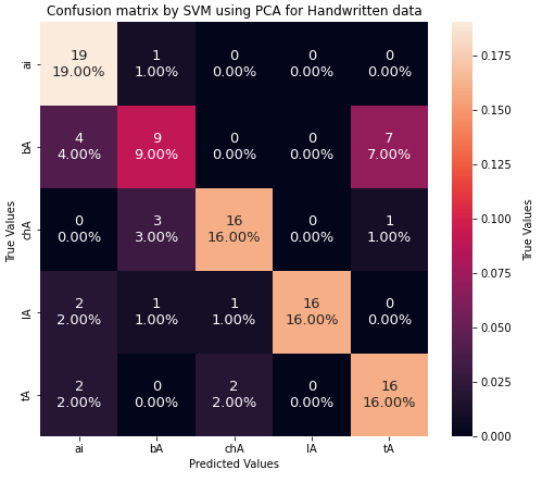


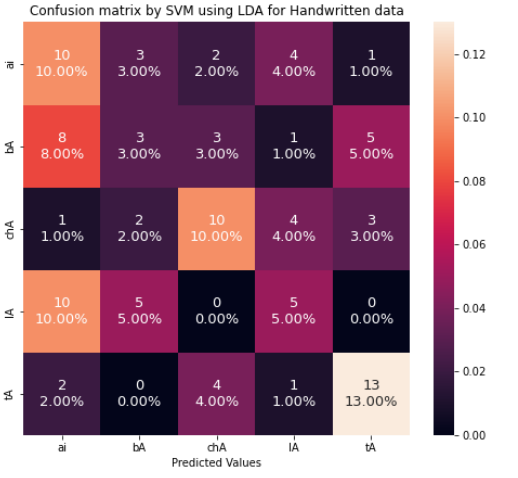




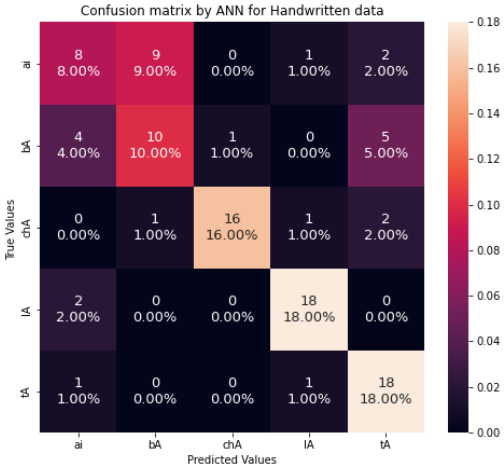
3.3 Support Vector Machines

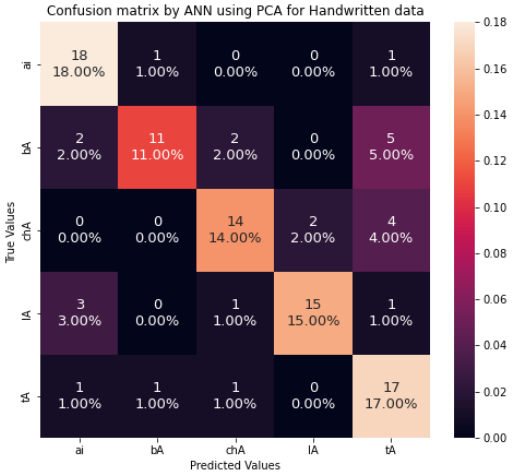


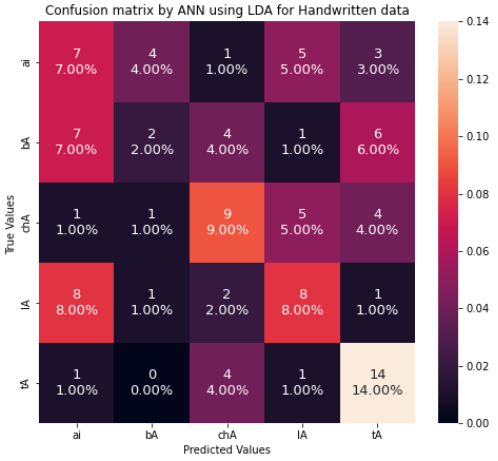




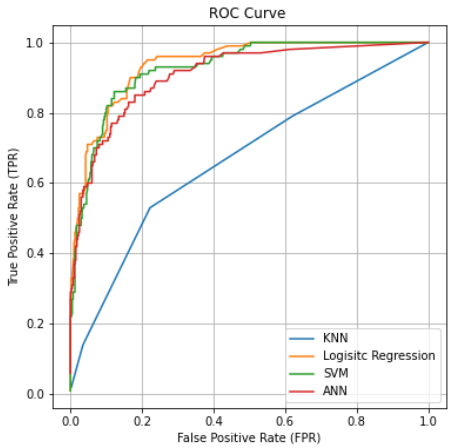
3.4 Artificial Neural Network

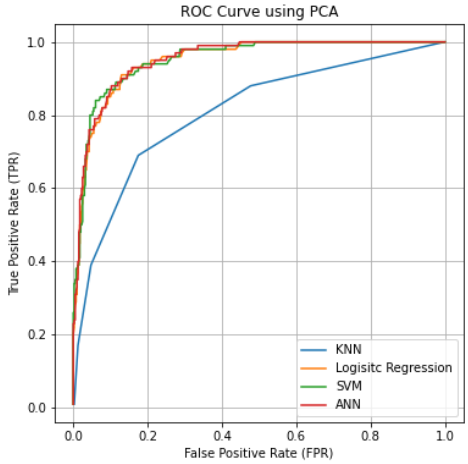


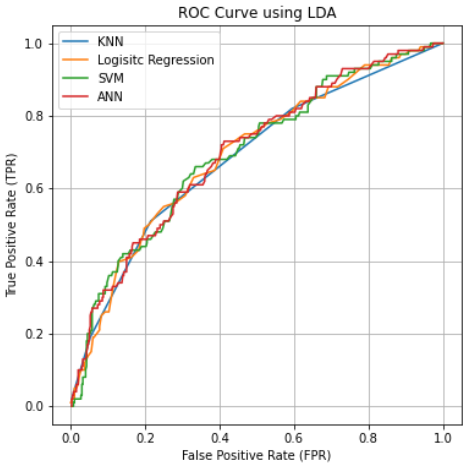




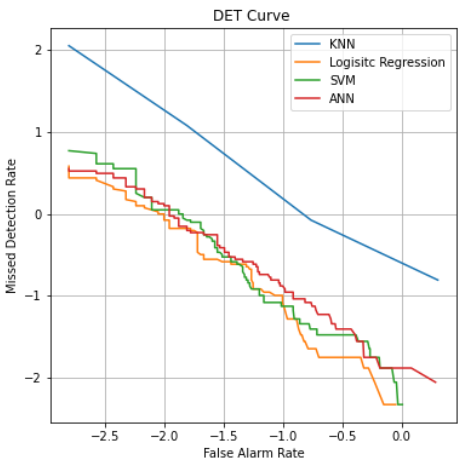
3.5 ROC curves

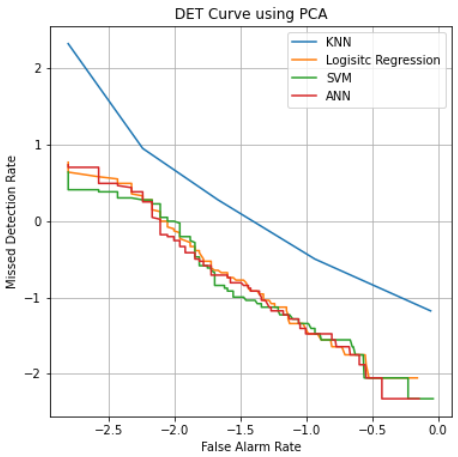


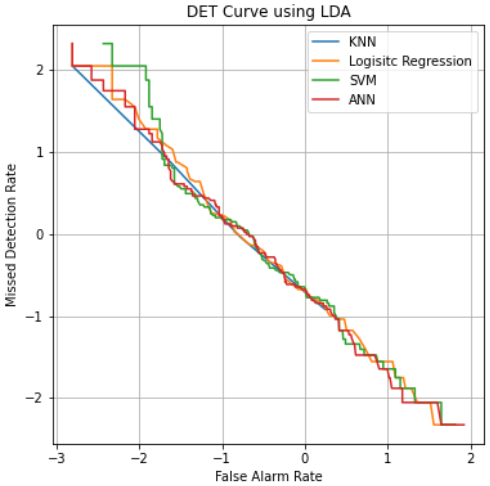




3.6 DET curves



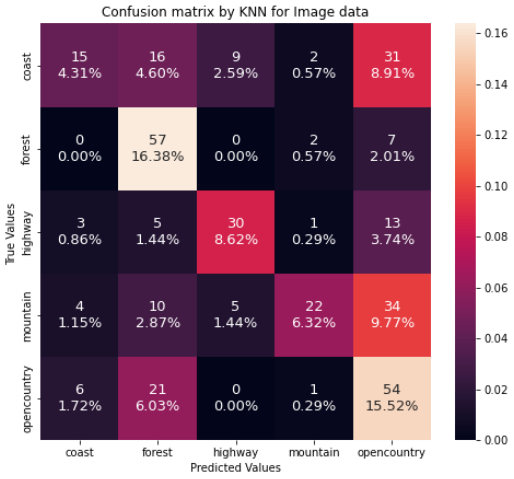


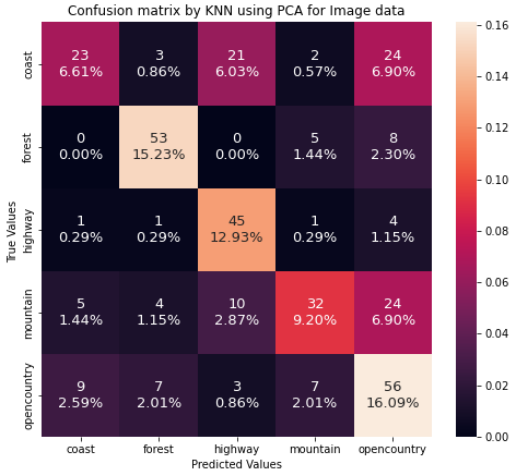


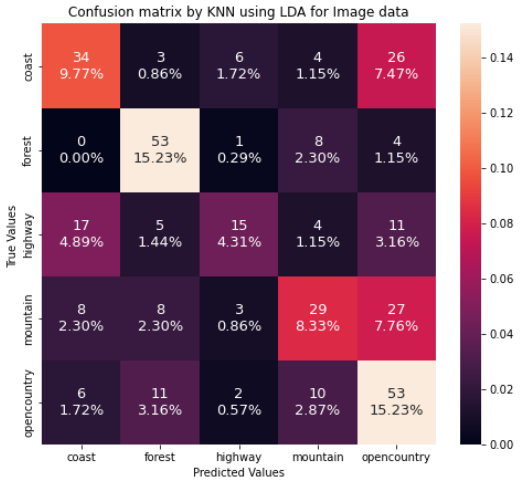
Dimensionality Reduction →			***PCA***		***LDA***	
Classifiers ↓	**Accuracy (%)**	**Misclassification rate (%)**	**Accuracy (%)**	**Misclassification rate (%)**	**Accuracy (%)**	**Misclassification rate (%)**
KNN (k = 5)	44	56	59	41	39	61
Logistic Regression	72	28	75	25	41	59
SVM	70	30	76	24	41	59
ANN	70	30	75	25	40	60

4) Image Data Set

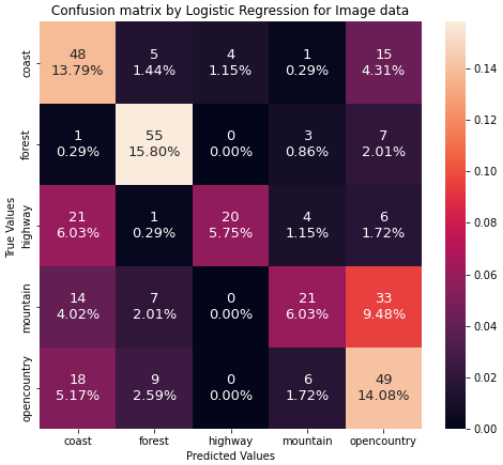
4.1 K-Nearest Neighbor

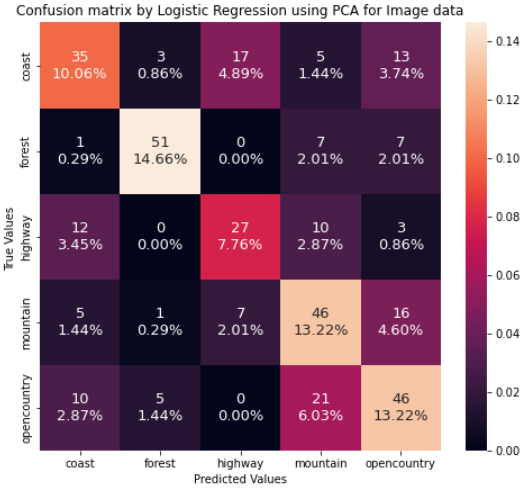


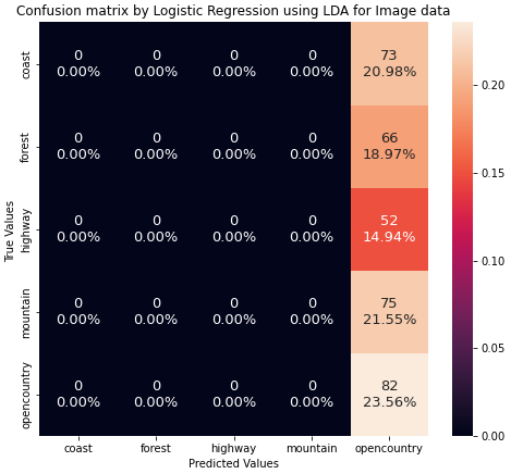




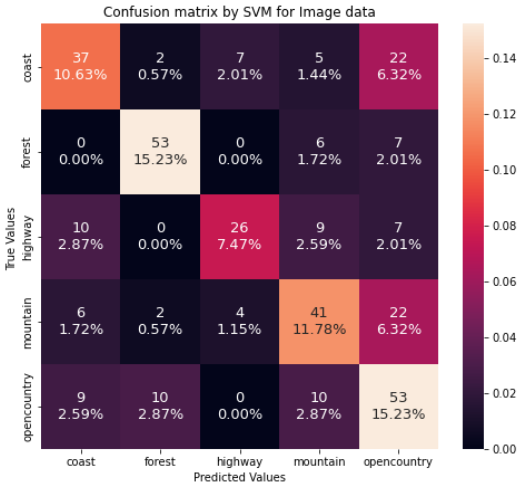
4.2 Logistic Regression

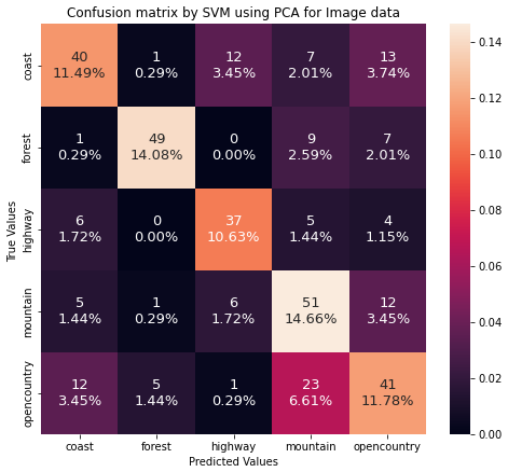


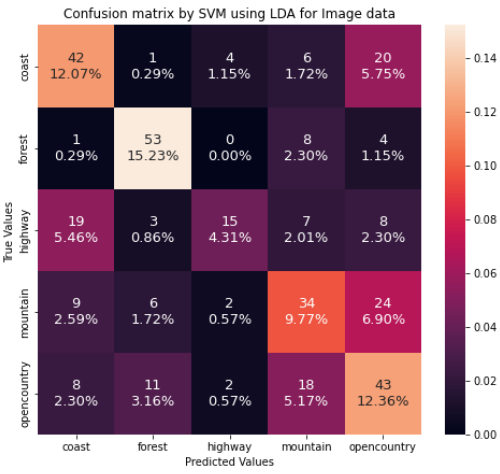




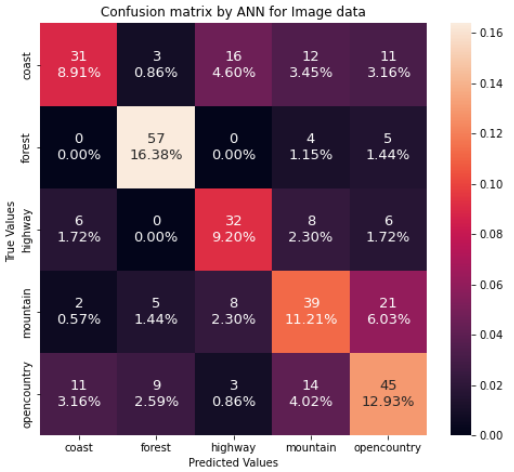
4.3 Support Vector Machines

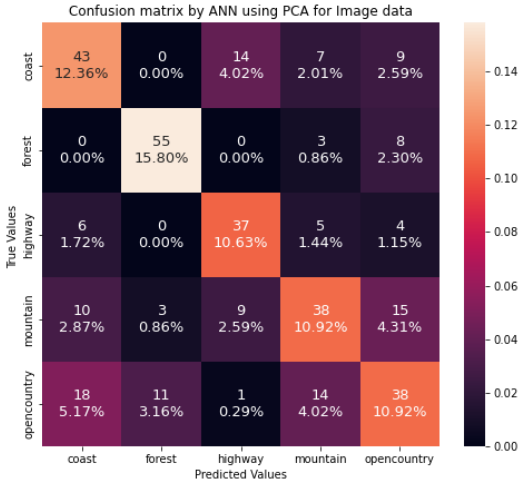


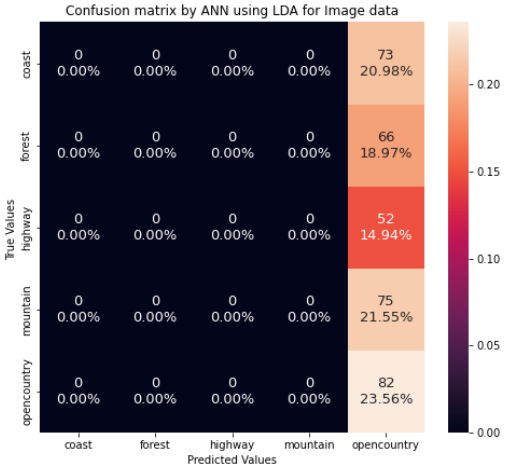




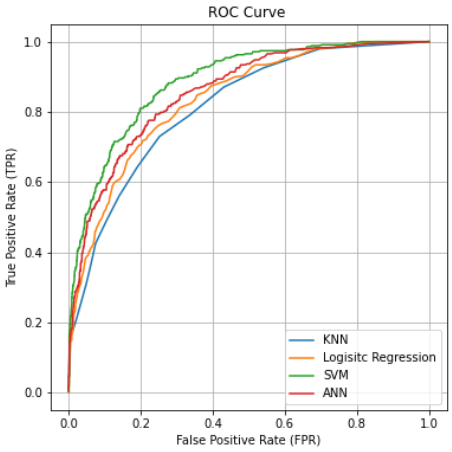
4.4 Artificial Neural Network

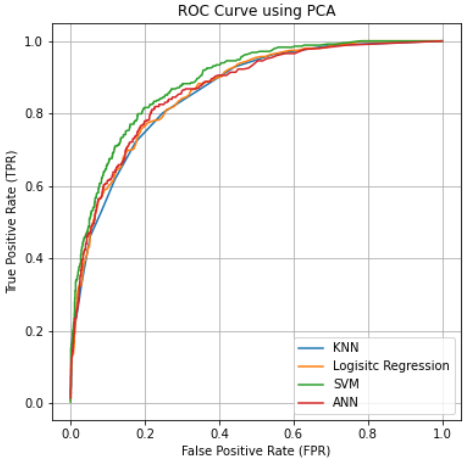


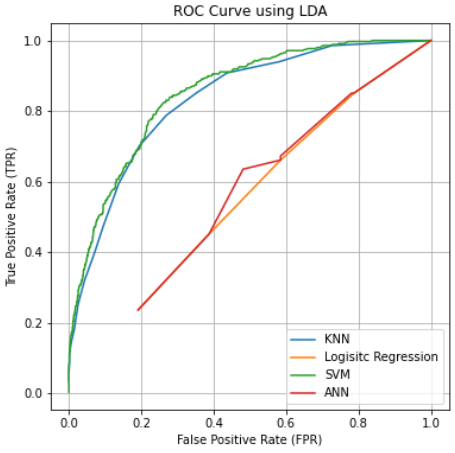




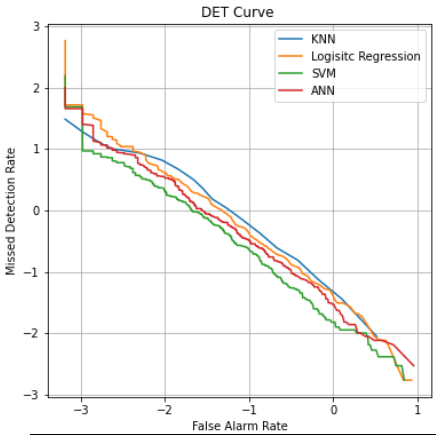
4.5 ROC curves

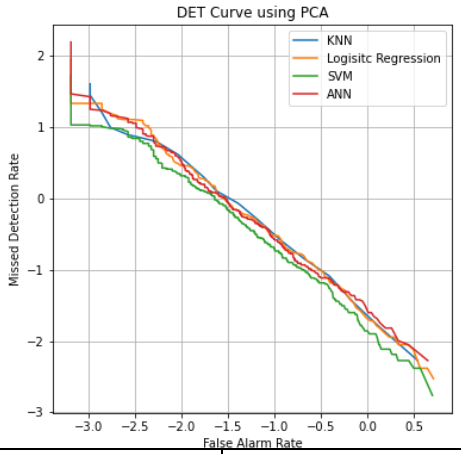


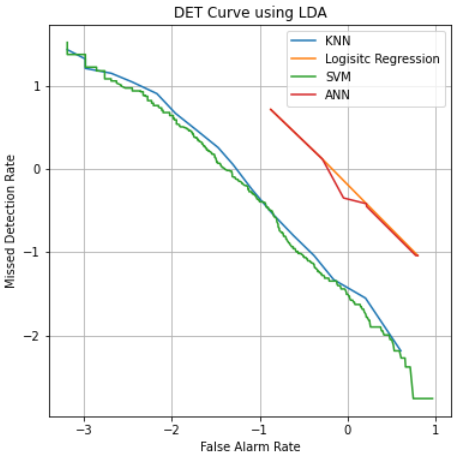




4.6 DET curves







Dimensionality Reduction →			***PCA***		***LDA***	
Classifiers ↓	**Accuracy (%)**	**Misclassification rate (%)**	**Accuracy (%)**	**Misclassification rate (%)**	**Accuracy (%)**	**Misclassification rate (%)**
KNN (k =20)	51.15	48.85	60.06	39.94	52.87	47.13
Logistic Regression	55.46	44.54	58.91	41.09	23.56	76.44
SVM	60.34	39.66	62.64	37.36	53.74	46.26
ANN	58.62	41.38	60.63	39.37	23.56	76.44