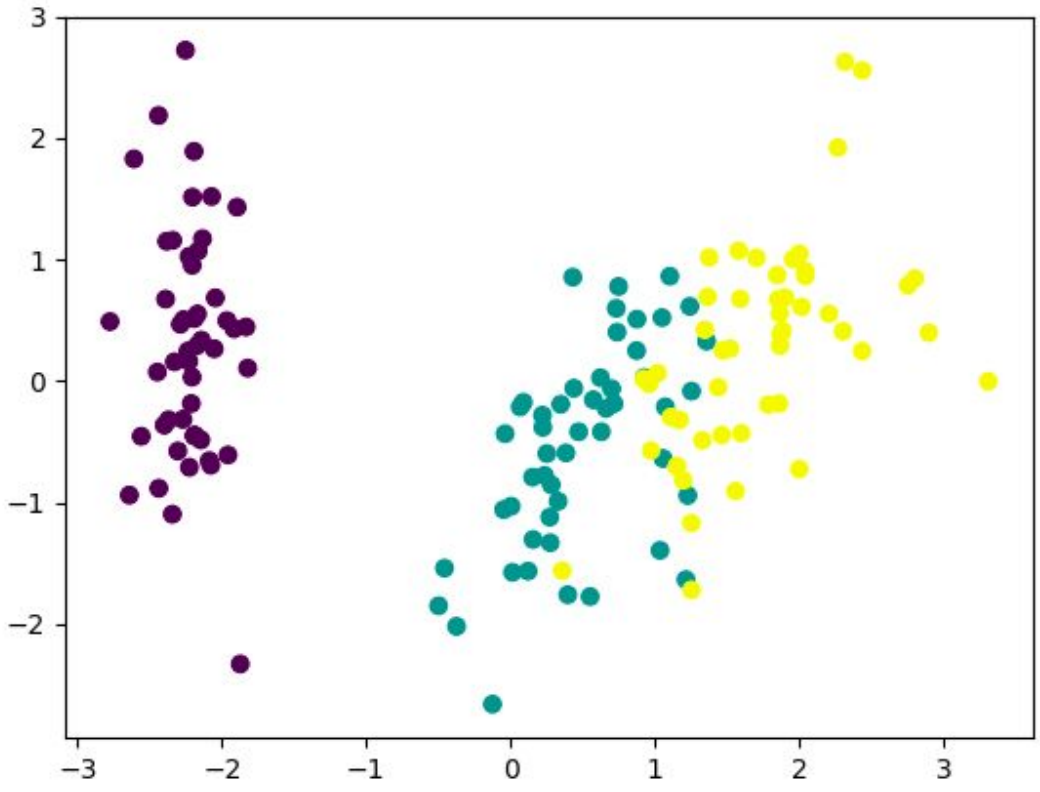
CS6510

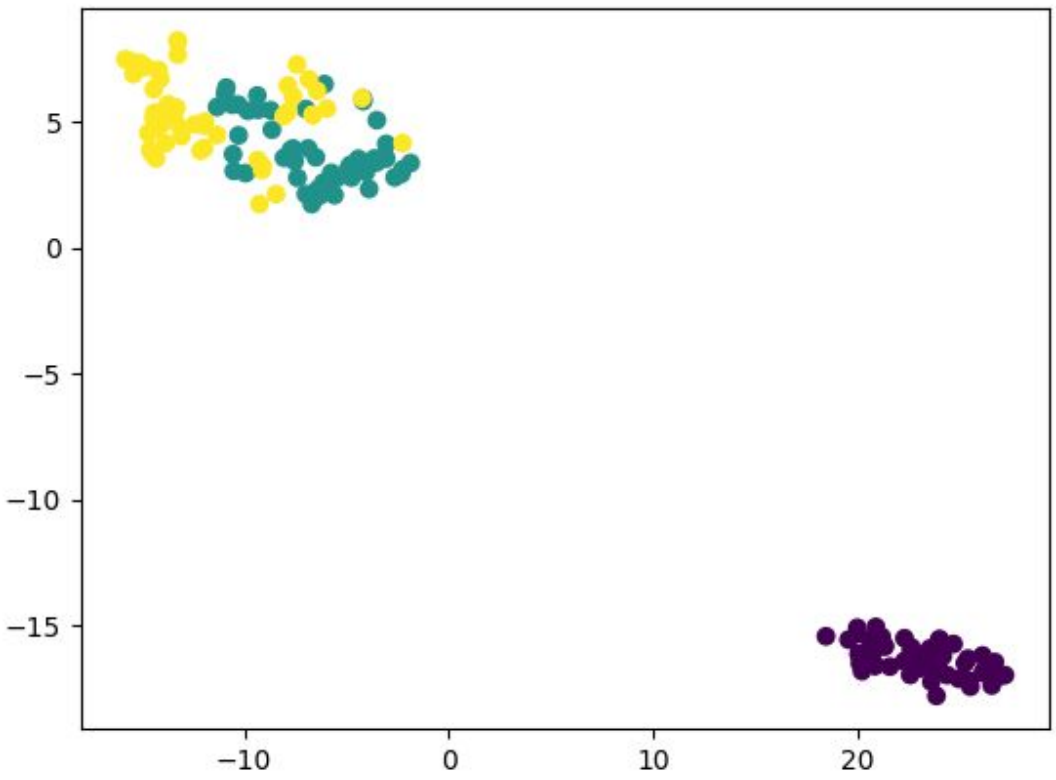
REPORT - HW4

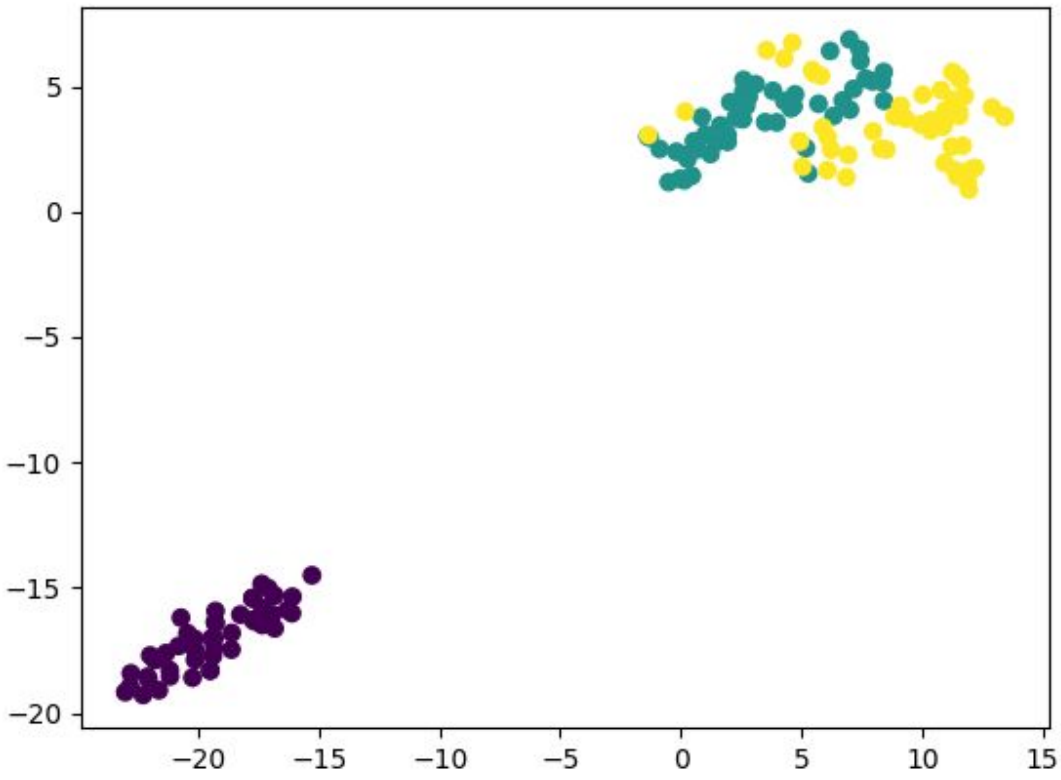
4a) 4a.py has the code for given problem.

The below graph is result of dimensionality reduction on Iris data using PCA. It is direct visualisation of data in low dimensions. It can be seen that small change in x-value(sepal length) can lead to misclassification where as change in y-value(sepal width) doesn't have such effect.



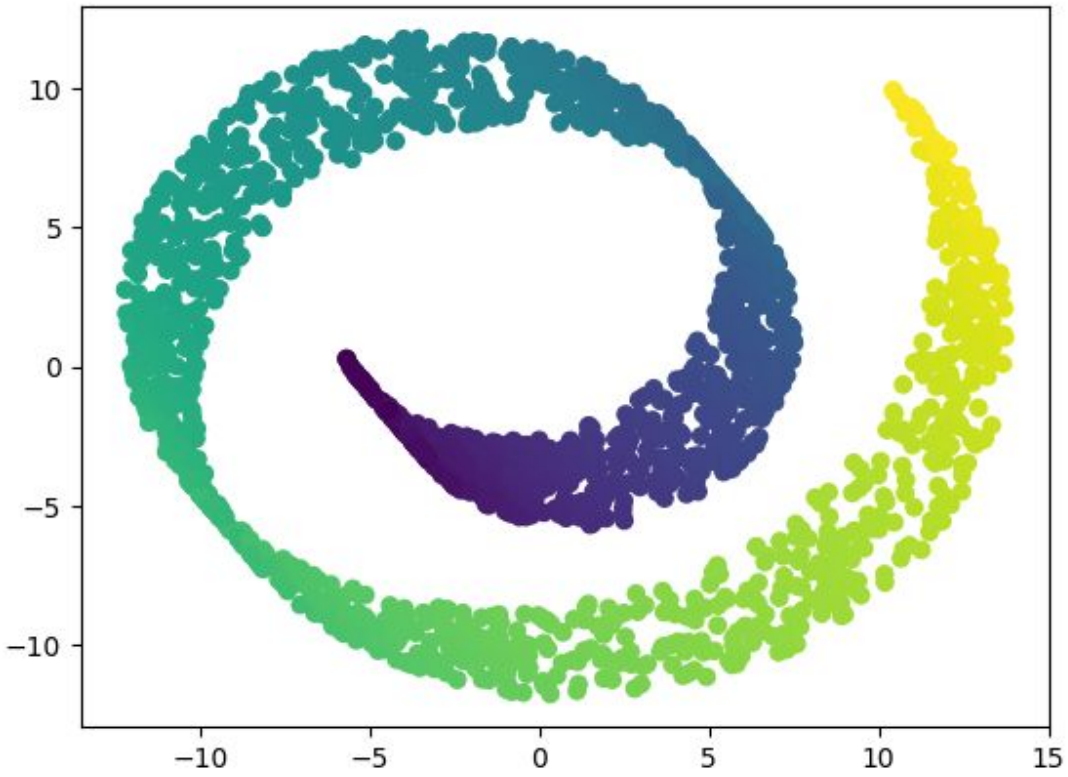
b) 4b.py has the code for given problem. Different plots are observed when ran multiple times. Two such being

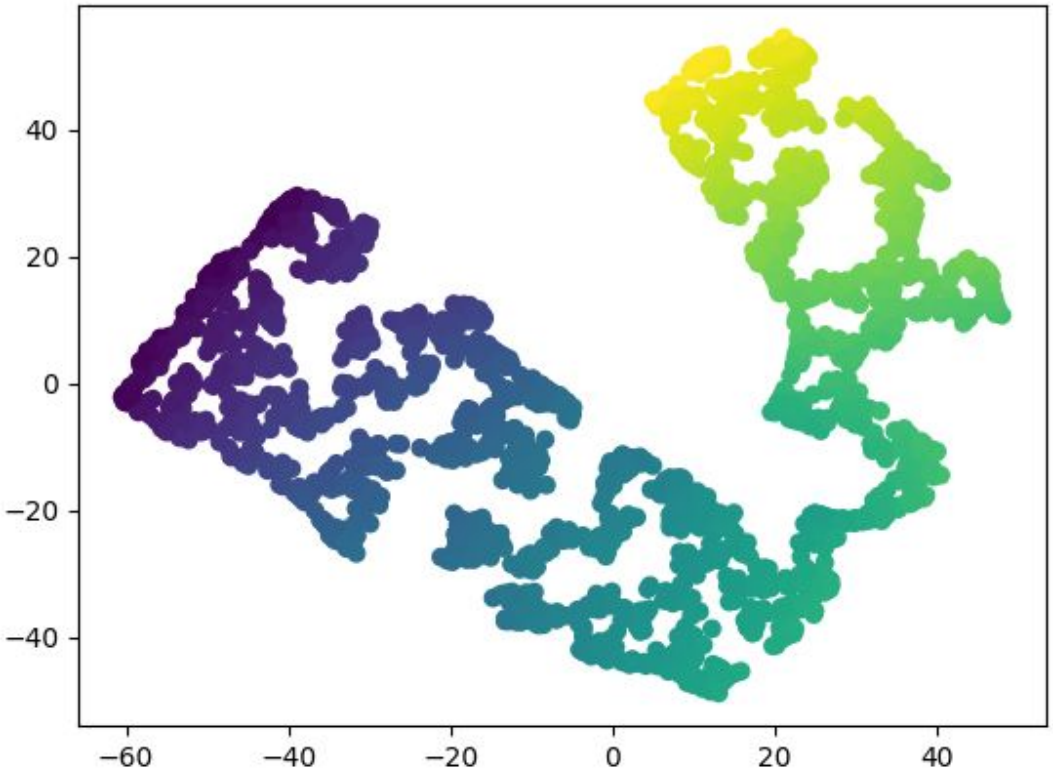




t-SNE unlike PCA,finds the similarities between data points and converts them into joint probabilities and tries to minimize the Kullback-Leibler divergence between the joint probabilities of the low-dimensional embedding and the high-dimensional data.

4c)4c.py has the code for the question.





As PCA is direct visualisation of data, the graph on implementing PCA on swiss roll data gave graph1(a swiss roll). Whereas t-SNE gave graph 2 because of the computations involved as mentioned in 4b.