Part A

PCS for IRIS DATASET: In this it forms beautiful scattered graph when its dimension are reduced from 3 dimension to 2 dimension. Setosa from X (-3 ,-2) and y (-1,1.5). Versicolor dimension changed to X(-1 to 2) whereas y from -1 to 1. virginica dimension X(0.5 to 4) where as y(-1.5 to y) and this is highly scattered among 3.

Part B

In TSNE dataset clustered in corner of graph setosa in one end and other two diagonal to setosa almost close. On changing the dimension the graph doesn't seems to change much. Tsne preserve local structure(closed data in higher dimension will also be closed after dimensionality reduction). The t-SNE algorithm models the probability distribution of neighbors around each point.

Part C

- **PCA of Swiss Roll dataset:** Every time we run it it form different way of representation(single linear model) but the basic structure is same its a roll. The reduced space is the space on the linear model, it is possible to project a new point on the manifold and thus testing the belonging of point to the manifold. PCA does not respect the manifold structure. We have use 3 dimensions to describe this manifold, thus no compression can be achieved at all.
- **TSNE of Swiss ROll Dataset:** Every time we run this its cluster or point of plot changes as when it reduces dimension its local structure are preserve since data present are not closely packed so every time we run its structure changes. The goal of the procedure is to find a mapping onto the 2-dimensional space that minimizes the differences between these two distributions over all points.