PES
INSTITUTIONS

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ASSIGNMENT 2

Problem Statement:
Using a dataset write a code that generates principal component analysis (PCA) and singular value decomposition (SVD).

Dataset: **IRIS** dataset

1)PCA

```
In [1]: from sklearn import datasets
        from sklearn.decomposition import PCA


        # import some data to play with
        iris = datasets.load_iris()

        data=iris['data']
        c = PCA(n_components=2).fit_transform(data)
        print(c)
```

```
[[-2.68412563  0.31939725]
 [-2.71414169 -0.17700123]
 [-2.88899057 -0.14494943]
 [-2.74534286 -0.31829898]
 [-2.72871654  0.32675451]
 [-2.28085963  0.74133045]
 [-2.82053775 -0.08946138]
 [-2.62614497  0.16338496]
 [-2.88638273 -0.57831175]
 [-2.6727558  -0.11377425]
 [-2.50694709  0.6450689 ]
 [-2.61275523  0.01472994]
 [-2.78610927 -0.235112  ]
 [-3.22380374 -0.51139459]
 [-2.64475039  1.17876464]
 [-2.38603903  1.33806233]
 [-2.62352788  0.81067951]
 [-2.64829671  0.31184914]
 [-2.19982032  0.87283904]
```

2)SVD

```
In [16]: from sklearn import datasets
         import seaborn as sns
         from scipy.linalg import svd
         import pandas as pd
         from sklearn.preprocessing import StandardScaler
         from sklearn.decomposition import TruncatedSVD

         df=pd.read_csv('IRIS.csv')
         iris = datasets.load_iris()
         data=iris['data']

         u,sigma,Vt=svd(data)
         #print("U",u)
         #print("sigma\n",sigma)
         #print("Vt\n",Vt)

         X = df.iloc[:,0:4].values
         y = df.iloc[:,4].values
         X_scaled = StandardScaler().fit_transform(X)
         svd = TruncatedSVD(n_components=2)
         Y_fitted = svd.fit_transform(X_scaled)
         print(Y_fitted)
```

```
[[-2.26454173e+00  5.05703903e-01]
 [-2.08642550e+00 -6.55404729e-01]
 [-2.36795045e+00 -3.18477311e-01]
 [-2.30419716e+00 -5.75367713e-01]
 [-2.38877749e+00  6.74767397e-01]
 [-2.07053681e+00  1.51854856e+00]
 [-2.44571134e+00  7.45626750e-02]
 [-2.23384186e+00  2.47613932e-01]
 [-2.34195768e+00 -1.09514636e+00]
 [-2.18867576e+00 -4.48629048e-01]
 [-2.16348656e+00  1.07059558e+00]
 [-2.32737775e+00  1.58587455e-01]
 [-2.22408272e+00 -7.09118158e-01]
 [-2.63971626e+00 -9.38281982e-01]
 [-2.19229151e+00  1.88997851e+00]
 [-2.25146521e+00  2.72237108e+00]
 [-2.20275048e+00  1.51375028e+00]
 [-2.19017916e+00  5.14304308e-01]
 [-1.89407429e+00  1.43111071e+00]
```