Adithya Kiran || Chirag P Tubakad || Arpit Agarwal || Nandakrishna
PES1201700231 || PES1201700896 || PES1201701084 || PES1201701090
ASSIGNMENT 2

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

Dataset: Iris dataset

Code:

```python
import pandas as pd
from sklearn.decomposition import PCA

url = "https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data"

df = pd.read_csv(url, names=['sepal length','sepal width','petal length','petal width','target'])
features = ['sepal length', 'sepal width', 'petal length', 'petal width']
x = df.loc[:, features].values
y = df.loc[:,['target']].values
pca = PCA(n_components=2)
principalComponents = pca.fit_transform(x)
principalDf = pd.DataFrame(data = principalComponents, columns = ['Principal component 1', 'Principal component 2'])
finalDataFrame = pd.concat([principalDf, df[['target']]], axis = 1)
print(finalDataFrame.head())
```

```python
from sklearn.decomposition import TruncatedSVD
import pandas as pd
url = "https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data"

df = pd.read_csv(url, names=['sepal length','sepal width','petal length','petal width','target'])
features = ['sepal length', 'sepal width', 'petal length', 'petal width']
x = df.loc[:, features].values
svd = TruncatedSVD(2)
principalComponents = svd.fit_transform(x)
principalDf = pd.DataFrame(data = principalComponents, columns = ['Principal component 1', 'Principal component 2'])
finalDataFrame = pd.concat([principalDf, df[['target']]], axis = 1)
print(finalDataFrame.head())
```

Output:

```
File  Edit  View  Search  Terminal  Help
arpit@XPS-13:~/daAssi/Data-Analytics-Assignments/Assignment_2_PCA_and_SVD$ python3 PCA.py
   Principal component 1  Principal component 2       target
0              -2.684207               0.326607  Iris-setosa
1              -2.715391              -0.169557  Iris-setosa
2              -2.889820              -0.137346  Iris-setosa
3              -2.746437              -0.311124  Iris-setosa
4              -2.728593               0.333925  Iris-setosa
arpit@XPS-13:~/daAssi/Data-Analytics-Assignments/Assignment_2_PCA_and_SVD$ python3 SVD.py.py
python3: can't open file 'SVD.py.py': [Errno 2] No such file or directory
arpit@XPS-13:~/daAssi/Data-Analytics-Assignments/Assignment_2_PCA_and_SVD$ python3 SVD.py
   Principal component 1  Principal component 2       target
0               5.912204               2.303442  Iris-setosa
1               5.572076               1.973831  Iris-setosa
2               5.446485               2.096533  Iris-setosa
3               5.436019               1.871681  Iris-setosa
4               5.875066               2.329348  Iris-setosa
arpit@XPS-13:~/daAssi/Data-Analytics-Assignments/Assignment_2_PCA_and_SVD$ 
```