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Problem Statement:

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

Dataset: Iris dataset

Code:

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

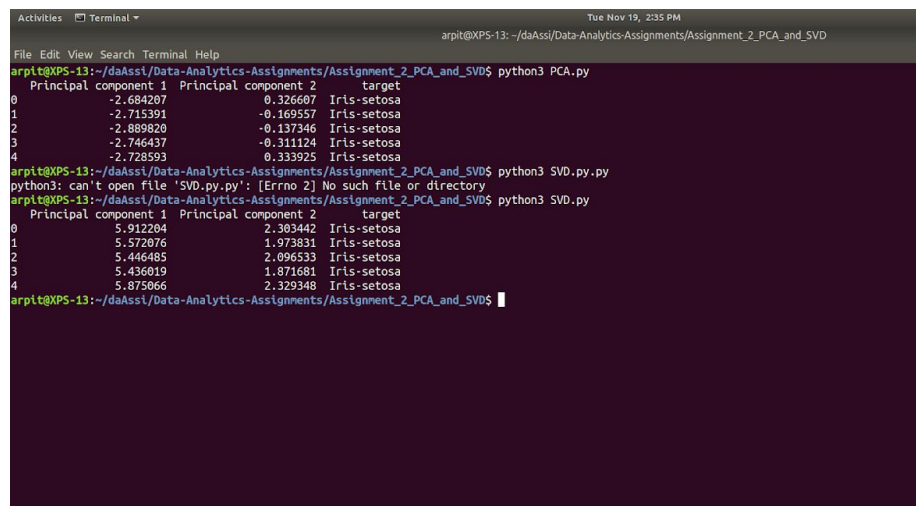
url = "https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data"

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())
```

```
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:



```
Activities Terminal Tue Nov 19, 2:35 PM
arpit@XPS-13: ~/daAssi/Data-Analytics-Assignments/Assignment_2_PCA_and_SVD
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 2.329340 Iris-setosa
arpit@XPS-13:~/daAssi/Data-Analytics-Assignments/Assignment_2_PCA_and_SVD$
```