```
pip install scikit-learn
```

```
    Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
    Requirement already satisfied: scikit-learn in /usr/local/lib/python3.9/dist-packages (1.2.2)
    Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.9/dist-packages (from scikit-learn) (3.1.0)
    Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python3.9/dist-packages (from scikit-learn) (1.22.4)
    Requirement already satisfied: scipy>=1.3.2 in /usr/local/lib/python3.9/dist-packages (from scikit-learn) (1.10.1)
    Requirement already satisfied: joblib>=1.1.1 in /usr/local/lib/python3.9/dist-packages (from scikit-learn) (1.2.0)
```

```
import time
import numpy as np
import pandas as pd
import jieba
import matplotlib.cm as cm
import json
from matplotlib import pyplot as plt
from sklearn.cluster import KMeans,MiniBatchKMeans
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.decomposition import PCA
from sklearn.manifold import TSNE
```

```
with open("movie_all_info.json") as movie:
    movie_info=json.load(movie)
with open("stopword.txt","r",encoding="utf8") as f:
    stopword=f.read()
```

```
my_list=[]
for i in range(len(movie_info)):
    my_list.append(movie_info[i]["intro"])
```

```
tfidf = TfidfVectorizer()
text = tfidf.fit_transform(my_list)
```

```
print(text)
```

```
      (0, 13452)	0.14313034437466243
      (0, 66793)	0.14313034437466243
      (0, 77762)	0.14313034437466243
      (0, 57876)	0.14313034437466243
      (0, 189600)	0.13687583908327894
      (0, 201630)	0.14313034437466243
      (0, 57788)	0.14313034437466243
      (0, 170639)	0.14313034437466243
      (0, 132512)	0.12899609430887443
      (0, 202872)	0.14313034437466243
      (0, 138716)	0.14313034437466243
      (0, 177461)	0.14313034437466243
      (0, 58472)	0.14313034437466243
      (0, 110375)	0.14313034437466243
      (0, 53383)	0.12618369166584142
      (0, 46749)	0.14313034437466243
      (0, 37187)	0.14313034437466243
      (0, 35429)	0.14313034437466243
      (0, 169002)	0.14313034437466243
      (0, 148847)	0.14313034437466243
      (0, 29705)	0.13687583908327894
      (0, 139418)	0.14313034437466243
      (0, 196888)	0.14313034437466243
      (0, 130452)	0.14313034437466243
      (0, 178140)	0.14313034437466243
      :	:
      (7877, 191020)	0.20000000000000007
      (7877, 105044)	0.20000000000000007
      (7877, 218599)	0.20000000000000007
      (7877, 110176)	0.20000000000000007
      (7877, 109378)	0.20000000000000007
      (7877, 38383)	0.20000000000000007
      (7877, 51833)	0.20000000000000007
      (7877, 142664)	0.20000000000000007
      (7877, 29843)	0.20000000000000007
      (7877, 24718)	0.20000000000000007
      (7877, 56278)	0.20000000000000007
      (7877, 181559)	0.20000000000000007
      (7877, 12370)	0.20000000000000007
      (7877, 76405)	0.20000000000000007
      (7877, 61532)	0.20000000000000007
      (7877, 90367)	0.20000000000000007
      (7877, 181278)	0.20000000000000007
```

```
  (7877, 82937)	0.20000000000000007
  (7877, 86777)	0.20000000000000007
  (7877, 62194)	0.20000000000000007
  (7877, 176732)	0.20000000000000007
  (7877, 82936)	0.20000000000000007
  (7877, 199135)	0.20000000000000007
  (7877, 63713)	0.20000000000000007
  (7877, 101049)	0.20000000000000007
```

KNN

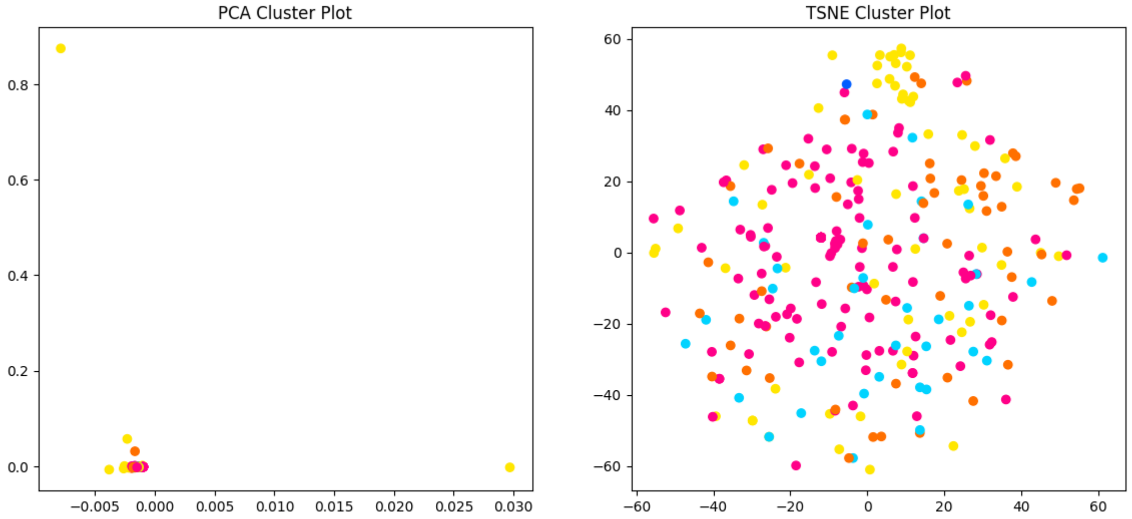
```
kmeans = KMeans(n_clusters=10,random_state=42,max_iter=100,).fit(text).fit_predict(text)
```

```
/usr/local/lib/python3.9/dist-packages/sklearn/cluster/_kmeans.py:870: FutureWarning: The default value of `n_init` will change from 10 to 'auto
  warnings.warn(
```

```
clusters = MiniBatchKMeans(n_clusters=14, init_size=1024, batch_size=2048, random_state=20).fit_predict(text)
```

```
/usr/local/lib/python3.9/dist-packages/sklearn/cluster/_kmeans.py:870: FutureWarning: The default value of `n_init` will change from 3 to 'auto'
  warnings.warn(
```

```
def plot_tsne_pca(data, labels):
    max_label = max(labels)
    max_items = np.random.choice(range(data.shape[0]), size=3000, replace=False)

    pca = PCA(n_components=2).fit_transform(data[max_items,:].toarray())
    tsne = TSNE().fit_transform(PCA(n_components=50).fit_transform(data[max_items,:].toarray()))

    idx = np.random.choice(range(pca.shape[0]), size=300, replace=False)
    label_subset = labels[max_items]
    label_subset = [cm.hsv(i/max_label) for i in label_subset[idx]]

    f, ax = plt.subplots(1, 2, figsize=(14, 6))

    ax[0].scatter(pca[idx, 0], pca[idx, 1], c=label_subset)
    ax[0].set_title('PCA Cluster Plot')

    ax[1].scatter(tsne[idx, 0], tsne[idx, 1], c=label_subset)
    ax[1].set_title('TSNE Cluster Plot')

plot_tsne_pca(text, clusters)
```



```
train_data=[]
for i in range(len(movie_info)):
    train_data.append(movie_info[i]["intro"])
```

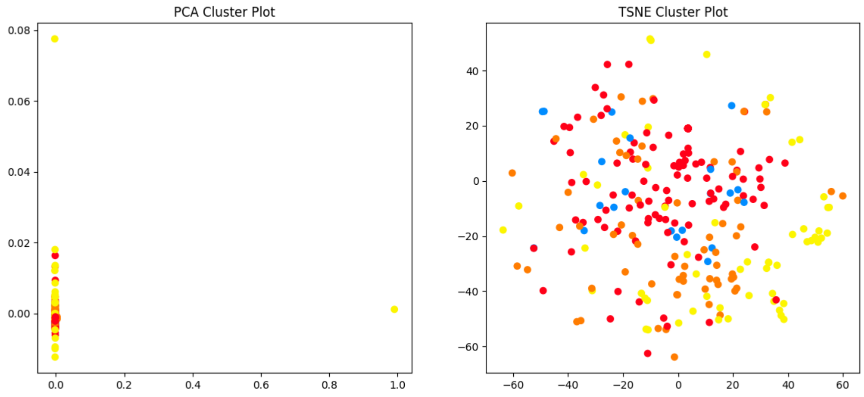
```
from sklearn.model_selection import train_test_split
xtrain,xval,ytrain,yval=train_test_split(my_list,clusters,random_state=87, test_size=0.1)
```

```
from sklearn.svm import SVC
xtrain_tfidf=tfidf.fit_transform(xtrain)
svm_clf=SVC()
svm_clf.fit(xtrain_tfidf,ytrain)
```

```
▾ SVC
SVC()
```

```
value=tfidf.transform(train_data)
y=svm_clf.predict(value)
```

```
# plt.subplot(233)
# X0, X1 = xval_tfidf[:, 0], xval_tfidf[:, 1]
plot_tsne_pca(text, y)
```


PCA Cluster Plot
TSNE Cluster Plot