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https://github.com/mdabdullahibnaharun/youtube-spam-comment-ditector

Import modules dataset

```
#-------------- Youtube Spam Comment Detector--------------------#

# converting words into vectors to use as fetures to help in classification

#EDA packages
import pandas as pd
import numpy as np



# Ml packages for vectorization of text for feature extraction

from sklearn.feature_extraction.text import CountVectorizer
from sklearn.feature_extraction.text import TfidfVectorizer



# Visualization packages

import matplotlib.pyplot as plt
import seaborn as sns



from google.colab import files
```

```
uploaded = files.upload()

for fn in uploaded.keys():
  print('User uploaded file "{name}" with length {length} bytes'.format(
      name=fn, length=len(uploaded[fn])))
```

Choose Files No file chosen Upload widget is only available when the cell has been executed in the current browser session. Please rerun this cell to enable.

```
Saving Youtube01-Psy.csv to Youtube01-Psy.csv
Saving Youtube02-KatyPerry.csv to Youtube02-KatyPerry.csv
Saving Youtube03-LMFAO.csv to Youtube03-LMFAO.csv
Saving Youtube04-Eminem.csv to Youtube04-Eminem.csv
Saving Youtube05-Shakira.csv to Youtube05-Shakira.csv
User uploaded file "Youtube01-Psy.csv" with length 57438 bytes
User uploaded file "Youtube02-KatyPerry.csv" with length 64279 bytes
User uploaded file "Youtube03-LMFAO.csv" with length 64419 bytes
User uploaded file "Youtube04-Eminem.csv" with length 82896 bytes
User uploaded file "Youtube05-Shakira.csv" with length 72706 bytes
```

```
#Dataset from Kaggle
df1 = pd.read_csv("Youtube01-Psy.csv")
df1.head()
```

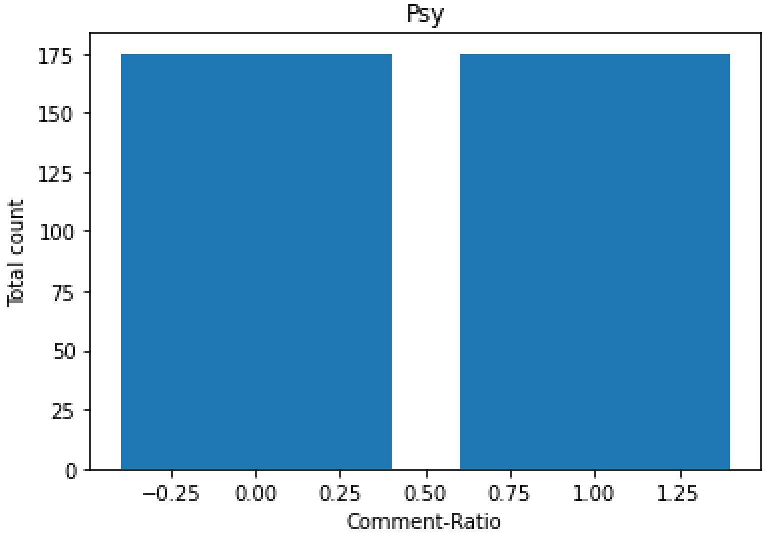
	COMMENT_ID	AUTHOR	DATE	CONTENT	CLASS
0	LZQPQhLyRh80UYxNuaDWhIGQYNQ96IuCg-AYWqNPjpU	Julius NM	2013-11-07T06:20:48	Huh, anyway check out this you[tube] channel: ...	1
1	LZQPQhLyRh_C2cTtd9MvFRJedxydaVW-2sNg5Diuo4A	adam riyati	2013-11-07T12:37:15	Hey guys check out my new channel and our firs...	1
2	LZQPQhLyRh9MSZYnf8djyk0gEF9BHDPYrrK-qCczIY8	Evgeny Murashkin	2013-11-08T17:34:21	just for test I have to say murdev.com	1
		ElNino	2013-11-	me shaking my sexy ass on my	

```
#load all dataset to mearge them
df2 = pd.read_csv("Youtube02-KatyPerry.csv")
df3 = pd.read_csv("Youtube03-LMFAO.csv")
df4= pd.read_csv("Youtube04-Eminem.csv")
df5= pd.read_csv("Youtube05-Shakira.csv")
```

Data Visualization

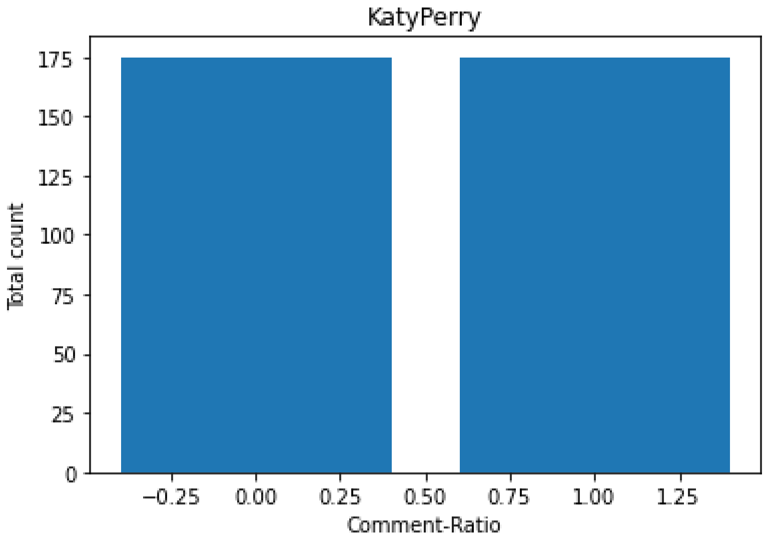
```
data = df1['CLASS'].value_counts()
name= data.index
count = data.values

plt.title("Psy")
plt.xlabel('Comment-Ratio')
plt.ylabel('Total count')

plt.bar(name,count)
```

```
<BarContainer object of 2 artists>
```



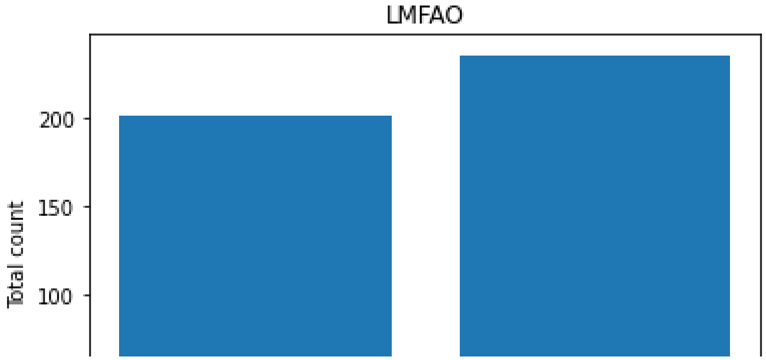
```
data = df2['CLASS'].value_counts()
name= data.index
count = data.values

plt.title("KatyPerry")
plt.xlabel('Comment-Ratio')
plt.ylabel('Total count')

plt.bar(name,count)
```

```
<BarContainer object of 2 artists>
```



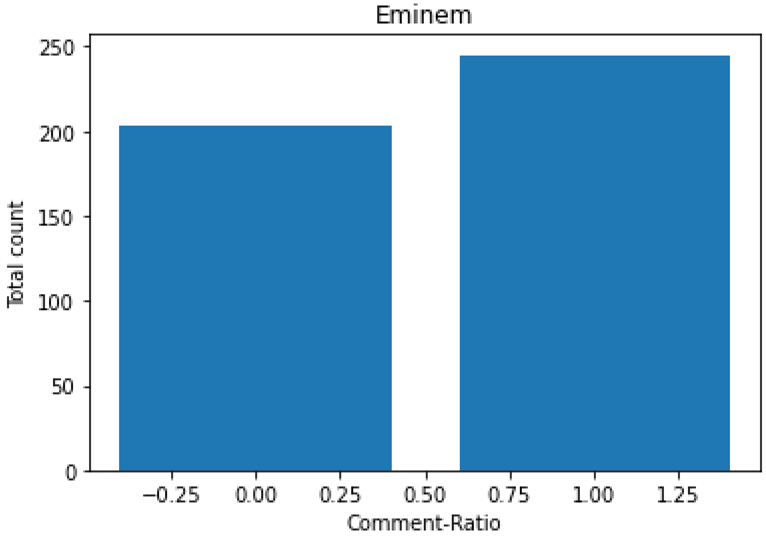
```
data = df3['CLASS'].value_counts()
name= data.index
count = data.values

plt.title("LMFAO")
plt.xlabel('Comment-Ratio')
plt.ylabel('Total count')


plt.bar(name,count)
```

```
<BarContainer object of 2 artists>
```



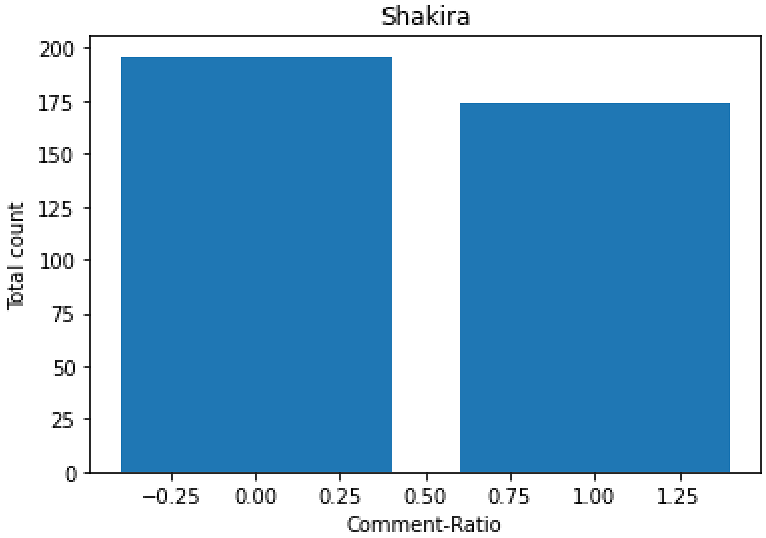
```
data = df4['CLASS'].value_counts()
name= data.index
count = data.values

plt.title("Eminem")
plt.xlabel('Comment-Ratio')
plt.ylabel('Total count')

plt.bar(name,count)
```

```
<BarContainer object of 2 artists>
```

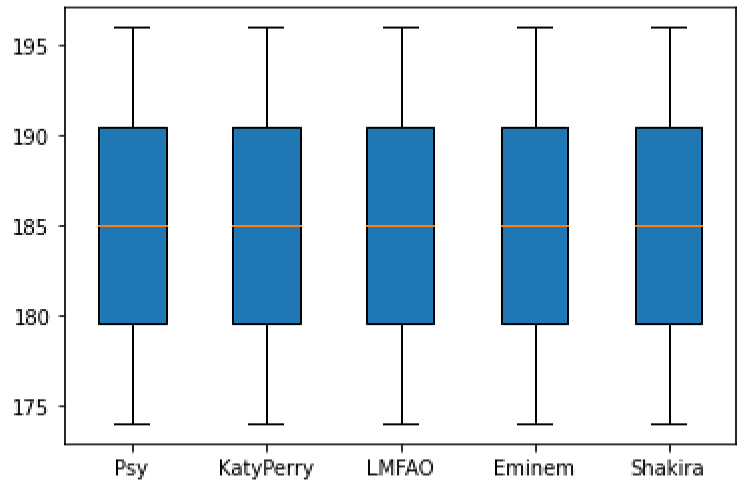


```
data = df5['CLASS'].value_counts()
name= data.index
count = data.values

plt.title("Shakira")
plt.xlabel('Comment-Ratio')
plt.ylabel('Total count')

plt.bar(name,count)
```

```
<BarContainer object of 2 artists>
```



```
value1=df5['CLASS'].value_counts()
value2=df5['CLASS'].value_counts()
value3=df5['CLASS'].value_counts()
value4=df5['CLASS'].value_counts()
value5=df5['CLASS'].value_counts()
box_plot_data = [value1, value2, value3, value4, value5]

plt.boxplot(box_plot_data,patch_artist=True,labels = ['Psy' , 'KatyPerry','LMFAO','Eminem','Shakira'])
plt.show()
```



Preprocessing

```
frames = [df1,df2,df3,df4,df5]
```

```
df_mearged = pd.concat(frames)
```

```
df_mearged
```

	COMMENT_ID	AUTHOR	DATE	CONTENT	CLASS
0	LZQPQhLyRh80UYxNuaDWhIGQYNQ96IuCg-AYWqNPjpU	Julius NM	2013-11-07T06:20:48	Huh, anyway check out this you[tube] channel: ...	1
1	LZQPQhLyRh_C2cTtd9MvFRJedxydaVW-2sNg5Diuo4A	adam riyati	2013-11-07T12:37:15	Hey guys check out my new channel and our firs...	1
2	LZQPQhLyRh9MSZYnf8djyk0gEF9BHDPYrrK-qCczIY8	Evgeny Murashkin	2013-11-08T17:34:21	just for test I have to say murdev.com	1

```
# total size
df_mearged.shape
```

```
(1956, 5)
```

```
# mearging with keys
keys = ["Psy","KatyPerry","LMFAO","Eminem","Shakira"]
df_with_keys = pd.concat(frames,keys = keys)
df_with_keys
```

		COMMENT_ID	AUTHOR	DATE	CONTENT	CLASS
Psy	0	LZQPQhLyRh80UYxNuaDWhIGQYNQ96IuCg-	Julius NM	2013-11-	Huh, anyway check out this	1

```
# checking for only comments on psy
df_with_keys.loc["Psy"]
```

	COMMENT_ID	AUTHOR	DATE	CONTENT	CLASS
0	LZQPQhLyRh80UYxNuaDWhIGQYNQ96IuCg-AYWqNPjpU	Julius NM	2013-11-07T06:20:48	Huh, anyway check out this you[tube] channel: ...	1
1	LZQPQhLyRh_C2cTtd9MvFRJedxydaVW-2sNg5Diuo4A	adam riyati	2013-11-07T12:37:15	Hey guys check out my new channel and our firs...	1
2	LZQPQhLyRh9MSZYnf8djyk0gEF9BHDPYrrK-qCczIY8	Evgeny Murashkin	2013-11-08T17:34:21	just for test I have to say murdev.com	1
3	z13jhp0bxqncu512g22wvzkasxmvvzjaz04	ElNino Melendez	2013-11-09T08:28:43	me shaking my sexy ass on my channel enjoy ^_^	1
4	z13fwbwp1oujthgqj04chlngpvzmtt3r3dw	GsMega	2013-11-10T16:05:38	watch?v=vtaRGgvGtWQ Check this out .	1
...	...	...	...	...	...
345	z13th1q4yzihf1bll23qxzpjeujterydj	Carmen Racasanu	2014-11-14T13:27:52	How can this have 2 billion views when there's...	0
346	z13fcn1wfpb5e51xe04chdxakpzgchyaxzo0k	diego mogrovejo	2014-11-14T13:28:08	I don't now why I'm watching this in 2014	0

```
# save and write mearge data to a csv file
df_with_keys.to_csv("YoutubeSpamMergedData01.csv")
```

Data Visualization after Preprocessing

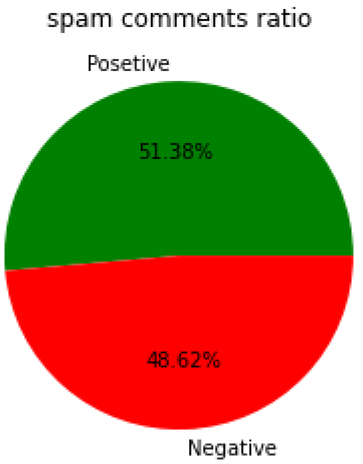
```
# getting data from mearge dataset.

df= pd.read_csv("YoutubeSpamMergedData01.csv")
df
```

	Unnamed: 0	Unnamed: 1	COMMENT_ID	AUTHOR	DATE	CONT
0	Psy	0	LZQPQhLyRh80UYxNuaDWhIGQYNQ96IuCg-AYWqNPjpU	Julius NM	2013-11-07T06:20:48	Huh, any check out you[t channe
1	Psy	1	LZQPQhLyRh_C2cTtd9MvFRJedxydaVW-2sNg5Diuo4A	adam riyati	2013-11-07T12:37:15	Hey guys cl out my channel anc f
2	Psy	2	LZQPQhLyRh9MSZYnf8djyk0gEF9BHDPYrrK-qCczIY8	Evgeny Murashkin	2013-11-08T17:34:21	just for t have to murdev.
3	Psy	3	z13jhp0bxqncu512g22wvzkasxmvvzjaz04	ElNino Melendez	2013-11-09T08:28:43	me shaking sexy ass or channel e
4	Psy	4	z13fwbwp1oujthgqj04chlngpvzmtt3r3dw	GsMega	2013-11-10T16:05:38	wa v=vtaRGgvG Check this
...	...	...	...	...	...	
1951	Shakira	365	_2viQ_Qnc6-bMSjqyL1NKj57ROicCSJV5SwTrw-RFFA	Katie Mettam	2013-07-13T13:27:39.441000	I love this s because we it at Camp
1952	Shakira	366	_2viQ_Qnc6-pY-1yR6K2FhmC5i48-WuNx5CumlHLDAI	Sabina Pearson-	2013-07-13T13:14:30.021000	I love this s for two reas

```
#data size
df.size
```

```
    13692
```

```
slices = df['CLASS'].value_counts()
activity = ['Posetive' , 'Negative']
cols = ['g','r']

plt.pie(slices,
        labels = activity,
        colors = cols,
        startangle = 0,
        shadow = False,
        explode = (0,0),
        autopct = "%1.2f%%",
        radius = 1)

plt.title('spam comments ratio')
plt.show()
```



Data cleaning

```
# checking for consistent column name
df.columns
```

```
Index(['Unnamed: 0', 'Unnamed: 1', 'COMMENT_ID', 'AUTHOR', 'DATE', 'CONTENT',
       'CLASS'],
      dtype='object')
```

```
# checking data types
df.dtypes
```

```
Unnamed: 0    object
Unnamed: 1     int64
COMMENT_ID    object
AUTHOR        object
DATE          object
CONTENT       object
CLASS          int64
dtype: object
```

```
# checking for missing nan
df.isnull().sum()
```

```
Unnamed: 0      0
Unnamed: 1      0
COMMENT_ID      0
AUTHOR          0
DATE          245
CONTENT         0
CLASS           0
dtype: int64
```

```
# check for date
df['DATE']
```

```
0              2013-11-07T06:20:48
1              2013-11-07T12:37:15
2              2013-11-08T17:34:21
3              2013-11-09T08:28:43
4              2013-11-10T16:05:38
                        ...
1951    2013-07-13T13:27:39.441000
1952    2013-07-13T13:14:30.021000
1953    2013-07-13T12:09:31.188000
1954    2013-07-13T11:17:52.308000
1955    2013-07-12T22:33:27.916000
Name: DATE, Length: 1956, dtype: object
```

```
# getting author details
df.AUTHOR
# if i convert the auther name to first and last bname then
#df[["FIRSTNAME"],["LASTNAME"]] = df['AUTHOR'].str.split(expand=True)
```

```
0                 Julius NM
1                adam riyati
2           Evgeny Murashkin
3            ElNino Melendez
4                     GsMega
               ...
1951            Katie Mettam
1952    Sabina Pearson-Smith
1953           jeffrey jules
1954          Aishlin Maciel
1955             Latin Bosch
Name: AUTHOR, Length: 1956, dtype: object
```

```
## working with text content
df_data = df[['CONTENT','CLASS']]
# to see those values content =  comments && class = true/false
df_data
```

	CONTENT	CLASS
0	Huh, anyway check out this you[tube] channel: ...	1
1	Hey guys check out my new channel and our firs...	1
2	just for test I have to say murdev.com	1
3	me shaking my sexy ass on my channel enjoy ^_^	1
4	watch?v=vtaRGgvGtWQ Check this out .	1
...	...	...
1951	I love this song because we sing it at Camp al...	0
1952	I love this song for two reasons: 1.it is abou...	0
1953	wow	0
1954	Shakira u are so wiredo	0
1955	Shakira is the best dancer	0

```
# to see new dataset coluimns
df_data.columns
```

```
Index(['CONTENT', 'CLASS'], dtype='object')
```

```
# inserting data inn x,y for visualization
df_x = df_data['CONTENT']
df_y = df_data['CLASS']
```

Feature Selection

```
### Feature Extraction From Text
```

```
#1 CountVectorizer
```

```
#2 TfidfVectorizer

cv = CountVectorizer()

ex = cv.fit_transform(["Great song but check this out","What is this song"])

# convertion to arry
ex.toarray()
```

```
array([[1, 1, 1, 0, 1, 1, 1, 0],
       [0, 0, 0, 1, 0, 1, 1, 1]])
```

```
# gettingh feature name
cv.get_feature_names()
```

```
/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function get_feature_names is de
  warnings.warn(msg, category=FutureWarning)
['but', 'check', 'great', 'is', 'out', 'song', 'this', 'what']
```

Feature Extraction and Feature Engineering

```
# extrat feature with CountVectorizer
corpus = df_x
cv = CountVectorizer()
X = cv.fit_transform(corpus)
```

```
# convertingf x to an aray
X.toarray()
```

```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]])
```

```
# get the feature names
cv.get_feature_names()
```

```
/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function get_feature_names is
  warnings.warn(msg, category=FutureWarning)
['00',
 '000',
 '002',
 '018',
 '02',
 '034',
 '04',
 '047000',
 '05',
 '053012',
 '0687119038',
 '08',
 '09',
 '0cb8qfjaa',
 '0d878a889c',
 '0dbhjzdw0lbsjbi40gxm0d0p5krhv8xinqli53__wqbahs8zx4mjhw5vwrkpxfoeks',
 '0laviqu2b',
 '10',
 '100',
 '1000',
 '10000000',
 '1000000000',
 '100000415527985',
 '100005244783212',
 '100007085325116',
 '10001',
 '100877300245414',
 '101721377578919894134',
 '10200253113705769',
 '1030',
 '10499962146104962510',
 '10626048',
 '10626835',
 '106865403',
 '107297364',
 '1073741825',
 '1073741828',
 '1073741830',
 '1073741943',
 '108k',
 '109',
 '10b35481',
 '11',
 '1111',
 '111111111111111111',
 '111719098841907',
 '111982027348137311818',
 '112720997191206369631',
 '11cpwb',
 '11th',
 '12',
 '123',
 '124',
 '124923004',
 '126'
```

Model Building

```
# module building
from sklearn.model_selection import train_test_split
```

```
#training
X_train,X_test,y_train,y_test = train_test_split(X,df_y,test_size=0.33,random_state = 42)
```

```
# see X_train
X_train
```

```
    <1310x4454 sparse matrix of type '<class 'numpy.int64'>'
```

```
            with 17525 stored elements in Compressed Sparse Row format>
```

Analyzer and apply algorithm

```
from sklearn.neighbors import KNeighborsClassifier,KNeighborsRegressor
KNNC = KNeighborsClassifier()
KNNC.fit(X_train,y_train)
print(f"Train Accuracy of model {KNNC.score(X_train,y_train)*100} %")
# acuracy of our model
print(f"Test Accuracy of model {KNNC.score(X_test,y_test)*100} %")
```

```
    Train Accuracy of model 90.53435114503817 %
    Test Accuracy of model 89.00928792569658 %
```

```
from sklearn.tree import DecisionTreeClassifier, DecisionTreeRegressor
dtc = DecisionTreeClassifier()
dtc.fit(X_train,y_train)
print(f"Train Accuracy of model {dtc.score(X_train,y_train)*100} %")
# acuracy of our model
print(f"Test Accuracy of model {dtc.score(X_test,y_test)*100} %")
```

```
    Train Accuracy of model 100.0 %
    Test Accuracy of model 95.20123839009288 %
```

```
from sklearn.ensemble import RandomForestClassifier, RandomForestRegressor
Rfc= RandomForestClassifier()
Rfc.fit(X_train,y_train)
print(f"Train Accuracy of model {Rfc.score(X_train,y_train)*100} %")
# acuracy of our model
print(f"Test Accuracy of model {Rfc.score(X_test,y_test)*100} %")
```

```
    Train Accuracy of model 100.0 %
    Test Accuracy of model 95.6656346749226 %
```

```
from sklearn.svm import SVC
from pandas.core.common import random_state
svc = SVC(random_state=101)
svc.fit(X_train,y_train)
print(f"Train Accuracy of model {svc.score(X_train,y_train)*100} %")
# acuracy of our model
print(f"Test Accuracy of model {svc.score(X_test,y_test)*100} %")
```

```
    Train Accuracy of model 96.94656488549617 %
    Test Accuracy of model 93.96284829721363 %
```

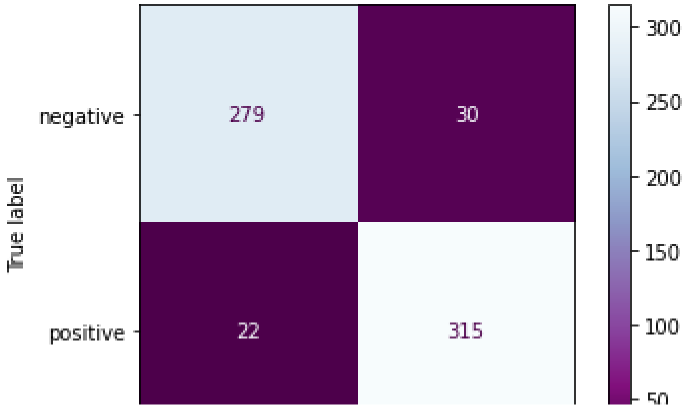
```
# Naive Bayes Classifire
from sklearn.naive_bayes import MultinomialNB
clf = MultinomialNB()
clf.fit(X_train,y_train)
print(f"Train Accuracy of model {clf.score(X_train,y_train)*100} %")
# acuracy of our model
print(f"Test Accuracy of model {clf.score(X_test,y_test)*100} %")
```

```
    Train Accuracy of model 96.18320610687023 %
    Test Accuracy of model 91.95046439628483 %
```

Confusion Matrix

```
from sklearn.metrics import plot_confusion_matrix
import matplotlib.pyplot as plt
plot_confusion_matrix(clf,X_test,y_test,cmap='BuPu_r',display_labels=['negative','positive'])
plt.show()
```

```
/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function plot_confusion_ma
  warnings.warn(msg, category=FutureWarning)
```



Predict & Output

```
## predict with our model
clf.predict(X_test)
```

```
array([0, 0, 0, 1, 1, 0, 1, 1, 0, 1, 1, 0, 1, 0, 0, 1, 1, 0, 1, 0, 1, 0,
       1, 1, 1, 0, 0, 0, 0, 1, 1, 1, 1, 0, 1, 1, 1, 1, 0, 0, 0, 1, 0, 1,
       1, 1, 1, 1, 0, 1, 1, 0, 1, 1, 0, 0, 1, 0, 1, 1, 1, 1, 1, 1, 0, 0,
       0, 1, 0, 1, 0, 1, 1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 1,
       1, 1, 0, 1, 1, 0, 0, 0, 1, 0, 0, 1, 1, 1, 1, 0, 0, 0, 1, 1, 1, 1,
       0, 1, 0, 1, 0, 0, 0, 1, 0, 1, 1, 1, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1,
       1, 0, 1, 0, 1, 1, 0, 1, 1, 1, 1, 0, 1, 0, 1, 0, 1, 1, 0, 0, 0, 1,
       1, 1, 1, 1, 1, 0, 1, 1, 0, 1, 1, 1, 0, 1, 1, 1, 0, 0, 0, 1, 0, 1,
       0, 1, 1, 1, 0, 1, 0, 0, 1, 1, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 1, 0,
       1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 1, 1, 0, 1, 0, 1, 1, 0, 1, 0,
       1, 1, 0, 1, 1, 0, 0, 1, 1, 0, 0, 1, 0, 1, 1, 1, 1, 1, 0, 0, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 1, 0, 1, 0, 0, 1, 1, 1, 0, 1, 1, 1,
       1, 1, 0, 0, 0, 1, 1, 1, 1, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 0, 0,
       1, 0, 0, 1, 1, 0, 0, 1, 1, 1, 1, 1, 1, 0, 0, 1, 0, 0, 0, 1, 1, 1,
       0, 0, 0, 1, 1, 1, 1, 0, 1, 1, 0, 1, 0, 1, 0, 0, 1, 1, 1, 1, 0, 1,
       1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 0, 1, 0, 0, 0,
       1, 1, 0, 1, 0, 1, 1, 1, 1, 0, 1, 1, 1, 0, 1, 0, 1, 1, 0, 1, 1, 1,
       1, 0, 0, 0, 1, 1, 1, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       1, 1, 1, 0, 1, 0, 1, 1, 0, 1, 0, 0, 1, 1, 1, 1, 1, 0, 1, 1, 0, 1,
       0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 1, 1, 0, 1, 1, 0,
       0, 1, 1, 0, 0, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 0, 1, 0, 0, 0, 1, 1,
       1, 1, 0, 1, 1, 1, 0, 0, 1, 0, 0, 1, 0, 0, 1, 1, 0, 1, 0, 1, 1, 1,
       1, 1, 0, 1, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 1, 0, 0,
       0, 0, 1, 0, 0, 1, 1, 0, 0, 1, 1, 0, 0, 0, 1, 1, 0, 1, 0, 1, 0, 0,
       0, 0, 1, 0, 1, 0, 1, 0, 0, 1, 1, 0, 1, 1, 1, 0, 0, 1, 1, 0, 0, 1,
       0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 0, 1, 1, 1, 0, 0, 1, 0,
       1, 0, 1, 0, 1, 0, 0, 0, 1, 1, 1, 0, 0, 1, 0, 1, 0, 0, 1, 1, 1, 1,
       1, 0, 0, 1, 1, 1, 1, 1, 0, 0, 0, 0, 1, 0, 1, 1, 1, 0, 0, 1, 0, 0,
       0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 0, 0, 0, 1, 1, 1, 1, 0, 1, 1, 0,
       1, 1, 1, 0, 1, 0, 0, 0])
```

Testing

```
## TEST 1
```

```
# a simple prediction 1
comment = ["Check this out"]
vect = cv.transform(comment).toarray()
vect
```

```
    array([[0, 0, 0, ..., 0, 0, 0]])
```

```
clf.predict(vect)
```

```
    array([1])
```

```
class_dict = {"Not Spam":0,"Spam":1}
class_dict.values()
```

```
    dict_values([0, 1])
```

```
if clf.predict(vect) == 1:
    print("Spam")
```

```
else:
    print("Not Spam")
```

```
 Spam
```

```
## TEST 2
```

```
# simple Prerdiction 2
comment1 = [str(input())]
vect = cv.transform(comment1).toarray()
print(clf.predict(vect))
if clf.predict(vect) == 1:
    print("Spam")
else:
    print("Not Spam")
```

```
 good song
 [0]
 Not Spam
```

Save The model

```
import pickle as pk
```

```
naivebayesML = open("YtbSpam_model.pkl","wb")
```

```
pk.dump(clf,naivebayesML)
```

```
naivebayesML.close()
```

```
## load the model
```

```
ytb_model = open("YtbSpam_model.pkl","rb")

new_model = pk.load(ytb_model)
```

```
new_model
```

```
MultinomialNB()
```

Double-click (or enter) to edit

● ×