In [1]:
```
pip install numpy pandas sklearn
```

```
Requirement already satisfied: numpy in c:\users\admin\anaconda3\lib\site-packa
ges (1.19.2)Note: you may need to restart the kernel to use updated packages.
Requirement already satisfied: pandas in c:\users\admin\anaconda3\lib\site-pack
ages (1.1.3)
Collecting sklearn
  Downloading sklearn-0.0.tar.gz (1.1 kB)
Requirement already satisfied: pytz>=2017.2 in c:\users\admin\anaconda3\lib\sit
e-packages (from pandas) (2020.1)
Requirement already satisfied: python-dateutil>=2.7.3 in c:\users\admin\anacond
a3\lib\site-packages (from pandas) (2.8.1)
Requirement already satisfied: scikit-learn in c:\users\admin\anaconda3\lib\sit
e-packages (from sklearn) (0.23.2)
Requirement already satisfied: six>=1.5 in c:\users\admin\anaconda3\lib\site-pa
ckages (from python-dateutil>=2.7.3->pandas) (1.15.0)
Requirement already satisfied: joblib>=0.11 in c:\users\admin\anaconda3\lib\sit
e-packages (from scikit-learn->sklearn) (0.17.0)
Requirement already satisfied: threadpoolctl>=2.0.0 in c:\users\admin\anaconda3
\lib\site-packages (from scikit-learn->sklearn) (2.1.0)
Requirement already satisfied: scipy>=0.19.1 in c:\users\admin\anaconda3\lib\si
te-packages (from scikit-learn->sklearn) (1.5.2)
Building wheels for collected packages: sklearn
  Building wheel for sklearn (setup.py): started
  Building wheel for sklearn (setup.py): finished with status 'done'
  Created wheel for sklearn: filename=sklearn-0.0-py2.py3-none-any.whl size=132
1 sha256=ae967291ba209ffd22897875fe79b589cf2dece94105017f743d239ca4255956
  Stored in directory: c:\users\admin\appdata\local\pip\cache\wheels\22\0b\40\f
d3f795caaa1fb4c6cb738bc1f56100be1e57da95849bfc897
Successfully built sklearn
Installing collected packages: sklearn
Successfully installed sklearn-0.0
```

In [2]:
```
import numpy as np
import pandas as pd
import itertools
from sklearn.model_selection import train_test_split
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.linear_model import PassiveAggressiveClassifier
from sklearn.metrics import accuracy_score, confusion_matrix
```

In [9]:
```
#read the data
import pandas as pd
df=pd.read_csv('C:\\Users\\Admin\\Downloads\\news.csv')
#Get shape and head
df.shape
df.head()
```

Out[9]:

	Unnamed: 0	title	text	label
0	8476	You Can Smell Hillary's Fear	Daniel Greenfield, a Shillman Journalism Fello...	FAKE
1	10294	Watch The Exact Moment Paul Ryan Committed Pol...	Google Pinterest Digg Linkedin Reddit Stumbleu...	FAKE
2	3608	Kerry to go to Paris in gesture of sympathy	U.S. Secretary of State John F. Kerry said Mon...	REAL
3	10142	Bernie supporters on Twitter erupt in anger ag...	— Kaydee King (@KaydeeKing) November 9, 2016 T...	FAKE
4	875	The Battle of New York: Why This Primary Matters	It's primary day in New York and front-runners...	REAL

In [10]:
```
#GEt Labels
labels=df.label
labels.head()
```

Out[10]:
```
0    FAKE
1    FAKE
2    REAL
3    FAKE
4    REAL
Name: label, dtype: object
```

In [15]:
```
#split the dataset
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(df['text'], labels, test_size=0.2,
```

In [16]:
```
#Initialize a TfidfVectorizer
from sklearn.feature_extraction.text import TfidfVectorizer
tfidf_vectorizer=TfidfVectorizer(stop_words='english', max_df=0.7)
# Fit and transform train set, transform test set
tfidf_train=tfidf_vectorizer.fit_transform(x_train)
tfidf_test=tfidf_vectorizer.transform(x_test)
```

In [18]:
```
 #Initialize a PassiveAggressiveClassifier
from sklearn.linear_model import PassiveAggressiveClassifier
pac=PassiveAggressiveClassifier(max_iter=50)
pac.fit(tfidf_train,y_train)
#Predict on the test set and calculate accuracy
from sklearn.metrics import accuracy_score, confusion_matrix
y_pred=pac.predict(tfidf_test)
score=accuracy_score(y_test,y_pred)
print(f'Accuracy: {round(score*100,2)}%')
```

```
Accuracy: 92.98%
```

In [20]:
```
 #Build confusion matrix
confusion_matrix(y_test,y_pred, labels=['FAKE','REAL'])
```

Out[20]:
```
array([[590,  48],
       [ 41, 588]], dtype=int64)
```

In [ ]:
```

```