

# Experiment

## Aim - Fake News Detection

## Code and Output -

### Importing the necessary libraries

```
In [1]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import nltk
from nltk.stem import PorterStemmer
from nltk.corpus import stopwords
from nltk.stem import WordNetLemmatizer
import re
import string
%matplotlib inline
```

### Reading the .csv files

```
In [39]: df_fake = pd.read_csv('Fake.csv')
df_fake.head()
```

Out[39]:

	title	text	subject	date
0	Donald Trump Sends Out Embarrassing New Year'...	Donald Trump just couldn t wish all Americans ...	News	December 31, 2017
1	Drunk Bragging Trump Staffer Started Russian ...	House Intelligence Committee Chairman Devin Nu...	News	December 31, 2017
2	Sheriff David Clarke Becomes An Internet Joke...	On Friday, it was revealed that former Milwauk...	News	December 30, 2017
3	Trump Is So Obsessed He Even Has Obama's Name...	On Christmas day, Donald Trump announced that ...	News	December 29, 2017
4	Pope Francis Just Called Out Donald Trump Dur...	Pope Francis used his annual Christmas Day mes...	News	December 25, 2017

```
In [40]: df_true = pd.read_csv('True.csv')
df_true.head()
```

Out[40]:

	title	text	subject	date
0	As U.S. budget fight looms, Republicans flip t...	WASHINGTON (Reuters) - The head of a conservat...	politicsNews	December 31, 2017
1	U.S. military to accept transgender recruits o...	WASHINGTON (Reuters) - Transgender people will...	politicsNews	December 29, 2017
2	Senior U.S. Republican senator: 'Let Mr. Muell...	WASHINGTON (Reuters) - The special counsel inv...	politicsNews	December 31, 2017
3	FBI Russia probe helped by Australian diplomat...	WASHINGTON (Reuters) - Trump campaign adviser ...	politicsNews	December 30, 2017
4	Trump wants Postal Service to charge 'much mor...	SEATTLE/WASHINGTON (Reuters) - President Donal...	politicsNews	December 29, 2017

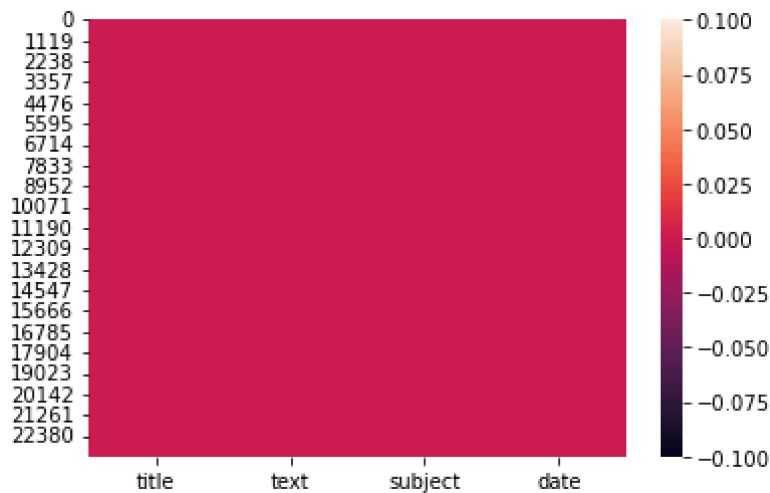
## Data Preprocessing

```
In [41]: df_fake.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 23481 entries, 0 to 23480
Data columns (total 4 columns):
#   Column   Non-Null Count  Dtype
---  -
0    title    23481 non-null  object
1    text     23481 non-null  object
2    subject  23481 non-null  object
3    date     23481 non-null  object
dtypes: object(4)
memory usage: 733.9+ KB
```

```
In [42]: sns.heatmap(df_fake.isnull())
```

```
Out[42]: <AxesSubplot:>
```



```
In [43]: df_fake.describe()
```

```
Out[43]:
```

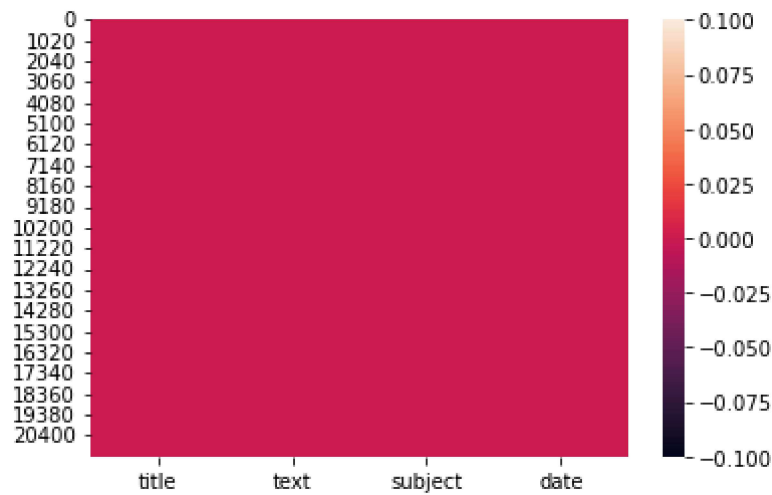
	title	text	subject	date
count	23481	23481	23481	23481
unique	17903	17455	6	1681
top	MEDIA IGNORES Time That Bill Clinton FIRED His...		News	May 10, 2017
freq	6	626	9050	46

```
In [44]: df_true.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 21417 entries, 0 to 21416
Data columns (total 4 columns):
#   Column   Non-Null Count  Dtype  
---  -
0   title    21417 non-null  object 
1   text     21417 non-null  object 
2   subject  21417 non-null  object 
3   date     21417 non-null  object 
dtypes: object(4)
memory usage: 669.4+ KB
```

```
In [45]: sns.heatmap(df_true.isnull())
```

```
Out[45]: <AxesSubplot:>
```



```
In [46]: df_true.describe()
```

```
Out[46]:
```

	title	text	subject	date
count	21417	21417	21417	21417
unique	20826	21192	2	716
top	Factbox: Trump fills top jobs for his administ...	(Reuters) - Highlights for U.S. President Dona...	politicsNews	December 20, 2017
freq	14	8	11272	182

```
In [47]: df_fake['Result'] = 0
df_true['Result'] = 1
```

```
In [48]: df_fake.head()
```

```
Out[48]:
```

	title	text	subject	date	Result
0	Donald Trump Sends Out Embarrassing New Year'...	Donald Trump just couldn t wish all Americans ...	News	December 31, 2017	0
1	Drunk Bragging Trump Staffer Started Russian ...	House Intelligence Committee Chairman Devin Nu...	News	December 31, 2017	0
2	Sheriff David Clarke Becomes An Internet Joke...	On Friday, it was revealed that former Milwauk...	News	December 30, 2017	0
3	Trump Is So Obsessed He Even Has Obama's Name...	On Christmas day, Donald Trump announced that ...	News	December 29, 2017	0
4	Pope Francis Just Called Out Donald Trump Dur...	Pope Francis used his annual Christmas Day mes...	News	December 25, 2017	0

```
In [49]: df_true.head()
```

```
Out[49]:
```

	title	text	subject	date	Result
0	As U.S. budget fight looms, Republicans flip t...	WASHINGTON (Reuters) - The head of a conservat...	politicsNews	December 31, 2017	1
1	U.S. military to accept transgender recruits o...	WASHINGTON (Reuters) - Transgender people will...	politicsNews	December 29, 2017	1
2	Senior U.S. Republican senator: 'Let Mr. Muell...	WASHINGTON (Reuters) - The special counsel inv...	politicsNews	December 31, 2017	1
3	FBI Russia probe helped by Australian diplomat...	WASHINGTON (Reuters) - Trump campaign adviser ...	politicsNews	December 30, 2017	1
4	Trump wants Postal Service to charge 'much mor...	SEATTLE/WASHINGTON (Reuters) - President Donal...	politicsNews	December 29, 2017	1

```
In [50]: df = pd.concat([df_fake,df_true])
```

```
In [51]: df.head()
```

```
Out[51]:
```

	title	text	subject	date	Result
0	Donald Trump Sends Out Embarrassing New Year'...	Donald Trump just couldn t wish all Americans ...	News	December 31, 2017	0
1	Drunk Bragging Trump Staffer Started Russian ...	House Intelligence Committee Chairman Devin Nu...	News	December 31, 2017	0
2	Sheriff David Clarke Becomes An Internet Joke...	On Friday, it was revealed that former Milwauk...	News	December 30, 2017	0
3	Trump Is So Obsessed He Even Has Obama's Name...	On Christmas day, Donald Trump announced that ...	News	December 29, 2017	0
4	Pope Francis Just Called Out Donald Trump Dur...	Pope Francis used his annual Christmas Day mes...	News	December 25, 2017	0

```
In [52]: print(df_fake.shape)
print(df_true.shape)
print(df.shape)
```

```
(23481, 5)
(21417, 5)
(44898, 5)
```

```
In [53]: df.columns
```

```
Out[53]: Index(['title', 'text', 'subject', 'date', 'Result'], dtype='object')
```

```
In [54]: df = df.drop(['title', 'subject', 'date'], axis=1)
df.head()
```

```
Out[54]:
```

	text	Result
0	Donald Trump just couldn t wish all Americans ...	0
1	House Intelligence Committee Chairman Devin Nu...	0
2	On Friday, it was revealed that former Milwauk...	0
3	On Christmas day, Donald Trump announced that ...	0
4	Pope Francis used his annual Christmas Day mes...	0

```
In [55]: df = df.sample(frac=1)
df.head()
```

Out[55]:

	text	Result
11030	NEW YORK (Reuters) - The 2016 contenders for t...	1
14763	BEIRUT (Reuters) - Lebanese President Michel A...	1
7590	SAN FRANCISCO (Reuters) - A federal judge in C...	1
8539	NEW YORK (Reuters) - Billionaire investor Wilb...	1
20071	BRUSSELS (Reuters) - The European Union s exec...	1

```
In [56]: df.reset_index(inplace=True)
```

```
In [57]: df.head()
```

Out[57]:

	index	text	Result
0	11030	NEW YORK (Reuters) - The 2016 contenders for t...	1
1	14763	BEIRUT (Reuters) - Lebanese President Michel A...	1
2	7590	SAN FRANCISCO (Reuters) - A federal judge in C...	1
3	8539	NEW YORK (Reuters) - Billionaire investor Wilb...	1
4	20071	BRUSSELS (Reuters) - The European Union s exec...	1

```
In [58]: df.drop(['index'],axis=1,inplace=True)
```

```
In [59]: df.head()
```

Out[59]:

	text	Result
0	NEW YORK (Reuters) - The 2016 contenders for t...	1
1	BEIRUT (Reuters) - Lebanese President Michel A...	1
2	SAN FRANCISCO (Reuters) - A federal judge in C...	1
3	NEW YORK (Reuters) - Billionaire investor Wilb...	1
4	BRUSSELS (Reuters) - The European Union s exec...	1

## Task of NLP Comes Here

**Step - 1 : Convert the text in lowercase and remove the extra space, special chr., ulr and links.**

```
In [60]: def wordopt(text):
text = text.lower()
text = re.sub('[\.\*\?\,\']', '', text)
text = re.sub("\W", " ", text)
text = re.sub('https?://\S+|www\.\S+', '', text)
text = re.sub('<.*?>+', '', text)
text = re.sub('[%s]' % re.escape(string.punctuation), '', text)
text = re.sub('\n', '', text)
text = re.sub('\w*\d\w*', '', text)
return text
```

```
In [61]: df['text'] = df['text'].apply(wordopt)
```

```
In [62]: df.head()
```

Out[62]:

	text	Result
0	new york reuters the contenders for the w...	1
1	beirut reuters lebanese president michel a...	1
2	san francisco reuters a federal judge in c...	1
3	new york reuters billionaire investor wilb...	1
4	brussels reuters the european union s exec...	1

## Step - 2: Tokenization

## Step - 3: Removal of Stop Words

## Step - 4: Stemming and Lemmatization

```
In [63]: def nlpSteps(text):
tokens = nltk.word_tokenize(text)
stop_words = stopwords.words('english')
txt_no_stopwords = [word for word in tokens if word not in stop_words]
lemmatizer = WordNetLemmatizer()
lemmatized_words = []
for w in txt_no_stopwords:
    lemmatized_words.append(lemmatizer.lemmatize(w))
text = " ".join(lemmatized_words)
return text
```

```
In [64]: df['text'] = df['text'].apply(nlpSteps)
```



```
In [65]: df.head()
```

```
Out[65]:
```

	text	Result
0	new york reuters contender white house used so...	1
1	beirut reuters lebanese president michel aoun ...	1
2	san francisco reuters federal judge california...	1
3	new york reuters billionaire investor wilbur r...	1
4	brussels reuters european union executive offe...	1

### Creation of TDIF Vectors

```
In [66]: from sklearn.feature_extraction.text import TfidfVectorizer  
vectors = TfidfVectorizer()  
x = vectors.fit_transform(df['text'])
```

### Fitting it into ML Model (Neural Networks - Schocastic Gradient Descent) and Calculating its Accuracy

```

In [67]: from sklearn.linear_model import SGDClassifier
from sklearn.model_selection import KFold
from sklearn.metrics import accuracy_score, precision_score, recall_score, f1_score
#from sklearn.model_selection import cross_val_score
sgd = SGDClassifier(loss="hinge", penalty="l2", max_iter=20)
y = df['Result']
#for folds in range(2,16):
#    scores = cross_val_score(sgd,x,df['Result'],cv=folds)
#    print(f'Cross validation score for {folds} folds: {scores.mean():.4f}')
kf = KFold(n_splits=10)
a_scores = []
p_scores = []
r_scores = []
f_scores = []
for train, test in kf.split(x,y):
    x_train = x[train]
    x_test = x[test]
    y_train = y[train]
    y_test = y[test]
    sgd.fit(x_train,y_train)
    y_pred = sgd.predict(x_test)
    a_scores.append(accuracy_score(y_test,y_pred))
    p_scores.append(precision_score(y_test,y_pred))
    r_scores.append(recall_score(y_test,y_pred))
    f_scores.append(f1_score(y_test,y_pred))
a_scores = np.array(a_scores)
p_scores = np.array(p_scores)
r_scores = np.array(r_scores)
f_scores = np.array(f_scores)
print('Accuracy Score of the model: ',np.mean(a_scores))
print("Precision Score of the model:",np.mean(p_scores))
print("Recall Score of the model:",np.mean(r_scores))
print('F1-Score of the model:',np.mean(f_scores))

```

Accuracy Score of the model: 0.990088680025065  
 Precision Score of the model: 0.9879499648246309  
 Recall Score of the model: 0.9913125884388201  
 F1-Score of the model: 0.9896236090528412

**Its Time For Manual Testing!!!**

```
In [68]: def output_labels(n):
        if(n==0):
            return 'Fake News'
        else:
            return 'Not A Fake News'
def manual_testing(news):
    testing_news = {'text':[news]}
    new_def_test = pd.DataFrame(testing_news)
    new_def_test['text'] = new_def_test['text'].apply(wordopt)
    new_def_test['text'] = new_def_test['text'].apply(nlpSteps)
    new_xv_test = vectors.transform(new_def_test['text'])
    prediction = sgd.predict(new_xv_test)
    return print('Prediction:',output_labels(prediction))
```

```
In [69]: news = str(input())
manual_testing(news)
```

Paul Craig Roberts

In the last years of the 20th century fraud entered US foreign policy in a new way. On false pretenses Washington dismantled Yugoslavia and Serbia in order to advance an undeclared agenda. In the 21st century this fraud multiplied many times. Afghanistan, Iraq, Somalia, and Libya were destroyed, and Iran and Syria would also have been destroyed if the President of Russia had not prevented it. Washington is also behind the current destruction of Yemen, and Washington has enabled and financed the Israeli destruction of Palestine. Additionally, Washington operated militarily within Pakistan without declaring war, murdering many women, children, and village elders under the guise of combating terrorism. Washington's war crimes rival those of any country in history. I have documented these crimes in my columns and books (Clarity Press). Anyone who still believes in the purity of Washington's foreign policy is a lost soul. Russia and China now have a strategic alliance that is too strong for Washington. Russia and China will prevent Washington from further encroachments on their security and national interests. Those countries important to Russia and China will be protected by the alliance. As the world wakes up and sees the evil that the West represents, more countries will seek the protection of Russia and China. America is also failing on the economic front. My columns and my book, *The Failure of Laissez Faire Capitalism*, which has been published in English, Chinese, Korean, Czech, and German, have shown how Washington has stood aside, indeed cheering it on, while the short-term profit interests of management, shareholders, and Wall Street eviscerated the American economy, sending manufacturing jobs, business know-how, and technology, along with professional tradeable skill jobs, to China, India, and other countries, leaving America with such a hollowed out economy that the median family income has been falling for years. Today 50% of 25 year-old Americans are living with their parents or grandparents because they cannot find employment sufficient to sustain an independent existence. This brutal fact is covered up by the prostitute US media, a source of fantasy stories of America's economic recovery. The facts of our existence are so different from what is reported that I am astonished. As a former professor of economics, Wall Street Journal editor and Assistant Secretary of the Treasury for Economic Policy, I am astonished at the corruption that rules in the financial sector, the Treasury, the financial regulatory agencies, and the Federal Reserve. In my day, there would have been indictments and prison sentences of bankers and high government officials. In America today there are no free financial markets. All the markets are rigged by the Federal Reserve and the Treasury. The regulatory agencies, controlled by those the agencies are supposed to regulate, turn a blind eye, and even if they did not, they are helpless to enforce any law, because private interests are more powerful than the law. Even the government's statistical agencies have been corrupted. Inflation measures have been concocted in order to understate inflation. This lie not only saves Washington from paying Social Security cost-of-living adjustments and frees the money for more wars, but also by understating inflation, the government can create real GDP growth by counting inflation as real growth, just as the government creates 5% unemployment by not counting any discouraged workers who have looked for jobs until they can no longer afford the cost of looking and give up. The official unemployment rate is 5%, but no one can find a job. How can the unemployment rate be 5% when half of 25-year olds are living with relatives because they cannot afford an independent existence? As John Williams (shadowfacts) reports, the unemployment rate that includes those Americans who have given up looking for a job because there are no jobs to be found is 23%. The Federal Reserve, a tool

of a small handful of banks, has succeeded in creating the illusion of an economic recovery since June, 2009, by printing trillions of dollars that found their way not into the economy but into the prices of financial assets. Artificially booming stock and bond markets are the presstitute financial media's proof of a booming economy. The handful of learned people that America has left, and it is only a small handful, understand that there has been no recovery from the previous recession and that a new downturn is upon us. John Williams has pointed out that US industrial production, when properly adjusted for inflation, has never recovered its 2008 level, much less its 2000 peak, and has again turned down. The American consumer is exhausted, overwhelmed by debt and lack of income growth. The entire economic policy of America is focused on saving a handful of NY banks, not on saving the American economy. Economists and other Wall Street shills will dismiss the decline in industrial production as America is now a service economy. Economists pretend that these are high-tech services of the New Economy, but in fact waitresses, bartenders, part time retail clerks, and ambulatory health care services have replaced manufacturing and engineering jobs at a fraction of the pay, thus collapsing effective aggregate demand in the US. On occasions when neoliberal economists recognize problems, they blame them on China. It is unclear that the US economy can be revived. To revive the US economy would require the re-regulation of the financial system and the recall of the jobs and US GDP that offshoring gave to foreign countries. It would require, as Michael Hudson demonstrates in his new book, *Killing the Host*, a revolution in tax policy that would prevent the financial sector from extracting economic surplus and capitalizing it in debt obligations paying interest to the financial sector. The US government, controlled as it is by corrupt economic interests, would never permit policies that impinged on executive bonuses and Wall Street profits. Today US capitalism makes its money by selling out the American economy and the people dependent upon it. In freedom and democracy America, the government and the economy serve interests totally removed from the interests of the American people. The sellout of the American people is protected by a huge canopy of propaganda provided by free market economists and financial presstitutes paid to lie for their living. When America fails, so will Washington's vassal states in Europe, Canada, Australia, and Japan. Unless Washington destroys the world in nuclear war, the world will be remade, and the corrupt and dissolute West will be an insignificant part of the new world. Dr. Paul Craig Roberts was Assistant Secretary of the Treasury for Economic Policy and associate editor of the Wall Street Journal. He was columnist for Business Week, Scripps Howard News Service, and Creators Syndicate. He has had many university appointments. His internet columns have attracted a worldwide following. Roberts' latest books are *The Failure of Laissez Faire Capitalism and Economic Dissolution of the West*, *How America Was Lost*, and *The Neoliberal Threat to World Order*. READ MORE NWO NEWS AT: 21st Century Wire NWO Files

Prediction: Fake News

**Conclusion - Fake news detection model has been made successfully with accuracy of 99.08%.**

