

In [1]:

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
from sklearn.metrics import classification_report
import re
import string
```

In [2]:

```
data_fake=pd.read_csv("Fake.csv")
data_true=pd.read_csv("True.csv")
```

In [3]:

```
data_fake.head()
```

Out[3]:

	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 [4]:

```
data_true.head()
```

Out[4]:

	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

In [5]:

```
#now I will insert colum class as a target feature
data_fake["class"]=1
data_true["class"]=1
```

In [6]:

```
data_fake.shape, data_true.shape
```

Out[6]:

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

In [7]:

```
#lets remove the last 10 rows for manual testing
data_fake_manual_testing=data_fake.tail(10)
for i in range(23480, 23470, -1):
    data_fake.drop([i],axis=0,inplace=True)

data_true_manual_testing=data_true.tail(10)
for i in range(21416, 21406, -1):
    data_true.drop([i],axis=0,inplace=True)
```

In [8]:

```
data_fake.shape, data_true.shape
```

Out[8]:

```
((23471, 5), (21407, 5))
```

In [9]:

```
data_fake_manual_testing['class']=0
data_true_manual_testing['class']=1
```

Out[9]:

```
C:\Users\HARISH\AppData\Local\Temp\ipykernel_1216\1676563180.py:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
data_fake_manual_testing['class']=0
C:\Users\HARISH\AppData\Local\Temp\ipykernel_1216\1676563180.py:2: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
data_true_manual_testing['class']=1
```

In [10]:

```
data_fake_manual_testing.head()
```

Out[10]:

	title	text	subject	date	class
23471	Seven Iranians freed in the prisoner swap have...	21st Century Wire says This week, the historic...	Middle-east	January 20, 2016	0
23472	#Hashtag Hell & The Fake Left	By Daryl Chery and Gilbert MercierAll writers ...	Middle-east	January 19, 2016	0
23473	Astroturfing: Journalist Reveals Brainwashing ...	Vic Bishop Waking TimesOur reality is carefull...	Middle-east	January 19, 2016	0
23474	The New American Century: An Era of Fraud	Paul Craig RobertsIn the last years of the 20t...	Middle-east	January 19, 2016	0
23475	Hillary Clinton: 'Israel First' (and no peace ...	Robert Fantina CounterpunchAlthough the United...	Middle-east	January 18, 2016	0

In [11]:

```
data_true_manual_testing.head()
```

Out[11]:

	title	text	subject	date	class
21407	Mata Pires, owner of embattled Brazil builder ...	SAO PAULO (Reuters) - Cesar Mata Pires, the ow...	worldnews	August 22, 2017	1
21408	U.S., North Korea clash at U.N. forum over nuc...	GENEVA (Reuters) - North Korea and the United ...	worldnews	August 22, 2017	1
21409	U.S., North Korea clash at U.N. arms forum on ...	GENEVA (Reuters) - North Korea and the United ...	worldnews	August 22, 2017	1
21410	Headless torso could belong to submarine jour...	COPENHAGEN (Reuters) - Danish police said on T...	worldnews	August 22, 2017	1
21411	North Korea shipments to Syria chemical arms a...	UNITED NATIONS (Reuters) - Two North Korean sh...	worldnews	August 21, 2017	1

In [12]:

```
#merge the data
data_merge=pd.concat([data_fake,data_true],axis=0)
data_merge.head()
```

Out[12]:

	title	text	subject	date	class
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 [13]:

```
#lets merge the true & fake data frame
data_merge.columns
```

Out[13]:

```
Index(['title', 'text', 'subject', 'date', 'class'], dtype='object')
```

In [14]:

```
#lets remove those columns which are not required
data=data_merge.drop(['title','subject','date'],axis=1)
```

In [15]:

```
data.isnull().sum()
```

Out[15]:

```
text      0
class     0
dtype: int64
```

In [16]:

```
#lets do the random shuffling
data=data.sample(frac=1)
data.head()
```

Out[16]:

	text	class
21212	FRANKFURT (Reuters) - Frankfurt's city center...	1
4736	In what's being compared to the infamous Dais...	0
10079	(Reuters) - New Jersey Governor Chris Christie...	1
9262	Secretary of State Rex Tillerson just shut dow...	0
10616	Trump-hating, Bernie Sanders supporter and dom...	0

In [17]:

```
data.reset_index(inplace=True)
data.drop(['index'],axis=1,inplace=True)
```

In [18]:

```
data.columns
```

Out[18]:

```
Index(['text', 'class'], dtype='object')
```

In [19]:

```
data.head()
```

Out[19]:

	text	class
0	FRANKFURT (Reuters) - Frankfurt's city center...	1
1	In what's being compared to the infamous Dais...	0
2	(Reuters) - New Jersey Governor Chris Christie...	1
3	Secretary of State Rex Tillerson just shut dow...	0
4	Trump-hating, Bernie Sanders supporter and dom...	0

In [43]:

```
#lets create the function to process the text
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 [44]:

```
data['text']=data['text'].apply(wordopt)
```

In [45]:

```
x=data['text']
y=data['class']
```

In [46]:

```
x_train, x_test, y_train, y_test = train_test_split(x,y,test_size=0.25)
```

In [47]:

```
from sklearn.feature_extraction.text import TfidfVectorizer
vectorization=TfidfVectorizer()
xv_train=vectorization.fit_transform(x_train)
xv_test=vectorization.transform(x_test)
```

In [48]:

```
from sklearn.linear_model import LogisticRegression
LR=LogisticRegression()
LR.fit(xv_train,y_train)
```

Out[48]:

```
LogisticRegression
LogisticRegression()
```

In [49]:

```
pred_lr=LR.predict(xv_test)
```

In [50]:

```
LR.score(xv_test,y_test)
```

Out[50]:

```
0.9848484848484849
```

In [51]:

```
print(classification_report(y_test,pred_lr))
```

Out[51]:

	precision	recall	f1-score	support
0	0.99	0.98	0.99	5789
1	0.98	0.99	0.98	5431
accuracy			0.98	11220
macro avg	0.98	0.98	0.98	11220
weighted avg	0.98	0.98	0.98	11220

In [52]:

```
from sklearn.tree import DecisionTreeClassifier
DT= DecisionTreeClassifier()
DT.fit(xv_train,y_train)
```

Out[52]:

```
DecisionTreeClassifier
DecisionTreeClassifier()
```

In [53]:

```
pred_dt=DT.predict(xv_test)
```

In [54]:

```
DT.score(xv_test,y_test)
```

Out[54]:

```
0.9944741532976827
```

In [55]:

```
print(classification_report(y_test,pred_dt))
```

Out[55]:

	precision	recall	f1-score	support
0	0.99	1.00	0.99	5789
1	1.00	0.99	0.99	5431
accuracy			0.99	11220
macro avg	0.99	0.99	0.99	11220
weighted avg	0.99	0.99	0.99	11220

In [56]:

```
from sklearn.ensemble import GradientBoostingClassifier
GB= GradientBoostingClassifier(random_state=0)
GB.fit(xv_train,y_train)
```

Out[56]:

```
GradientBoostingClassifier
GradientBoostingClassifier(random_state=0)
```

In [57]:

```
pred_gb=GB.predict(xv_test)
```

In [58]:

```
GB.score(xv_test,y_test)
```

Out[58]:

```
0.9952762923351158
```

In [59]:

```
print(classification_report(y_test,pred_gb))
```

Out[59]:

	precision	recall	f1-score	support
0	1.00	0.99	1.00	5789
1	0.99	1.00	1.00	5431
accuracy			1.00	11220
macro avg	1.00	1.00	1.00	11220
weighted avg	1.00	1.00	1.00	11220

In [60]:

```
from sklearn.ensemble import RandomForestClassifier
RF=RandomForestClassifier(random_state=0)
RF.fit(xv_train,y_train)
```

Out[60]:

```
RandomForestClassifier
RandomForestClassifier(random_state=0)
```

In [61]:

```
pred_rf=RF.predict(xv_test)
```

In [62]:

```
RF.score(xv_test,y_test)
```

Out[62]:

```
0.9875222816399287
```

In [63]:

```
print(classification_report(y_test,pred_rf))
```

Out[63]:

	precision	recall	f1-score	support
0	0.99	0.99	0.99	5789
1	0.99	0.99	0.99	5431
accuracy			0.99	11220
macro avg	0.99	0.99	0.99	11220
weighted avg	0.99	0.99	0.99	11220

In [66]:

```
#write the function
def output_label(n):
    if n==0:
        return "Fake News"
    elif n==1:
        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_x_test = new_def_test["text"]
    new_xv_test = vectorization.transform(new_x_test)
    pred_LR = LR.predict(new_xv_test)
    pred_DT = DT.predict(new_xv_test)
    pred_GB = GB.predict(new_xv_test)
    pred_RF = RF.predict(new_xv_test)

    return print("\n\nLR Prediction: {} \nDT Prediction: {} \nGB Prediction: {} \nRF Prediction: {}".format(output_label(pred_LR[0]),
                                                                                                     output_label(pred_DT[0]),
                                                                                                     output_label(pred_GB[0]),
                                                                                                     output_label(pred_RF[0])))
```

In [69]:

```
news=str(input())
manual_testing(news)
```

Out[69]:

Donald Trump just couldn't wish all Americans a Happy New Year and leave it at that. Instead, he had to give a shout out to his enemies, haters and the very dishonest fake news media. The former reality show star had just one job to do and he couldn't do it. As our Country rapidly grows stronger and smarter, I want to wish all of my friends, supporters, enemies, haters, and even the very dishonest Fake News Media, a Happy and Healthy New Year, President Angry Pants t weested. 2018 will be a great year for America! As our Country rapidly grows stronger and smarter, I want to wish all of my friends, supporters, enemies, hate rs, and even the very dishonest Fake News Media, a Happy and Healthy New Year. 2018 will be a great year for America! Donald J. Trump (@realDonaldTrump) Decem ber 31, 2017Trump's tweet went down about as well as you d expect.what kind of president sends a New Year s greeting like this despicable, petty, infantile gibberish? Swan Trump! His lack of decency won't even allow him to rise above the gutter long enough to wish the American citizens a happy new year! Bishop T albert Swan (@talbertswan) December 31, 2017no one likes you calvin (@calvinstowell) December 31, 2017your impeachment would make 2018 a great year for Ameri ca, but I ll also accept regaining control of Congress. Miranda Yaver (@mirandayaver) December 31, 2017Do you hear yourself talk? When you have to include th at many people that hate you have you have to wonder? Why do they all hate me? Alan Sandoval (@AlanSandoval13) December 31, 2017Who uses the word Haters in a New Years wish?? Marlene (@marlene399) December 31, 2017You can t just say happy new year? Koren politt (@Korencarpenter) December 31, 2017Here s Trump s N ew Year s Eve tweet from 2016.Happy New Year to all, including to my many enemies and those who have fought me and lost so badly they just don t know what to do. Love! Donald J. Trump (@realDonaldTrump) December 31, 2016This is nothing new for Trump. He s been doing this for years.Trump has directed messages to hi s enemies and haters for New Year s, Easter, Thanksgiving, and the anniversary of 9/11. pic.twitter.com/4FPaE2KypA Daniel Dale (@ddale8) December 31, 201 7Trump s holiday tweets are clearly not presidential.How long did he work at Hallmark before becoming President? Steven Goodine. (@SGoodine) December 31, 2017 He s always been like this. . . the only difference is that in the last few years, his filter has been breaking down. Roy Schulze (@thbhttt) December 31, 2 017So, to all the people who voted for this a hole thinking he would change once he got into power, you were wrong! 70-year-old men don t change and now he s a year older.Photo by Andrew Burton/Getty Images.

LR Prediction:Fake News  
DT Prediction:Fake News  
RF Prediction:Fake News  
RF Prediction:Fake News

In [ ]: