```
In [1]:  import pandas as pd
         import numpy as np
         from sklearn.model_selection import train_test_split
         from sklearn.metrics import classification_report
         import re
         import string
```

```
In [2]:  df_fake = pd.read_csv('Fake.csv')
         df_true = pd.read_csv('True.csv')
```

```
In [3]:  df_fake.head(10)
```

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
5	Racist Alabama Cops Brutalize Black Boy While...	The number of cases of cops brutalizing and ki...	News	December 25, 2017
6	Fresh Off The Golf Course, Trump Lashes Out A...	Donald Trump spent a good portion of his day a...	News	December 23, 2017
7	Trump Said Some INSANELY Racist Stuff Inside ...	In the wake of yet another court decision that...	News	December 23, 2017
8	Former CIA Director Slams Trump Over UN Bully...	Many people have raised the alarm regarding th...	News	December 22, 2017
9	WATCH: Brand-New Pro-Trump Ad Features So Muc...	Just when you might have thought we d get a br...	News	December 21, 2017

```
In [4]:  df_true.head(10)
```

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

	title	text	subject	date
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
5	White House, Congress prepare for talks on spe...	WEST PALM BEACH, Fla./WASHINGTON (Reuters) - T...	politicsNews	December 29, 2017
6	Trump says Russia probe will be fair, but time...	WEST PALM BEACH, Fla (Reuters) - President Don...	politicsNews	December 29, 2017
7	Factbox: Trump on Twitter (Dec 29) - Approval ...	The following statements were posted to the ve...	politicsNews	December 29, 2017
8	Trump on Twitter (Dec 28) - Global Warming	The following statements were posted to the ve...	politicsNews	December 29, 2017
9	Alabama official to certify Senator-elect Jone...	WASHINGTON (Reuters) - Alabama Secretary of St...	politicsNews	December 28, 2017

In [5]:
```python
df_fake['class']= 0
df_true['class']= 1
```

In [6]:
```python
df_fake.shape, df_true.shape
```

Out[6]: ((23481, 5), (21417, 5))

In [7]:
```python
df_fake_manual_testing = df_fake.tail(10)
for i in range(23480,23470, -1):
    df_fake.drop([i], axis=0, inplace=True)
df_true_manual_testing = df_true.tail(10)
for i in range(21416,21406, -1):
    df_true.drop([i], axis=0, inplace=True)
```

In [8]:
```python
#Combing both the data and saving as manual_testing file.
df_manual_testing = pd.concat([df_fake_manual_testing, df_true_manual_testing], axis= 0)
df_manual_testing.to_csv("manual_testing.csv")
```

In [9]:
```python
df_merge = pd.concat([df_fake, df_true], axis=0)
df_merge.head(10)
```

Out[9]:
	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

	title	text	subject	date	class
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
5	Racist Alabama Cops Brutalize Black Boy While...	The number of cases of cops brutalizing and ki...	News	December 25, 2017	0
6	Fresh Off The Golf Course, Trump Lashes Out A...	Donald Trump spent a good portion of his day a...	News	December 23, 2017	0
7	Trump Said Some INSANELY Racist Stuff Inside ...	In the wake of yet another court decision that...	News	December 23, 2017	0
8	Former CIA Director Slams Trump Over UN Bully...	Many people have raised the alarm regarding th...	News	December 22, 2017	0
9	WATCH: Brand-New Pro-Trump Ad Features So Muc...	Just when you might have thought we d get a br...	News	December 21, 2017	0

In [10]:
```python
#Removing Title subject and date as it of no use
df = df_merge.drop(['title','subject','date'],axis=1)
df.head(10)
```

Out[10]:

	text	class
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
5	The number of cases of cops brutalizing and ki...	0
6	Donald Trump spent a good portion of his day a...	0
7	In the wake of yet another court decision that...	0
8	Many people have raised the alarm regarding th...	0
9	Just when you might have thought we d get a br...	0

In [11]:
```python
#Lets shuffle the dataset
df = df.sample(frac=1)
```

```
In [12]:  df.head(10)
```

Out[12]:

	text	class
22665	Patrick Henningsen 21st Century WireCliven Bun...	0
20592	WASHINGTON (Reuters) - The U.S. Navy said on F...	1
19187	RIMINI, Italy (Reuters) - The new leader of It...	1
19967	LUSAKA (Reuters) - Zambian President Edgar Lun...	1
7572	This just goes to show, never judge a book by ...	0
5219	WASHINGTON (Reuters) - U.S. President Donald T...	1
16588	Mind blowing incompetence and reckless disrega...	0
2742	Donald Trump just got caught lying on Twitter ...	0
18488	KUALA LUMPUR (Reuters) - Two women accused of ...	1
16187	https://www.youtube.com/watch?v=Ws5ojb0PCCo	0

```
In [13]:  #Checking for the null values
          df.isnull().sum()
```

```
Out[13]:  text     0
          class    0
          dtype: int64
```

```
In [14]:  #Removing all the special characters (like, . '' etc)
          def word_drop(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 [15]:  df['text'] = df['text'].apply(word_drop)
```

```
In [16]:  df.head(10)
```

Out[16]:

	text	class
22665	patrick henningsen century wirecliven bundy ...	0
20592	washington reuters the u s navy said on f...	1
19187	rimini italy reuters the new leader of it...	1
19967	lusaka reuters zambian president edgar lun...	1
7572	this just goes to show never judge a book by ...	0
5219	washington reuters u s president donald t...	1
16588	mind blowing incompetence and reckless disrega...	0
2742	donald trump just got caught lying on twitter ...	0
18488	kuala lumpur reuters two women accused of ...	1
16187	https www youtube com watch v	0

```
In [17]:  #Defing the dependent and independent variables
          x = df['text']
          y = df['class']
```

```
In [18]:  x_train, x_test, y_train, y_test = train_test_split(x,y, test_size = .25)
```

```
In [19]:  from sklearn.feature_extraction.text import TfidfVectorizer
```

```
In [20]:  vectrorization = TfidfVectorizer()
          xv_train = vectrorization.fit_transform(x_train)
          xv_test = vectrorization.transform(x_test)
```

Logistic Regression

```
In [21]:  from sklearn.linear_model import LogisticRegression
```

```
In [22]:   LR = LogisticRegression()
           LR.fit(xv_train, y_train)

Out[22]:   LogisticRegression()

In [23]:   LR.score(xv_test, y_test)

Out[23]:   0.9868983957219252

In [24]:   pred_LR = LR.predict(xv_test)

In [25]:   print(classification_report(y_test, pred_LR))
```

```
               precision    recall  f1-score   support

           0       0.99      0.99      0.99      5833
           1       0.98      0.99      0.99      5387

    accuracy                           0.99     11220
   macro avg       0.99      0.99      0.99     11220
weighted avg       0.99      0.99      0.99     11220
```

Decission Tree Classification

```
In [26]:   from sklearn.tree import DecisionTreeClassifier

In [27]:   DT = DecisionTreeClassifier()
           DT.fit(xv_train, y_train)

Out[27]:   DecisionTreeClassifier()

In [28]:   DT.score(xv_test, y_test)

Out[28]:   0.9963458110516934

In [29]:   pred_DT = DT.predict(xv_test)
```

```
In [30]:  print(classification_report(y_test, pred_DT))
```

```
              precision    recall  f1-score   support

           0       1.00      1.00      1.00      5833
           1       1.00      1.00      1.00      5387

    accuracy                           1.00     11220
   macro avg       1.00      1.00      1.00     11220
weighted avg       1.00      1.00      1.00     11220
```

Gradient Boosting classifier

```
In [31]:  from sklearn.ensemble import GradientBoostingClassifier
```

```
In [32]:  GBC = GradientBoostingClassifier(random_state = 0)
          GBC.fit(xv_train, y_train)
```

```
Out[32]:  GradientBoostingClassifier(random_state=0)
```

```
In [33]:  GBC.score(xv_test, y_test)
```

```
Out[33]:  0.9951871657754011
```

```
In [34]:  pred_GBC = GBC.predict(xv_test)
```

```
In [35]:  print(classification_report(y_test, pred_GBC))
```

```
              precision    recall  f1-score   support

           0       1.00      0.99      1.00      5833
           1       0.99      1.00      1.00      5387

    accuracy                           1.00     11220
   macro avg       1.00      1.00      1.00     11220
weighted avg       1.00      1.00      1.00     11220
```

Random Forest Classifier

```
In [36]:    from sklearn.ensemble import RandomForestClassifier
```

```
In [37]:    RFC = RandomForestClassifier(random_state=0)
            RFC.fit(xv_train, y_train)
```

```
Out[37]:    RandomForestClassifier(random_state=0)
```

```
In [38]:    RFC.score(xv_test, y_test)
```

```
Out[38]:    0.9901960784313726
```

```
In [39]:    pred_RFC = RFC.predict(xv_test)
```

```
In [40]:    print(classification_report(y_test, pred_RFC))

                          precision    recall  f1-score   support

                       0       0.99      0.99      0.99      5833
                       1       0.99      0.99      0.99      5387

                accuracy                           0.99     11220
               macro avg       0.99      0.99      0.99     11220
            weighted avg       0.99      0.99      0.99     11220
```

Manual Testing

```
In [44]:    def output_label(n):
                if n == 0:
                    return 'Fake News'
                elif n == 1:
                    return "News is not Fake"

            def manual_testing(news):
                testing_news = {"text":[news]}
                new_def_test = pd.DataFrame(testing_news)
```

```
        new_def_test['text'] = new_def_test['text'].apply(word_drop)
        new_x_test = new_def_test['text']
        new_xv_test = vectrorization.transform(new_x_test)
        pred_LR = LR.predict(new_xv_test)
        pred_DT = DT.predict(new_xv_test)
        pred_GBC = GBC.predict(new_xv_test)
        pred_RFC = RFC.predict(new_xv_test)

        return print("\n\nLR Prediction: {} \nDT Prediction: {} \nGBC Prediction: {} \nRFC Prediction: {}".format(output_
                                                                                                             output_
                                                                                                             output_
                                                                                                             output_
```

In [45]:
```
news = str(input())
manual_testing(news)
```

21st Century Wire says This week, the historic international Iranian Nuclear Deal was punctuated by a two-way prisone
r swap between Washington and Tehran, but it didn t end quite the way everyone expected. On the Iranian side, one of
the U.S. citizens who was detained in Iran, Nosratollah Khosravi-Roodsari, has stayed in Iran, but on the U.S. side
all 7 of the Iranians held in U.S. prisons DID NOT show up to their flight to Geneva for the prisoner exchange   with
at least 3 electing to stay in the U.S TEHRAN SIDE: In Iran, 5 U.S. prisoners were released, with 4 of them making t
heir way to Germany via Switzerland.Will Robinson Daily MailNone of the Iranians freed in the prisoner swap have retu
rned home and could still be in the United States, it has been reported.The seven former inmates, who were released a
s part of a deal with the Islamic republic, did not show up to get a flight to Geneva, Switzerland, where the exchang
e was set to take place on Sunday.Three of the Iranians have decided to stay in the United States, ABC reported, with
some moving in with their families. However it is not known where the other four are.Three of the Americans who had b
een detained in Iran   Washington Post journalist Jason Rezaian, former U.S. Marine Amir Hekmati and Christian pastor
Saeed Abedini   left Tehran at around 7am the same day, but weren t met by their counterparts in Switzerland Continue
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LR Prediction: Fake News
DT Prediction: Fake News
GBC Prediction: Fake News
RFC Prediction: Fake News

In [ ]: