

Fake news Detection



Importing required library

Here I am going to importing some of the required library, if extra library is required to install it will be install later on.

```
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
```

Inserting fake and real dataset

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

```
In [3]: df_fake.head(5)
```

	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 Na...	News	December 31, 2017
2	Sherril Dwyer 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]: df_true.head(5)
```

	title	text	subject	date
0	As U.S. budget fight looms, Republicans flip ...	WASHINGTON (Reuters) - The head of a conservat...	politicsNews	December 31, 2017
1	U.S. military to accept transgender recruits a...	WASHINGTON (Reuters) - Transgender people wi...	politicsNews	December 29, 2017
2	Senior U.S. Republican senator: Let Mr. Mueller...	WASHINGTON (Reuters) - The special counsel inv...	politicsNews	December 31, 2017
3	FBI Russia probe helped by Australian diplomati...	WASHINGTON (Reuters) - Trump campaign adviser ...	politicsNews	December 30, 2017
4	Trump warns Postal Service to change 'much muc...	SEATTLEWASHINGTON (Reuters) - President Donal...	politicsNews	December 29, 2017

Inserting a column called "class" for fake and real news dataset to categories fake and true news.

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

Removing last 10 rows from both the dataset, for manual testing

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

```
Out[6]: ((23481, 5), (21477, 5))
```

```
In [7]: df_fake_manual_testing = df_fake.tail(10)
for i in range(23480, 23476, -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]: df_fake.shape, df_true.shape
```

```
Out[8]: ((23471, 5), (21467, 5))
```

Merging the manual testing dataframe in single dataset and save it in a csv file

```
In [9]: df_fake_manual_testing["class"] = 0
df_true_manual_testing["class"] = 1

<ipython-input-9-3aa8f8ec2aad1>: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
<ipython-input-9-3aa8f8ec2aad1>: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
df_true_manual_testing["class"] = 1
```

```
In [10]: df_fake_manual_testing.head(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 Dady Chery and Gilbert MercierAll writers ...	Middle-east	January 19, 2016	0
23473	Astounding: 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 Fattina CounterpunchAlthough the United...	Middle-east	January 18, 2016	0
23476	McPain: John McCain Furious That Iran Treated ...	21st Century Wire says As 21WIRE reported earl...	Middle-east	January 16, 2016	0
23477	JUSTICE? Yahoo Settles E-mail Privacy Class-ac...	21st Century Wire says It's a familiar theme. ...	Middle-east	January 16, 2016	0
23478	Sunstein: US and Allied 'Safe Zone' Plan to T...	Patrick Henningsen 21st Century WireRemember ...	Middle-east	January 15, 2016	0
23479	How to Blow \$700 Million: Al Jazeera America F...	21st Century Wire says Al Jazeera America will...	Middle-east	January 14, 2016	0
23480	10 U.S. Navy Sailors Held by Iranian Military ...	21st Century Wire says As 21WIRE predicted in ...	Middle-east	January 12, 2016	0

```
In [11]: df_true_manual_testing.head(10)
```

	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 joun...	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
21412	'Fully committed' NATO backs new U.S. approach...	BRUSSELS (Reuters) - NATO allies on Tuesday we...	worldnews	August 22, 2017	1
21413	LexisNexis withdrew two products from Chinese ...	LONDON (Reuters) - LexisNexis, a provider of l...	worldnews	August 22, 2017	1
21414	Minsk cultural hub becomes haven from authoriti...	MINSK (Reuters) - In the shadow of disused Sov...	worldnews	August 22, 2017	1
21415	Vatican upbeat on possibility of Pope Francis ...	MOSCOW (Reuters) - Vatican Secretary of State ...	worldnews	August 22, 2017	1
21416	Indonesia to buy \$1.14 billion worth of Russia...	JAKARTA (Reuters) - Indonesia will buy 11 Sukh...	worldnews	August 22, 2017	1

```
In [12]: df_manual_testing = pd.concat([df_fake_manual_testing, df_true_manual_testing], axis = 0)
df_manual_testing.to_csv("manual_testing.csv")
```

Merging the main fake and true dataframe

```
In [13]: df_marge = pd.concat([df_fake, df_true], axis =0 )
df_marge.head(10)
```

	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 Na...	News	December 31, 2017	0
2	Sherril Dwyer 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 kil...	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 22, 2017	0
8	Former CIA Director Suggests 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 [14]: df_marge.columns
```

```
Out[14]: Index(['title', 'text', 'subject', 'date', 'class'], dtype='object')
```

"title", "subject" and "date" columns is not required for detecting the fake news, so I am going to drop the columns.

```
In [15]: df = df_marge.drop(["title", "subject", "date"], axis = 1)
```

```
In [16]: df.isnull().sum()
```

```
Out[16]: text      0
class      0
dtype: int64
```

Randomly shuffling the dataframe

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

```
In [18]: df.head()
```

	text	class
13731	Wow! This lady who is a DNC Platform Committe...	0
12889	Smug liberal newspapers and tv networks have p...	0
17074	The answer is anyone but YOU. Did you know tha...	0
5048	(Reuters) - A government watchdog group, Publi...	1
16096	Tucker takes on the co-director of Popular Res...	0

```
In [19]: df.reset_index(inplace = True)
df.drop(["index"], axis = 1, inplace = True)
```

```
In [20]: df.columns
```

```
Out[20]: Index(['text', 'class'], dtype='object')
```

```
In [21]: df.head()
```

	text	class
0	Wow! This lady who is a DNC Platform Committe...	0
1	Smug liberal newspapers and tv networks have p...	0
2	The answer is anyone but YOU. Did you know tha...	0
3	(Reuters) - A government watchdog group, Publi...	1
4	Tucker takes on the co-director of Popular Res...	0

Creating a function to convert the text in lowercase, remove the extra space, special chr., ulr and links.

```
In [22]: def wordopt(text):
text = re.sub('[\.\?\,]', '', text)
text = re.sub('[\W]+', " ", text)
text = re.sub('http://[^\s]+[^\s]+', '', text)
text = re.sub('(<.+>+)', '', text)
text = re.sub('[\s]', '%20', string.punctuation), '', text)
text = re.sub('[\n]', '\n', text)
return text
```

```
In [23]: df["text"] = df["text"].apply(wordopt)
```

Defining dependent and independent variable as x and y

```
In [24]: x = df["text"]
y = df["class"]
```

Splitting the dataset into training set and testing set.

```
In [25]: x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.25)
```

Convert text to vectors

```
In [26]: from sklearn.feature_extraction.text import TfidfVectorizer
```

```
In [27]: vectorization = TfidfVectorizer()
xv_train = vectorization.fit_transform(x_train)
xv_test = vectorization.transform(x_test)
```

1. Logistic Regression

```
In [28]: from sklearn.linear_model import LogisticRegression
```

```
In [29]: LR = LogisticRegression()
LR.fit(xv_train, y_train)
```

```
Out[29]: LogisticRegression()
```

```
In [30]: pred_lr_LR = LR.predict(xv_test)
```

```
In [31]: LR.score(xv_test, y_test)
```

```
Out[31]: 0.9885626737967915
```

```
In [32]: print(classification_report(y_test, pred_lr))
```

	precision	recall	f1-score	support
0	0.99	0.99	0.99	5883
1	0.99	0.99	0.99	5337
accuracy			0.99	11220
macro avg	0.99	0.99	0.99	11220
weighted avg	0.99	0.99	0.99	11220

2. Decision Tree Classification

```
In [33]: from sklearn.tree import DecisionTreeClassifier
```

```
In [34]: DT = DecisionTreeClassifier()
DT.fit(xv_train, y_train)
```

```
Out[34]: DecisionTreeClassifier()
```

```
In [35]: pred_dt = DT.predict(xv_test)
```

```
In [36]: DT.score(xv_test, y_test)
```

```
Out[36]: 0.9945632798573975
```

```
In [37]: print(classification_report(y_test, pred_dt))
```

	precision	recall	f1-score	support
0	1.00	0.99	1.00	5883
1	0.99	1.00	0.99	5337
accuracy			1.00	11220
macro avg	0.99	1.00	1.00	11220
weighted avg	1.00	1.00	1.00	11220

3. Gradient Boosting Classifier

```
In [38]: from sklearn.ensemble import GradientBoostingClassifier
```

```
In [39]: GBC = GradientBoostingClassifier(random_state=0)
GBC.fit(xv_train, y_train)
```

```
Out[39]: GradientBoostingClassifier(random_state=0)
```

```
In [40]: pred_gbc = GBC.predict(xv_test)
```

```
In [41]: GBC.score(xv_test, y_test)
```

```
Out[41]: 0.9955436720142602
```

```
In [42]: print(classification_report(y_test, pred_gbc))
```

	precision	recall	f1-score	support
0	1.00	0.99	1.00	5883
1	0.99	1.00	1.00	5337
accuracy			1.00	11220
macro avg	0.99	1.00	1.00	11220
weighted avg	1.00	1.00	1.00	11220

4. Random Forest Classifier

```
In [43]: from sklearn.ensemble import RandomForestClassifier
```

```
In [44]: RFC = RandomForestClassifier(random_state=0)
RFC.fit(xv_train, y_train)
```

```
Out[44]: RandomForestClassifier(random_state=0)
```

```
In [45]: pred_rfc = RFC.predict(xv_test)
```

```
In [46]: RFC.score(xv_test, y_test)
```

```
Out[46]: 0.9915329768270945
```

```
In [47]: print(classification_report(y_test, pred_rfc))
```

	precision	recall	f1-score	support
0	0.99	0.99	0.99	5883
1	0.99	0.99	0.99	5337
accuracy			0.99	11220
macro avg	0.99	0.99	0.99	11220
weighted avg	0.99	0.99	0.99	11220

Model Testing With Manual Entry

News

```
In [48]: 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"]
    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_label(pred_LR[0]),
                                                                                                         output_label(pred_DT[0]),
                                                                                                         output_label(pred_GBC[0]),
                                                                                                         output_label(pred_RFC[0])))
```

```
In [49]: news = str(input())
manual_testing(news)
```

Paul Craig RobertsIn 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 ad vance 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 destr oyed 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 p urity 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 La issez 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-t erm profit interests of management, shareholders, and Wall Street eviscerated the American economy, sending manufacturing jobs, business know-how, and technology, along with profes sional 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 58% 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 co vered up by the prestittute media, 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 astonish ed. 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 g overment 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 b y 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 th e 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 fr om 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 in fflation 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 beca use 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 be cause 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 prestittute 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 i ts 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 A merica 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 A merica 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 ambulator y 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 Neol, a revolu tion 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 g overnment, controlled as it is by corrupt economic interests, would never permit policies that impinged on executive bonuses and Wall Street profits. Today US capitalis 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 t he 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 prestittutes pa id 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 appoint ments. 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 Neconservative Threat to World Order. READ MORE NWO NEWS AT: 21st Century Wire NWO Files

```
LR Prediction: Fake News
DT Prediction: Fake News
GBC Prediction: Fake News
RFC Prediction: Fake News
```