NAAN MUDHALVAN PROJECT(IBM)

IBM AI 101 ARTIFICIAL INTELLIGENCE-GROUP 1

Team name: Proj_224823_Team_1

Team members: SAI VIGNESH S (reg no 113321106079)

THIRUMARAN S (reg no 113321106106)

VIGNESH V (reg no 113321106115)

LINGESH V(reg no 113321106301)

SRINIVASA BHARATH S(reg 113321106094)

Problem Statement :

Design and develop an NLP-based system that can accurately identify and classify news articles or information as either "fake" or "real" by analyzing the textual content, with the primary goal of mitigating the spread of misinformation and promoting the dissemination of trustworthy information.

DATASET

- This data set consists of 40000 fake and real news.
- Our goal is to train our model to accurately predict whether a particular piece of news is real or fake.
- Fake and real news data are given in two separate data sets, with each data set consisting of approximately 20000 articles.

LOADING THE DATA SET

LOAD REQUIRED LIBRARIES:(program)

```
import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
import matplotlib.pyplot as plt
import seaborn as sns

from bs4 import BeautifulSoup
import re
import string
import nltk
from nltk.corpus import stopwords
from nltk.stem import WordNetLemmatizer
from wordcloud import WordCloud, STOPWORDS
from nltk.tokenize import word_tokenize
```

LOADING THE DATA SET

LOAD REQUIRED LIBRARIES:(program)

```
from sklearn.model_selection import train_test_split
from sklearn.pipeline import Pipeline
from sklearn.linear_model import LogisticRegression
from sklearn.neighbors import KNeighborsClassifier
from sklearn.tree import DecisionTreeClassifier
from sklearn.ensemble import RandomForestClassifier,GradientBoostingClassifier
from sklearn.metrics import accuracy_score, confusion_matrix, classification_report
from sklearn.feature_extraction.text import TfidfVectorizer
```

LOADING THE DATA SET

IMPORT THE DATASET:

Input 1:

```
#import dataset
fake = pd.read_csv("../input/fake-and-real-news-dataset/Fake.csv")
true = pd.read_csv("../input/fake-and-real-news-dataset/True.csv")

#data exploration
fake.head()
```

Output 1:

	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

LOADING THE DATA SET

DISPLAY THE DATASET :

```
true.head()
```

Output 2: :

	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

LOADING THE DATA SET

READ & DISPLAY THE DATASET:

```
#add column
true_data['target'] = 1
fake_data['target'] = 0
 true_data.tail()
```

OUTPUT:

	title	text	subject	date	target
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 authorities	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

DATA PREPROCESSING:

MISSING VALUES:

- Data cleaning is a very crucial step in any machine learning model, but more so for NLP.
- Without the cleaning process, the dataset is often a cluster of words that the computer doesn't understand.
- Here, It will go over steps done in a typical machine learning text pipeline to clean data.

PROGRAM:

```
#data cleaning
#combining the title and text columns
df['text'] = df['title'] + " " + df['text']
#deleting few columns from the data
del df['title']
del df['subject']
del df['date']
df.head()
```

DATA PREPROCESSING:

DATA CLEANING:

OUTPUT:

	text	target
0	politicsNews As U.S. budget fight looms, Repub...	1
1	politicsNews U.S. military to accept transgend...	1
2	politicsNews Senior U.S. Republican senator: '...	1
3	politicsNews FBI Russia probe helped by Austra...	1
4	politicsNews Trump wants Postal Service to cha...	1

DATA PREPROCESSING:

REMOVE STOPWORDS:

```
nltk.download("stopwords")
from nltk.corpus import stopwords

# we can use tokenizer instead of split
first_text = nltk.word_tokenize(first_text)
first_text = [ word for word in first_text if not word in set(stopwords.words("english"))]
```

LEMMATIZATION:

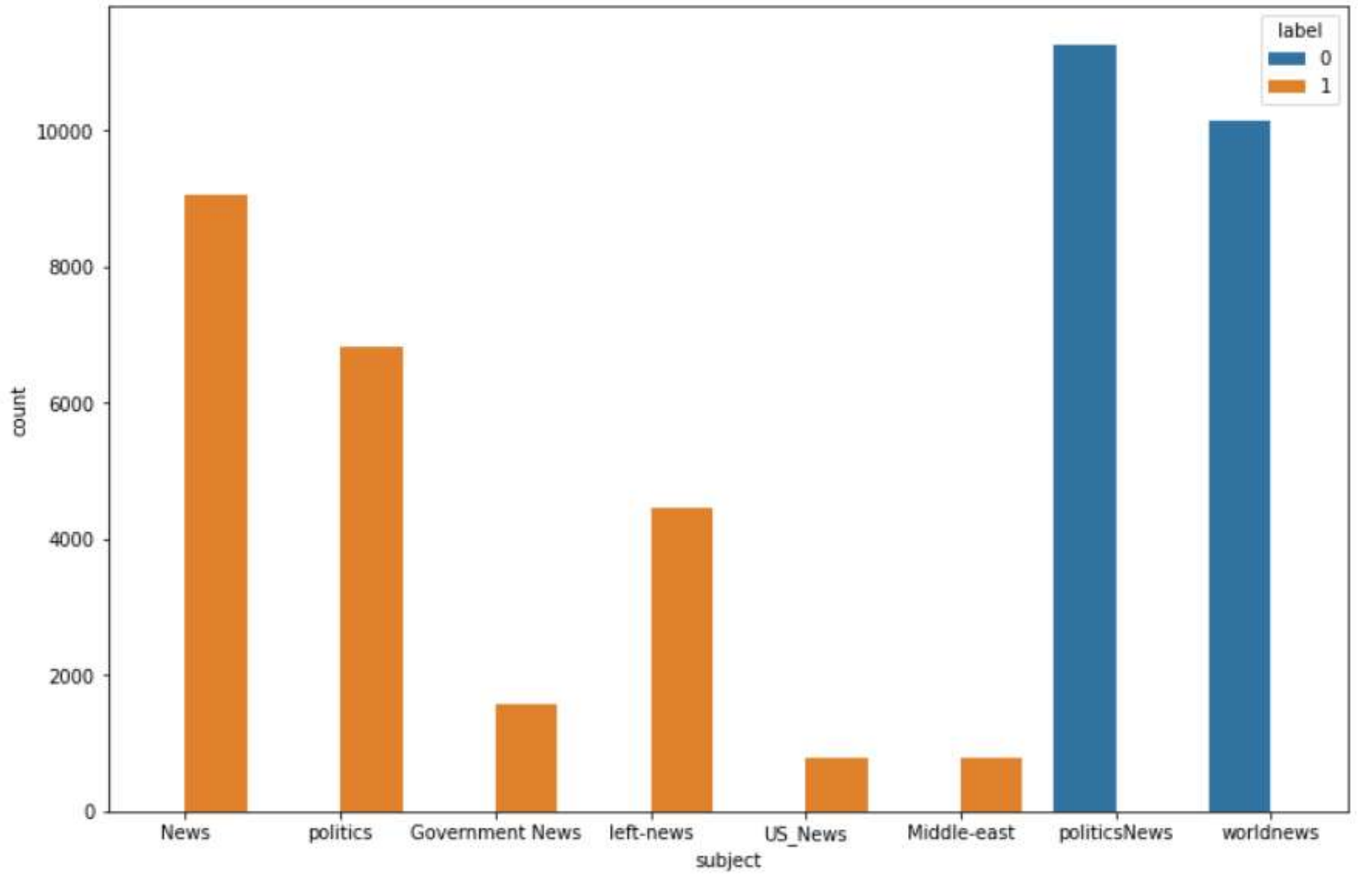
```
lemma = nltk.WordNetLemmatizer()
first_text = [ lemma.lemmatize(word) for word in first_text]

first_text = " ".join(first_text)
first_text
```

EXPLORATORY ANAYLSIS

1: CODING:

```
plt.figure(figsize=(12,8))
sns.countplot(x = "subject", data=df, hue = "label")
plt.show()
```

OUTPUT:

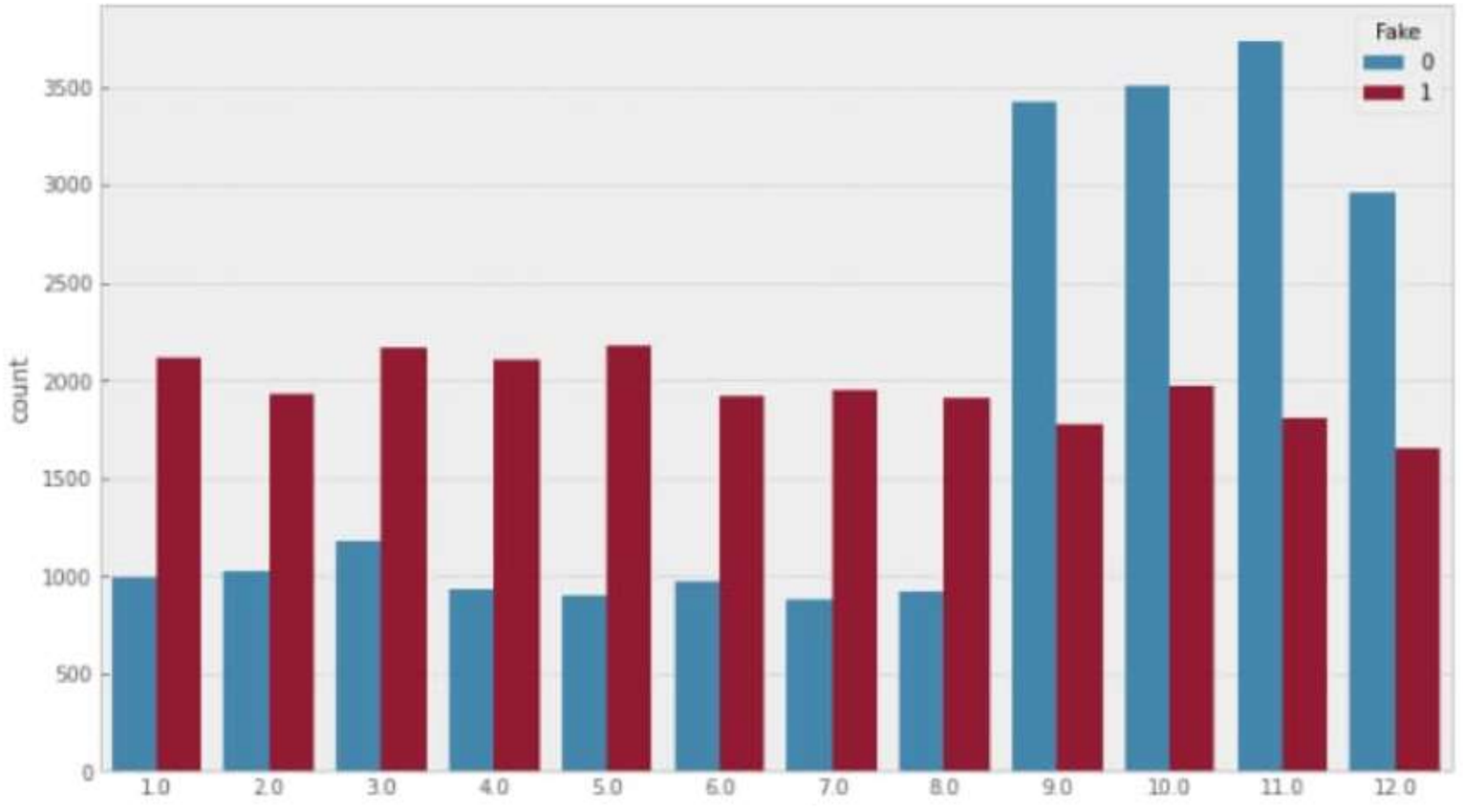


EXPLORATORY ANAYLSIS 2:

CODING:

```
# Correlation between months and news
plt.style.use('bmh')
plt.figure(figsize=(12, 7))
sns.countplot(data=df, x='Month', hue='Fake')
```

OUTPUT:



N GRAM ANAYLSIS :

Unigram Analysis (1-gram):

- In unigram analysis, each word is considered independently without any regard to its neighboring words.

This is the simplest form of n gram analysis.

Bigram Analysis (2-gram):

- Bigram analysis considers pairs of consecutive words.

This type of analysis capture some level of context.

Trigram Analysis (3-gram):

- Trigram analysis looks at sequences of three consecutive words.

This provides a bit more context compared to bigrams.

ALGORITHM:

- HERE , WE ARE USING LSTM ALGORITHM FOR TRAINING MODEL
- IT IS ONE OF THE BEST ALGORITHM IN NLP TECHNIQUE

THANK YOU