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**TEAM:05**

```
import pandas as pd
import numpy as nm
from sklearn.model_selection import train_test_split as ttp
from sklearn.metrics import classification_report
import re
import string
import matplotlib.pyplot as plt
```

```
data_true=pd.read_csv("/content/drive/MyDrive/True.csv")
data_fake=pd.read_csv("/content/drive/MyDrive/Fake.csv")
```

```
data_true.head()
```

| | 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_true.shape, data_fake.shape
```

```
((21417, 4), (23481, 4))
```

```
data_true["class"]=1
data_fake["class"]=0
```

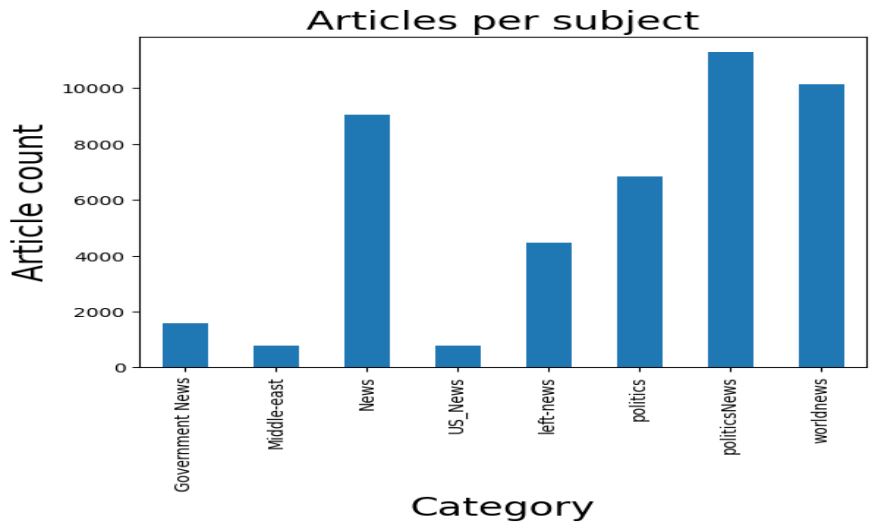
```
data_true_manual_testing = data_true.tail(10)
for i in range(21417,23481,-1):
  data_true.drop([i],axis=0, inplace=True)

data_fake_manual_testing = data_fake.tail(10)
for i in range(21417,23481,-1):
  data_fake.drop([i],axis=0,inplace=True)

data_manual_testing =
pd.concat([data_fake_manual_testing,data_true_manual_testing])
data_manual_testing.to_csv("manual_testing.csv")
```

```
data_merge = pd.concat([data_fake,data_true])
data_merge.head()
```

| | 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 |

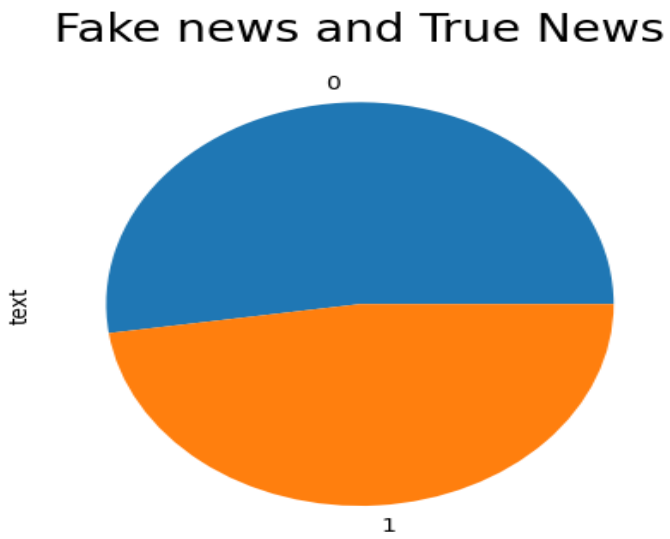
```
print(data_merge.groupby(['subject'])['text'].count())
data_merge.groupby(['subject'])['text'].count().plot(kind="bar")
plt.title("Articles per subject",size=20)
plt.xlabel("Category",size=20)
plt.ylabel("Article count", size=20)
plt.show()
```

```
subject
Government News     1570
Middle-east          778
News                9050
US_News              783
left-news           4459
politics            6841
politicsNews       11272
worldnews          10145
Name: text, dtype: int64
```



```
print(data_merge.groupby(['class'])['text'].count())
print("0= Fake news\n1= True news")
data_merge.groupby(['class'])['text'].count().plot(kind="pie")
plt.title("Fake news and True News", size=20)
plt.show()
```

```
class
0    23481
1    21417
Name: text, dtype: int64
0= Fake news
1= True news
```




```
data = data_merge.drop(["title","subject","date"],axis=1)
data.head(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 |

| | text | class |
|---|---|---|
| 9 | Just when you might have thought we d get a br... | 0 |

```
data=data.sample(frac=1)
data.head(10)
```

| | text | class |
|---|---|---|
| 5972 | The media hyped the fact that Donald Trump use... | 0 |
| 2054 | One of the selling points of Donald Trump s Su... | 0 |
| 1026 | On Saturday, Green Party candidate Jill Stein ... | 0 |
| 15340 | BEIRUT (Reuters) - Syria s army and allies inc... | 1 |
| 3592 | (Reuters) - Vermont’s governor on Wednesday ha... | 1 |
| 17417 | MOMBASA, Kenya (Reuters) - Kenyan opposition l... | 1 |
| 10268 | BUENOS AIRES (Reuters) - Celeste Perosino was ... | 1 |
| 15619 | BRUSSELS (Reuters) - A Belgian judge has grant... | 1 |
| 23091 | Join Patrick every Wednesday at Independent T... | 0 |
| 7571 | Over the past few months, McDonalds has been a... | 0 |

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

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

```
def filtering(data):
    text=data.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('\w*\d\w*','',text)
    return text
```

```
data['text']=data['text'].apply(filtering)
data.head(10)
```

| | text | class |
|---|---|---|
| 5972 | the media hyped the fact that donald trump use... | 0 |
| 2054 | one of the selling points of donald trump s su... | 0 |
| 1026 | on saturday green party candidate jill stein ... | 0 |

| | text | class |
|---|---|---|
| 15340 | beirut reuters syria s army and allies inc... | 1 |
| 3592 | reuters vermont s governor on wednesday ha... | 1 |
| 17417 | mombasa kenya reuters kenyan opposition l... | 1 |
| 10268 | buenos aires reuters celeste perosino was ... | 1 |
| 15619 | brussels reuters a belgian judge has grant... | 1 |
| 23091 | join patrick every wednesday at independent t... | 0 |
| 7571 | over the past few months mcdonalds has been a... | 0 |

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

```
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import classification_report
from sklearn.model_selection import train_test_split # Import
train_test_split


X_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.2,
random_state=42) # Split the data


vectorization = TfidfVectorizer()
xv_train = vectorization.fit_transform(X_train)
xv_test = vectorization.transform(x_test)

LR = LogisticRegression()
LR.fit(xv_train, y_train)


pred_lr = LR.predict(xv_test)

print(classification_report(y_test, pred_lr))

new_text = ["modi is not pm of india"]
new_text_vectorized = vectorization.transform(new_text)
prediction = LR.predict(new_text_vectorized)

if prediction[0] == 0:
    print("Fake News.")
else:
    print("True News.")
```

```
              precision    recall  f1-score   support

           0       0.99      0.99      0.99      4713
           1       0.98      0.99      0.99      4267

    accuracy                           0.99      8980
   macro avg       0.99      0.99      0.99      8980
weighted avg       0.99      0.99      0.99      8980
```

**Fake News.**

```
from sklearn.tree import DecisionTreeClassifier


dt_classifier = DecisionTreeClassifier()

print("Shape of xv_train:", xv_train.shape)
print("Shape of y_train:", y_train.shape)


X_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.2,
random_state=42)

xv_train = vectorization.fit_transform(X_train)

dt_classifier.fit(xv_train, y_train)
```

```
Shape of xv_train: (35918, 97276)
Shape of y_train: (35918,)
```

```
DecisionTreeClassifier()
```

```
dt_classifier.score(xv_test,y_test).round(2)
if prediction[0] == 0:
    print("Fake News.")
else:
    print("True News.")
```

**Fake News.**

```
from sklearn.ensemble import RandomForestClassifier
from sklearn.model_selection import train_test_split
from sklearn.feature_extraction.text import TfidfVectorizer


x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.25,
random_state=0)

rf = RandomForestClassifier()
```

```
vectorizer = TfidfVectorizer()
x_train_vec = vectorizer.fit_transform(x_train)
x_test_vec = vectorizer.transform(x_test)

rf.fit(x_train_vec, y_train)

predictions = rf.predict(x_test_vec)

print(classification_report(y_test, predictions))

if prediction[0] == 0:
    print("Fake News.")
else:
    print("True News.")
```

```
              precision    recall f1-score   support

           0       0.99      0.99      0.99      5808
           1       0.99      0.99      0.99      5417

    accuracy                           0.99     11225
   macro avg       0.99      0.99      0.99     11225
weighted avg       0.99      0.99      0.99     11225
```

**Fake News.**

```
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.linear_model import LogisticRegression
from sklearn.tree import DecisionTreeClassifier
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import classification_report
from sklearn.model_selection import train_test_split

X_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.2,
random_state=42)


vectorization = TfidfVectorizer()
xv_train = vectorization.fit_transform(X_train)
xv_test = vectorization.transform(x_test)


LR = LogisticRegression()
LR.fit(xv_train, y_train
pred_lr = LR.predict(xv_test)

dt_classifier = DecisionTreeClassifier()
dt_classifier.fit(xv_train, y_train)
```

```
pred_dt = dt_classifier.predict(xv_test)


rf = RandomForestClassifier()
rf.fit(xv_train, y_train)


pred_rf = rf.predict(xv_test)


new_text = ["modi is not pm of india"]
new_text_vectorized = vectorization.transform(new_text)


prediction_lr = LR.predict(new_text_vectorized)

if prediction_lr[0] == 0:
    print("Logistic Regression: Fake News.")
else:
    print("Logistic Regression: True News.")

prediction_dt = dt_classifier.predict(new_text_vectorized)

if prediction_dt[0] == 0:
    print("Decision Tree: Fake News.")
else:
    print("Decision Tree: True News.")

prediction_rf = rf.predict(new_text_vectorized)

if prediction_rf[0] == 0:
    print("Random Forest: Fake News.")
else:
    print("Random Forest: True News.")
```

**Logistic Regression: Fake News.**
**Decision Tree: Fake News.**
**Random Forest: Fake News.**