```
import pandas as pd
import nltk
from nltk.sentiment.vader import SentimentIntensityAnalyzer
from nltk.tokenize import word_tokenize
from nltk.corpus import stopwords
import pandas as pd
import re
from nltk.tokenize import word_tokenize
from nltk.corpus import stopwords
from nltk.stem import WordNetLemmatizer
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.decomposition import LatentDirichletAllocation
from nltk.stem import PorterStemmer
import nltk

nltk.download('punkt')
```

```
[nltk_data] Downloading package punkt to /root/nltk_data...
[nltk_data]   Unzipping tokenizers/punkt.zip.
True
```

```
# Load Zomato dataset
df = pd.read_csv('/content/zomato_reviews.csv')

# Display the first few rows of the dataset
df.head()
```

	Unnamed: 0	rating	review
0	0	5	nice
1	1	5	best biryani , so supportive staff of outlet ,...
2	2	4	delivery boy was very decent and supportive.👌👍
3	3	1	worst biryani i have tasted in my life, half o...
4	4	5	all food is good and tasty . will order again ...

```
print("Number of rows in data:", df.shape[0])
print("Number of columns in data:", df.shape[1])
```

```
Number of rows in data: 5479
Number of columns in data: 3
```

```
df.rating.value_counts()
```

```
rating
5    2288
1    1891
3     474
4     458
2     368
Name: count, dtype: int64
```

```
# Check the null values
df.isnull().sum()
```

```
Unnamed: 0    0
rating        0
review        1
dtype: int64
```

```
df = df.dropna()
```

```
df.isnull().sum()
```

```
Unnamed: 0    0
rating        0
review        0
dtype: int64
```

```
df=df.drop(columns=['Unnamed: 0'])
```

```
df.rating=df.rating.replace([1,2,3],0)
df.rating=df.rating.replace([4,5],1)
```

```
df.head()
```

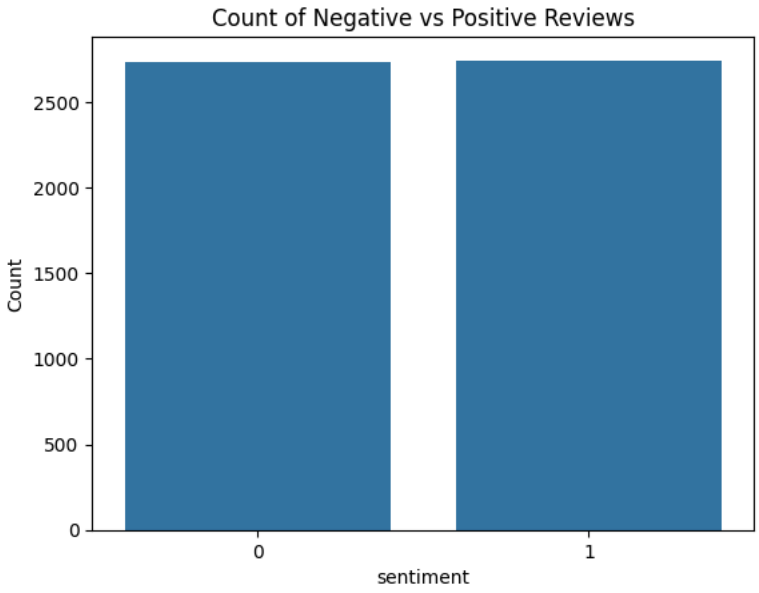
	rating	review
0	1	nice
1	1	best biryani , so supportive staff of outlet ,...
2	1	delivery boy was very decent and supportive.👌👍
3	0	worst biryani i have tasted in my life, half o...
4	1	all food is good and tasty . will order again ...

```
df.rating.value_counts()
```

```
rating
1    2745
0    2733
Name: count, dtype: int64
```

```
import seaborn as sns
import matplotlib.pyplot as plt

# Assuming df is your DataFrame and 'Recommended IND' is the column of interest
sns.barplot(x=df['rating'].value_counts().index, y=df['rating'].value_counts())
plt.xlabel('sentiment')
plt.ylabel('Count')
plt.title('Count of Negative vs Positive Reviews')
plt.show()
```




```
import nltk
nltk.download('stopwords')

ps =PorterStemmer()

def preprocess_text(text):
    review=re.sub("[^a-zA-Z]"," ",text)
    review=review.lower()
    review=review.split()
    review=[ps.stem(word) for word in review if word not in set(stopwords.words("english"))]
    review=" ".join(review)
    return review
```

```
[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
```

```
df['cleaned_review'] = df['review'].apply(preprocess_text)
```

```
df
```

	rating	review	cleaned_review
0	1	nice	nice
1	1	best biryani , so supportive staff of outlet ,...	best biryani support staff outlet person order...
2	1	delivery boy was very decent and supportive.👌👍	deliveri boy decent support
3	0	worst biryani i have tasted in my life, half o...	worst biryani tast life half biryani dustbin
4	1	all food is good and tasty . will order again ...	food good tasti order lot explor bawarchi menu
...	...	...	...
5474	1	complain	complain
5475	1	it took 1 hour to assign valvet and thn prepar...	took hour assign valvet thn prepar food like m...
5476	1	took for an hour to prepare 3 khawsa, which in...	took hour prepar khawsa real life get prepar m...
5477	0	very very late, littrally did time pass and it...	late littral time pass item proper
5478	0	Taste was stale and they give only 5 pieces in...	tast stale give piec rs pleas cheat onlin custom

5478 rows × 3 columns

```
X = df["cleaned_review"]
y = df["rating"]
```

```
X.head()
```

```
0                                          nice
1    best biryani support staff outlet person order...
2                          deliveri boy decent support
3         worst biryani tast life half biryani dustbin
4       food good tasti order lot explor bawarchi menu
Name: cleaned_review, dtype: object
```

```
Start coding or generate with AI.
```

```
from sklearn.feature_extraction.text import TfidfVectorizer
cv=TfidfVectorizer(max_features=5000)
X=cv.fit_transform(X).toarray()
```

```
X.shape
```

```
(5478, 3952)
```

```
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=101)
```

```
X_train.shape ,X_test.shape,Y_train.shape,Y_test.shape
```

```
((4382, 3952), (1096, 3952), (4382,), (1096,))
```

```
from sklearn.naive_bayes import MultinomialNB
from sklearn.metrics import accuracy_score,classification_report,confusion_matrix
mb=MultinomialNB()
mb.fit(X_train,Y_train)
```

```
▾ MultinomialNB
MultinomialNB()
```

```
pred=mb.predict(X_test)
```

```
print(accuracy_score(Y_test,pred))
```

```
0.5264598540145985
```

```
print(confusion_matrix(Y_test,pred))
```

```
[[301 246]
 [273 276]]
```

```
print(classification_report(Y_test,pred))
```

```
                   precision    recall  f1-score   support

               0       0.52      0.55      0.54       547
               1       0.53      0.50      0.52       549

        accuracy                           0.53      1096
       macro avg       0.53      0.53      0.53      1096
    weighted avg       0.53      0.53      0.53      1096
```

```
import numpy as np
pd.DataFrame(np.c_[Y_test,pred],columns=["Actual","Predicted"])
```

	Actual	Predicted
0	0	0
1	1	1
2	0	1
3	0	1
4	0	0
...	...	...
1091	0	0
1092	1	0
1093	1	0
1094	0	0
1095	0	0

1096 rows × 2 columns

```
import pickle
pickle.dump(cv,open('count-Vectorizer.pkl','wb'))
pickle.dump(mb,open("classifiation.pkl","wb"))
```

```
save_cv=pickle.load(open('count-Vectorizer.pkl','rb'))
model=pickle.load(open("classifiation.pkl","rb"))
```

```
def test_model(sentence):
    sen=save_cv.transform([sentence]).toarray()
    res=model.predict(sen)[0]
    if res==1:
        return "Positive Review"
    else:
        return "Negative review"
```

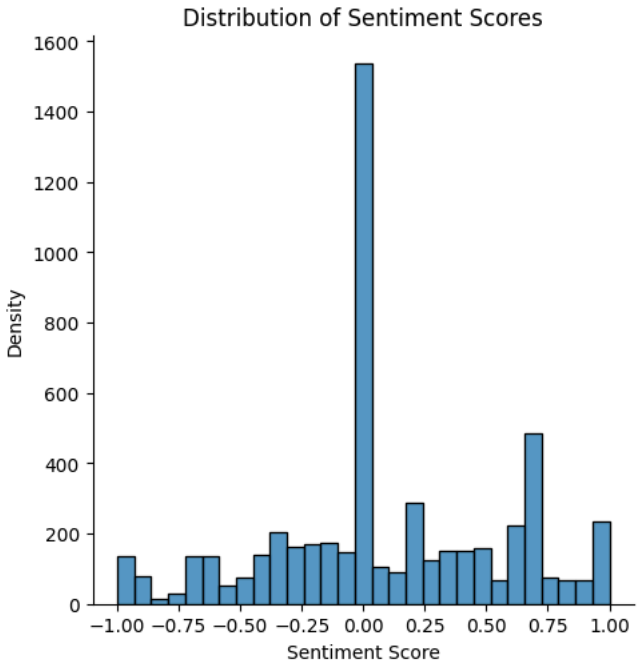
```
sen ='like review hesit spend much pair jean howev purchas retail day honestli look good probabl would paid full price jean fresh'
res=test_model(sen)
print(res)
```

```
from textblob import TextBlob
import matplotlib.pyplot as plt
import seaborn as sns

# Function to get sentiment
def get_sentiment(text):
    # Creating a TextBlob object
    blob = TextBlob(str(text))
    return blob.sentiment.polarity

# Apply the function to reviews
df['sentiment'] = df['review'].apply(get_sentiment)

sns.displot(df['sentiment'])
plt.title('Distribution of Sentiment Scores')
plt.xlabel('Sentiment Score')
plt.ylabel('Density')
plt.show()
df.head()
```



	Unnamed: 0	rating	review	sentiment
0	0	5	nice	0.600000
1	1	5	best biryani , so supportive staff of outlet ,...	0.616667
2	2	4	delivery boy was very decent and supportive.👌👍	0.216667
3	3	1	worst biryani i have tasted in my life, half o...	-0.583333
4	4	5	all food is good and tasty . will order again ...	0.600000

```
import nltk
nltk.download('stopwords')

ps =PorterStemmer()

def preprocess_text(text):
    review=re.sub("[^a-zA-Z]"," ",text)
    review=review.lower()
    review=review.split()
    review=[ps.stem(word) for word in review if word not in set(stopwords.words("english"))]
    review=" ".join(review)
    return review
```

```
[nltk_data] Downloading package stopwords to /root/nltk_data...
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```

```
df=df[['review']].dropna()
```

```
df['cleaned_data'] = df['review'].apply(preprocess_text)
```

```
df
```

	review	cleaned_data
0	nice	nice

```
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.decomposition import LatentDirichletAllocation

# Vectorization
tfidf_vectorizer = TfidfVectorizer(max_features=1000)
tfidf_matrix = tfidf_vectorizer.fit_transform(df['cleaned_data'])

# Topic Modeling (LDA)
num_topics = 5
lda_model = LatentDirichletAllocation(n_components=num_topics, random_state=42)
lda_model.fit(tfidf_matrix)

# Print the topics and their top keywords
def print_top_words(model, feature_names, n_top_words):
    for topic_idx, topic in enumerate(model.components_):
        print(f"Topic #{topic_idx}:")
        print(" ".join([feature_names[i] for i in topic.argsort()[:-n_top_words - 1:-1]]))
        print()

print_top_words(lda_model, tfidf_vectorizer.get_feature_names_out(), 10)
```

```
Topic #0:
bad food order tast tasti br money wast horribl spici

Topic #1:
nice quantiti food less qualiti worst tast super price class

Topic #2:
deliveri best order br food excel time late delici great

Topic #3:
biryani tha ok chicken like salad amaz br poor hai

Topic #4:
good tast test food pack servic br awesom cold item
```

```
Start coding or generate with AI.
```