Dataset

```
from nltk.util import pr
import pandas as pd
import numpy as np
from sklearn.feature_extraction.text import CountVectorizer
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
import re
import nltk
stemmer = nltk.SnowballStemmer("english")
from nltk.corpus import stopwords
import string
nltk.download("stopwords")
from nltk.corpus import stopwords
stopword = set(stopwords.words('english'))
data = pd.read_csv("https://raw.githubusercontent.com/shakil1819/NLTK-LSTM-Based-Hate-Speech-Detection/main/Dataset/labeled_data.csv")
print(data.head())
```

```
[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Unzipping corpora/stopwords.zip.
```

```
   Unnamed: 0  count  hate_speech  offensive_language  neither  class
\
0           0      3            0                   0        3      2

1           1      3            0                   3        0      1

2           2      3            0                   3        0      1

3           3      3            0                   2        1      1

4           4      6            0                   6        0      1



                                               tweet
0  !!! RT @mayasolovely: As a woman you shouldn't...
1  !!!!! RT @mleew17: boy dats cold...tyga dwn ba...
2  !!!!!!! RT @UrKindOfBrand Dawg!!!! RT @80sbaby...
3  !!!!!!!!! RT @C_G_Anderson: @viva_based she lo...
4  !!!!!!!!!!!!! RT @ShenikaRoberts: The shit you...
```

Labeling The Dataset

```
data["labels"] = data["class"].map({0: "Hate Speech",
                                    1: "Offensive Language",
                                    2: "No Hate and No Offensive"})
print(data.head())
```

```
   Unnamed: 0  count  hate_speech  offensive_language  neither  class  
\
0           0      3            0                   0        3      2   

1           1      3            0                   3        0      1   

2           2      3            0                   3        0      1   

3           3      3            0                   2        1      1   

4           4      6            0                   6        0      1   


                                               tweet  
labels  
0  !!! RT @mayasolovely: As a woman you shouldn't...  No Hate and No 
Offensive  
1  !!!!! RT @mleew17: boy dats cold...tyga dwn ba...        Offensive 
Language  
2  !!!!!!! RT @UrKindOfBrand Dawg!!!! RT @80sbaby...        Offensive 
Language  
3  !!!!!!!!! RT @C_G_Anderson: @viva_based she lo...        Offensive 
Language  
4  !!!!!!!!!!!!! RT @ShenikaRoberts: The shit you...        Offensive 
Language  

data = data[["tweet", "labels"]]
print(data.head())

                                               tweet  
labels  
0  !!! RT @mayasolovely: As a woman you shouldn't...  No Hate and No 
Offensive  
1  !!!!! RT @mleew17: boy dats cold...tyga dwn ba...        Offensive 
Language  
2  !!!!!!! RT @UrKindOfBrand Dawg!!!! RT @80sbaby...        Offensive 
Language  
3  !!!!!!!!! RT @C_G_Anderson: @viva_based she lo...        Offensive 
Language  
4  !!!!!!!!!!!!! RT @ShenikaRoberts: The shit you...        Offensive 
Language  
```

Dataset Cleaning

```
def clean(text):
    text = str(text).lower()
    text = re.sub('\[.*?\]', '', 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)
    text = [word for word in text.split(' ') if word not in stopword]
    text=" ".join(text)
    text = [stemmer.stem(word) for word in text.split(' ')]
    text=" ".join(text)
    return text
data["tweet"] = data["tweet"].apply(clean)
print(data["tweet"].head())
```

```
0      rt mayasolov woman shouldnt complain clean ho...
1      rt  boy dat coldtyga dwn bad cuffin dat hoe  ...
2      rt urkindofbrand dawg rt  ever fuck bitch sta...
3                rt cganderson vivabas look like tranni
4      rt shenikarobert shit hear might true might f...
Name: tweet, dtype: object
```

Splitting test and train dataset

```
x = np.array(data["tweet"])
y = np.array(data["labels"])

cv = CountVectorizer()
X = cv.fit_transform(x) # Fit the Data
X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size=0.33, random_state=42)

clf = DecisionTreeClassifier()
clf.fit(X_train,y_train)
```

```
DecisionTreeClassifier()
```

Detector

```
# sample = "Let's unite and kill all the people who are protesting
against the government"
sample = "Let's leave this country"
data = cv.transform([sample]).toarray()
print(clf.predict(data))
```

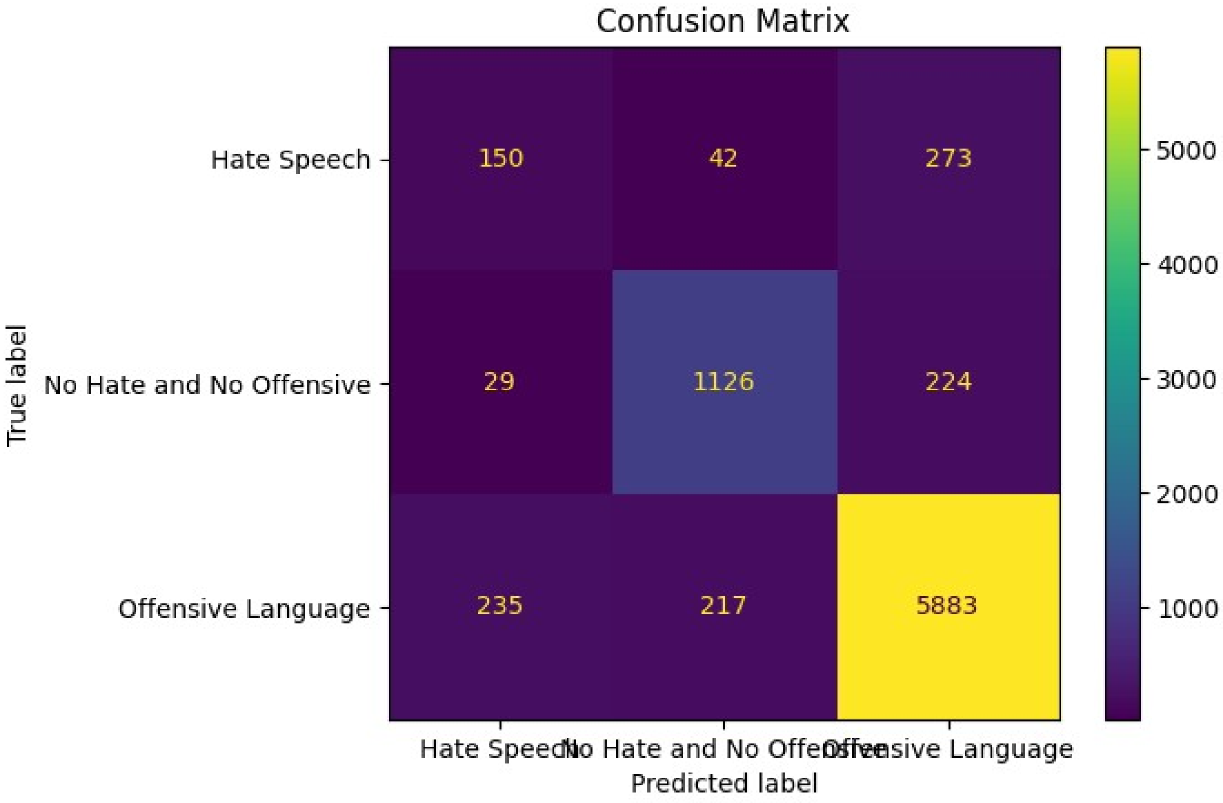
```
['Offensive Language']
```

Visualization

```
from sklearn.metrics import confusion_matrix, ConfusionMatrixDisplay,
classification_report
import matplotlib.pyplot as plt

# Add model predictions
y_pred = clf.predict(X_test)
```

```python
# Model Accuracy
print("Accuracy:", np.mean(y_pred == y_test))
#Classification Report
y_true = y_test
y_pred = clf.predict(X_test)

# Print classification report
print("---------------------------------------------------------------
----------------------------------------")
print(classification_report(y_true, y_pred))
print("---------------------------------------------------------------
----------------------------------------")

# Confusion Matrix
cm = confusion_matrix(y_test, y_pred)
disp = ConfusionMatrixDisplay(confusion_matrix=cm,
display_labels=clf.classes_)
disp.plot(include_values=True, cmap='viridis', ax=plt.gca())
plt.title("Confusion Matrix")
plt.xlabel("Predicted label")
plt.ylabel("True label")
plt.show()
```

```
Accuracy: 0.8752903777967966
----------------------------------------------------------------------
---------------------------------
                          precision    recall  f1-score   support

             Hate Speech       0.36      0.32      0.34       465
No Hate and No Offensive       0.81      0.82      0.81      1379
      Offensive Language       0.92      0.93      0.93      6335

                accuracy                           0.88      8179
               macro avg       0.70      0.69      0.69      8179
            weighted avg       0.87      0.88      0.87      8179

----------------------------------------------------------------------
---------------------------------
```


Confusion Matrix
True label
Hate Speech
No Hate and No Offensive
Offensive Language
150
42
273
29
1126
224
235
217
5883
Hate Speech
No Hate and No Offensive
Offensive Language
Predicted label
5000
4000
3000
2000
1000