```
# This Python 3 environment comes with many helpful analytics
libraries installed
# It is defined by the kaggle/python Docker image:
https://github.com/kaggle/docker-python
# For example, here's several helpful packages to load

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)

# Input data files are available in the read-only "../input/"
directory
# For example, running this (by clicking run or pressing Shift+Enter)
will list all files under the input directory

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 20GB to the current directory (/kaggle/working/)
that gets preserved as output when you create a version using "Save &
Run All"
# You can also write temporary files to /kaggle/temp/, but they won't
be saved outside of the current session

import io
import pickle
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt

tdf =
pickle.load(open('../input/testandtrain/test_with_lemm_2.pkl','rb'))
main_df =
pickle.load(open('../input/testandtrain/train_with_lemm_2.pkl','rb'))

tdf['text']
```

```
0                                       interview execution
1        know post truthful admins hate wont anything e...
2               z youre real bore go bore someone else twt
3        yet remain confusion mention sac withdraw berg...
4             refer lose interest vandalise talk page dark
                               ...
38292    please refrain remove content wikipedia storm ...
38293                                                  utc
38294    list girl alphabetical order kep move victoria...
38295    dumb fuck delete angry nintendo nerd page dumb...
38296    fine job would never find log lok carefuly ima...
Name: text, Length: 38297, dtype: object
```

```
main_df

                         id  \
0      a8be7c5d4527adbbf15f   
1      0b7ca73f388222aad64d   
2      db934381501872ba6f38   
3      228015c4a87c4b1f09a7   
4      b18f26cfa1408b52e949   
...                     ...   
89354  748a13233c1ea91c4584   
89355  e49b832cc766ee220113   
89356  ff4751b348157ac2b585   
89357  94a3215b11a49ba57d61   
89358  fa56881999d000a21cf1   

                                                    text  harsh  \
0      utci interest argue policy resolve ongoing con...      0   
1      aded mising parameter templateinfobox organiza...      0   
2                                  sandbox madre sandbox      1   
3      god sir sir obviously comprehend importance sc...      1   
4      source incase forget someone else want pick gr...      0   
...                                                  ...    ...   
89354                   becuase critic actualy read boks      0   
89355  youre go technical boyd never post goglegroups...      0   
89356  join u fb helo pakistani wikipedians asalamoal...      0   
89357     lockhart update reference denis lockhart mwala      0   
89358         whole section bad format neds writen clear      0   

       extremely_harsh  vulgar  threatening  disrespect  targeted_hate  

0                    0       0            0           0              0  

1                    0       0            0           0              0  

2                    0       0            0           0              0  

3                    0       1            1           1              0  

4                    0       0            0           0              0  

...                ...     ...          ...         ...            ...  

89354                0       0            0           0              0  

89355                0       0            0           0              0  

89356                0       0            0           0              0  

89357                0       0            0           0              0  
```

```
89358                0       0            0           0              0


[89359 rows x 8 columns]
```

```
tdf.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 38297 entries, 0 to 38296
Data columns (total 2 columns):
 #   Column  Non-Null Count  Dtype 
---  ------  --------------  ----- 
 0   id      38297 non-null  object
 1   text    38297 non-null  object
dtypes: object(2)
memory usage: 598.5+ KB
```

Classifier Chain

```
# using classifier chains
from skmultilearn.problem_transform import ClassifierChain
from sklearn.linear_model import LogisticRegression
from sklearn.feature_extraction.text import TfidfVectorizer
```

```
x_train = main_df['text'].head(15000)
x_train
```

```
0        utci interest argue policy resolve ongoing con...
1        aded mising parameter templateinfobox organiza...
2                                    sandbox madre sandbox
3        god sir sir obviously comprehend importance sc...
4        source incase forget someone else want pick gr...
                               ...                        
14995    thank im expert string instrument help bagpipe...
14996    actualy mention source late article open artic...
14997    rofl thats thing hasnt hapened yet along selfb...
14998    age since time doesnt realy pa show homer age ...
14999    like great job thanksi especialy like fact peo...
Name: text, Length: 15000, dtype: object
```

```
y_train = main_df.drop(labels = ['id','text'], axis=1).head(15000)
y_train
```

```
       harsh  extremely_harsh  vulgar  threatening  disrespect  
targeted_hate
0          0                0       0            0           0  
0
1          0                0       0            0           0  
0
2          1                0       0            0           0  
0
```

```
3          1                0       1           1          1
0
4          0                0       0           0          0
0
...      ...              ...     ...         ...        ...
...
14995      0                0       0           0          0
0
14996      0                0       0           0          0
0
14997      0                0       0           0          0
0
14998      0                0       0           0          0
0
14999      0                0       0           0          0
0

[15000 rows x 6 columns]
```

```
x_test = tdf['text']
type(x_test)
```

```
pandas.core.series.Series
```

```
tfidf = TfidfVectorizer()

x_train_tfidf = tfidf.fit_transform(x_train)
x_test_tfidf = tfidf.transform(x_test)
```

```
# initialize classifier chains multi-label classifier
classifier = ClassifierChain(LogisticRegression())
# Training logistic regression model on train data
classifier.fit(x_train_tfidf, y_train)
```

```
ClassifierChain(classifier=LogisticRegression(), require_dense=[True,
True])
```

```
# predict
y_pred = classifier.predict_proba(x_test_tfidf)
```

```
y_pred
```

```
<38297x6 sparse matrix of type '<class 'numpy.float64'>'
     with 229782 stored elements in Compressed Sparse Column format>
```

```
labels = main_df.iloc[:,2:8]
labels
```

```
       harsh  extremely_harsh  vulgar  threatening  disrespect
targeted_hate
0          0                0       0           0          0
0
```

```
1          0                0       0            0           0
0
2          1                0       0            0           0
0
3          1                0       1            1           1
0
4          0                0       0            0           0
0
...      ...              ...     ...          ...         ...
...
89354      0                0       0            0           0
0
89355      0                0       0            0           0
0
89356      0                0       0            0           0
0
89357      0                0       0            0           0
0
89358      0                0       0            0           0
0

[89359 rows x 6 columns]
```

```
y_pred = y_pred.toarray()
```

```
y_pred_df = pd.DataFrame(y_pred,columns = labels.columns)
y_pred_df
```

```
          harsh  extremely_harsh    vulgar  threatening  disrespect  \
0      0.104800         0.000434  0.003618     0.000612    0.003690
1      0.223649         0.000247  0.004230     0.000542    0.003266
2      0.260670         0.000412  0.005378     0.000697    0.004370
3      0.051655         0.000377  0.004041     0.000593    0.002871
4      0.044735         0.000317  0.002791     0.000507    0.002061
...         ...              ...       ...          ...         ...
38292  0.006338         0.000229  0.002424     0.000462    0.001774
38293  0.018515         0.000413  0.002908     0.000582    0.003344
38294  0.039060         0.000395  0.004204     0.000546    0.003274
38295  0.986294         0.234234  0.931438     0.025603    0.905458
38296  0.020765         0.000277  0.002789     0.000577    0.002523

       targeted_hate
0           0.000846
1           0.000702
2           0.000805
3           0.000711
4           0.000661
...              ...
38292       0.000477
38293       0.000778
38294       0.000604
```

```
38295       0.088567
38296       0.000762

[38297 rows x 6 columns]
```

```
submission_df = pd.concat([tdf.id,y_pred_df],axis=1)
submission_df.to_csv('submission.csv',index = False)
```

Label Powerset

```
# using Label Powerset
from skmultilearn.problem_transform import LabelPowerset
from sklearn.linear_model import LogisticRegression
from sklearn.feature_extraction.text import TfidfVectorizer
```

```
x_train = main_df['text'].head(10000)
x_train
```

```
y_train = main_df.drop(labels = ['id','text'], axis=1).head(10000)
y_train
```

```
x_test = tdf['text']
x_test
```

```
tfidf = TfidfVectorizer()

x_train_tfidf = tfidf.fit_transform(x_train)
x_test_tfidf = tfidf.transform(x_test)
```

```
classifier = LabelPowerset(LogisticRegression())
# Training logistic regression model on train data
classifier.fit(x_train_tfidf, y_train)
```

```
# predict
y_pred = classifier.predict_proba(x_test_tfidf)
```

```
y_pred = y_pred.toarray()
```

```
labels = main_df.iloc[:,2:8]
labels
```

```
y_pred.shape
```

```
y_pred_df = pd.DataFrame(y_pred,columns = labels.columns)
y_pred_df
```

```
submission_df = pd.concat([tdf.id,y_pred_df],axis=1)
submission_df.to_csv('submission.csv',index = False)
```

MLknn

```
#from skmultilearn.adapt import MLkNN
from scipy.sparse import csr_matrix, lil_matrix
from sklearn.feature_extraction.text import TfidfVectorizer
```

```
#k=6 since there are 6 labels
classifier_new = MLkNN(k=6)

x_train = main_df['text'].head(10000)
x_train

y_train = main_df.drop(labels = ['id','text'], axis=1).head(10000)
y_train

x_test = tdf['text']
x_test

tfidf = TfidfVectorizer()

x_train_tfidf = tfidf.fit_transform(x_train)
x_test_tfidf = tfidf.transform(x_test)

x_train_tfidf = lil_matrix(x_train_tfidf).toarray()
y_train = lil_matrix(y_train).toarray()
x_test_tfidf = lil_matrix(x_test_tfidf).toarray()

# train
classifier_new.fit(x_train_tfidf, y_train)

# predict
y_pred = classifier_new.predict(x_test_tfidf)
```

Linear SVC

```
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.svm import LinearSVC
from sklearn.multiclass import OneVsRestClassifier
from sklearn.pipeline import Pipeline
from sklearn.calibration import CalibratedClassifierCV
from sklearn.metrics import classification_report

X_train = main_df['text']

y_train = main_df.drop(labels = ['id','text'], axis=1)

categories = main_df.iloc[:,2:8].columns

X_test = tdf['text']

SVC_pipeline = Pipeline([
                ('tfidf', TfidfVectorizer()),
                ('clf', OneVsRestClassifier(LinearSVC())),
            ])
for category in categories:
    print('... Processing {}'.format(category))
    # train the model using X_dtm & y
    SVC_pipeline.fit(X_train, y_train[category])
    # compute the testing accuracy
    prediction = SVC_pipeline.predict(X_test)
```

since we have to find probability of labels we cannot directly use onevsrest because of the error : This 'OneVsRestClassifier' has no attribute 'predict_proba'

```
SVC_pipeline = Pipeline([
                ('tfidf', TfidfVectorizer()),
                ('clf', CalibratedClassifierCV(LinearSVC(C = 10))),
            ])
cla = OneVsRestClassifier(SVC_pipeline)
cla.fit(X_train, y_train)
```

```
OneVsRestClassifier(estimator=Pipeline(steps=[('tfidf',
TfidfVectorizer()),
                                              ('clf',

CalibratedClassifierCV(base_estimator=LinearSVC(C=10)))]))
```

```
y_pred_svc = cla.predict_proba(X_test)
```

```
y_pred_svc.shape
```

```
(38297, 6)
```

```
y_pred_svc
```

```
array([[1.70391107e-01, 4.44953455e-03, 1.97591234e-03, 6.81200640e-
04,
        1.79114300e-03, 1.96399698e-03],
       [5.60333981e-01, 1.06906238e-02, 2.79940220e-02, 2.02496465e-
03,
        1.06263908e-01, 3.09471682e-03],
       [2.92418769e-01, 3.10111041e-03, 1.02386010e-01, 1.06203947e-
03,
        6.31791555e-02, 7.71424120e-03],
       ...,
       [6.97491675e-03, 5.16868318e-04, 8.57713607e-03, 1.77557770e-
04,
        2.28373323e-02, 1.17974089e-03],
       [9.99998869e-01, 5.78736406e-01, 9.99903357e-01, 8.99214208e-
03,
        9.77605332e-01, 2.53610878e-02],
       [9.98316264e-03, 2.28602266e-03, 1.20480085e-03, 1.46304882e-
04,
        2.38564816e-03, 8.47497354e-04]])
```

```
y_pred_df = pd.DataFrame(y_pred_svc,columns = categories)
y_pred_df
```

```
          harsh  extremely_harsh    vulgar  threatening  disrespect  \
0      0.170391         0.004450  0.001976     0.000681    0.001791
1      0.560334         0.010691  0.027994     0.002025    0.106264
2      0.292419         0.003101  0.102386     0.001062    0.063179
3      0.011533         0.002475  0.001515     0.000366    0.000608
```

```
4      0.048458         0.012955  0.006402     0.000080    0.012449
...         ...              ...       ...          ...         ...
38292  0.002313         0.000599  0.006705     0.000555    0.003945
38293  0.000486         0.012229  0.003478     0.000057    0.003488
38294  0.006975         0.000517  0.008577     0.000178    0.022837
38295  0.999999         0.578736  0.999903     0.008992    0.977605
38296  0.009983         0.002286  0.001205     0.000146    0.002386

       targeted_hate
0           0.001964
1           0.003095
2           0.007714
3           0.002441
4           0.000395
...              ...
38292       0.001124
38293       0.001334
38294       0.001180
38295       0.025361
38296       0.000847

[38297 rows x 6 columns]
```

```
submission_df = pd.concat([tdf.id,y_pred_df],axis=1)
submission_df.to_csv('submission.csv',index = False)
```

Decision Tree

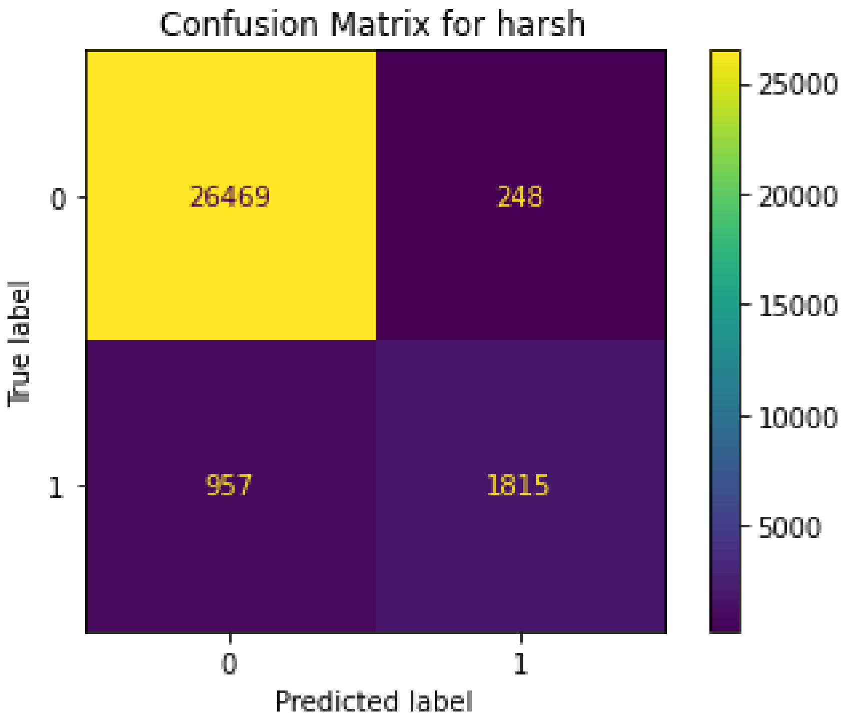
```
from sklearn.tree import DecisionTreeClassifier
from sklearn.feature_extraction.text import TfidfVectorizer

X_train = main_df['text']

y_train = main_df.drop(labels = ['id','text'], axis=1)

X_test = tdf['text']

tfidf = TfidfVectorizer()


x_train_tfidf = tfidf.fit_transform(X_train)
x_test_tfidf = tfidf.transform(X_test)

#Fitting Decision Tree classifier to the training set
classifier= DecisionTreeClassifier()
classifier.fit(x_train_tfidf, y_train)

y_pred_dt = classifier.predict_proba(x_test_tfidf)
#y_pred_lg = classifier.predict_log_proba(x_test_tfidf)

categories = main_df.iloc[:,2:8].columns

classifier.get_depth()
classifier.get_n_leaves()

y_pred_dt
# returning 3D array

y_pred_df_1 = pd.DataFrame(y_pred_dt,columns = categories)
y_pred_df_1
```

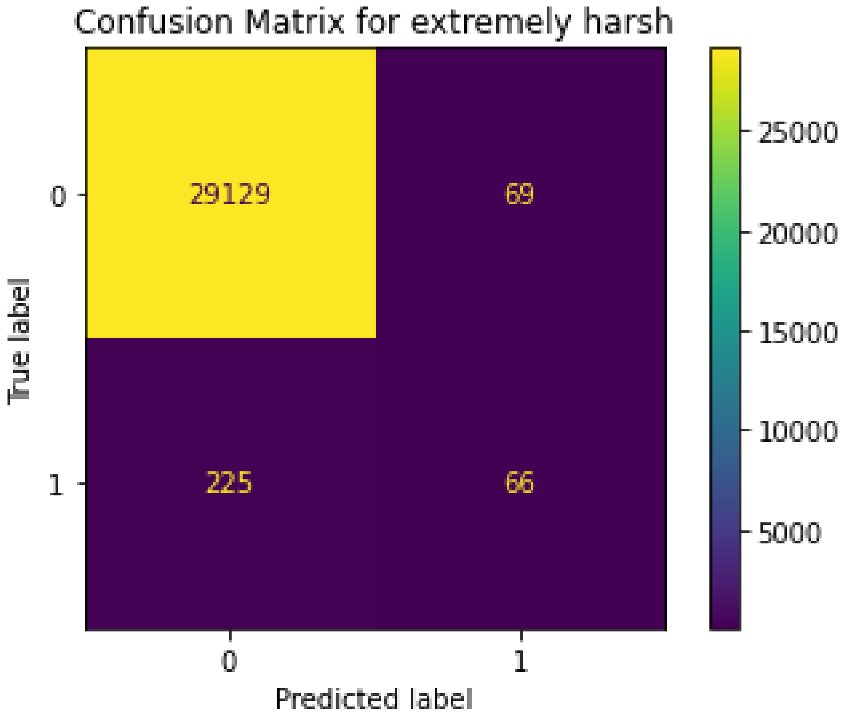
MultiOutput Classifier

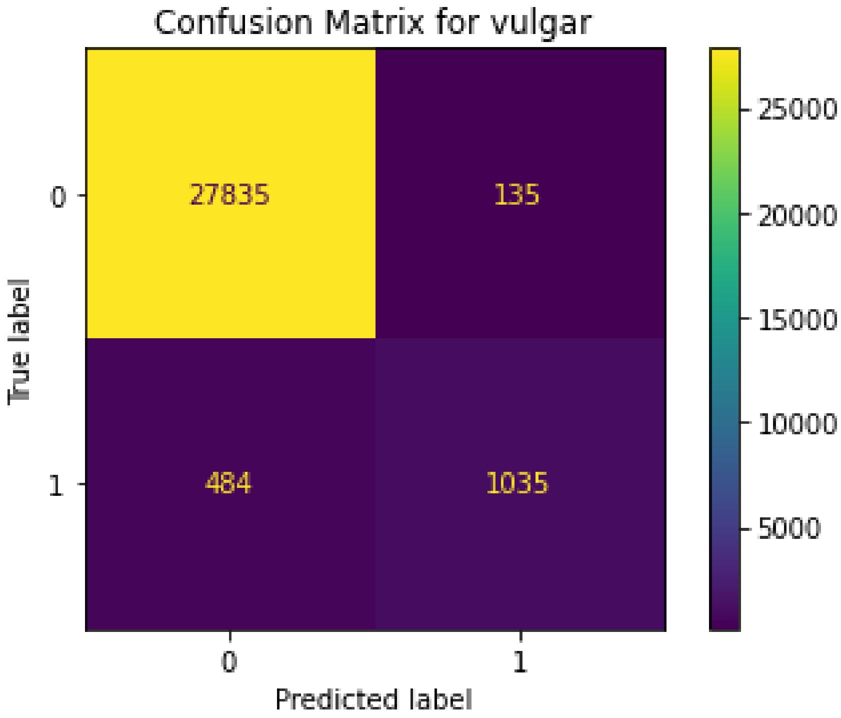
```
from sklearn.multioutput import MultiOutputClassifier
from sklearn.svm import LinearSVC
from sklearn.metrics import multilabel_confusion_matrix,
ConfusionMatrixDisplay
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.model_selection import train_test_split

X_train = main_df['text']

y_train = main_df.drop(labels = ['id','text'], axis=1)

X_test = tdf['text']

tfidf = TfidfVectorizer()


x_train_tfidf = tfidf.fit_transform(X_train)
x_test_tfidf = tfidf.transform(X_test)

# Split into training and testing data
X_train, X_test, y_train, y_test = train_test_split(x_train_tfidf,
y_train, test_size=0.33, random_state=42)

# Create the SVM
svm = LinearSVC()

# Make it an Multilabel classifier
multilabel_classifier = MultiOutputClassifier(svm, n_jobs=-1)

# Fit the data to the Multilabel classifier
multilabel_classifier = multilabel_classifier.fit(X_train, y_train)

# Get predictions for test data
y_test_pred = multilabel_classifier.predict(X_test)

# Generate multiclass confusion matrices
matrices = multilabel_confusion_matrix(y_test, y_test_pred)

matrices
```

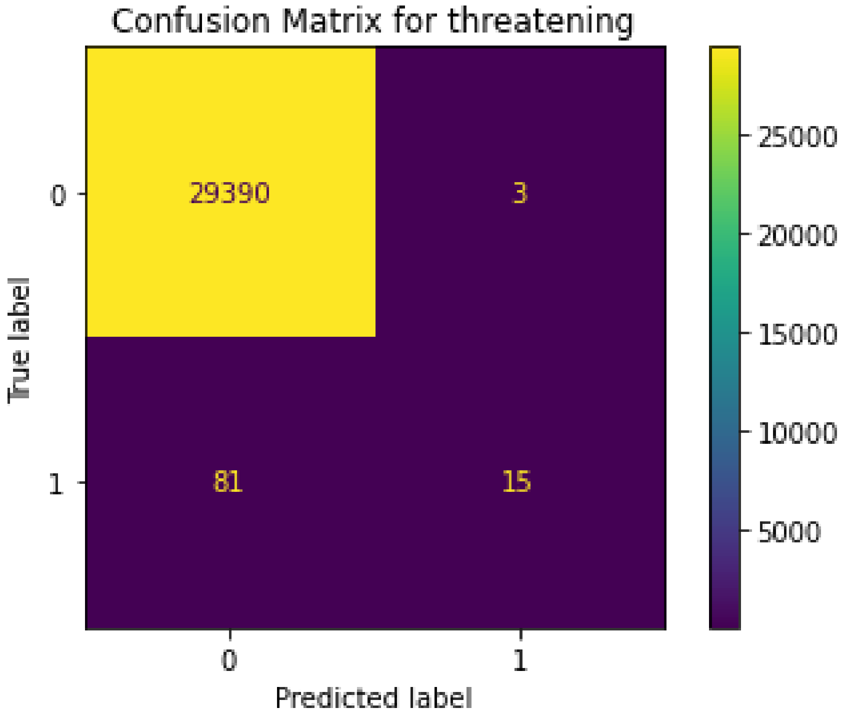
```
array([[[26469,   248],
        [  957,  1815]],

       [[29129,    69],
        [  225,    66]],

       [[27835,   135],
        [  484,  1035]],

       [[29390,     3],
        [   81,    15]],

       [[27883,   195],
        [  632,   779]],

       [[29210,    26],
        [  209,    44]]])
```

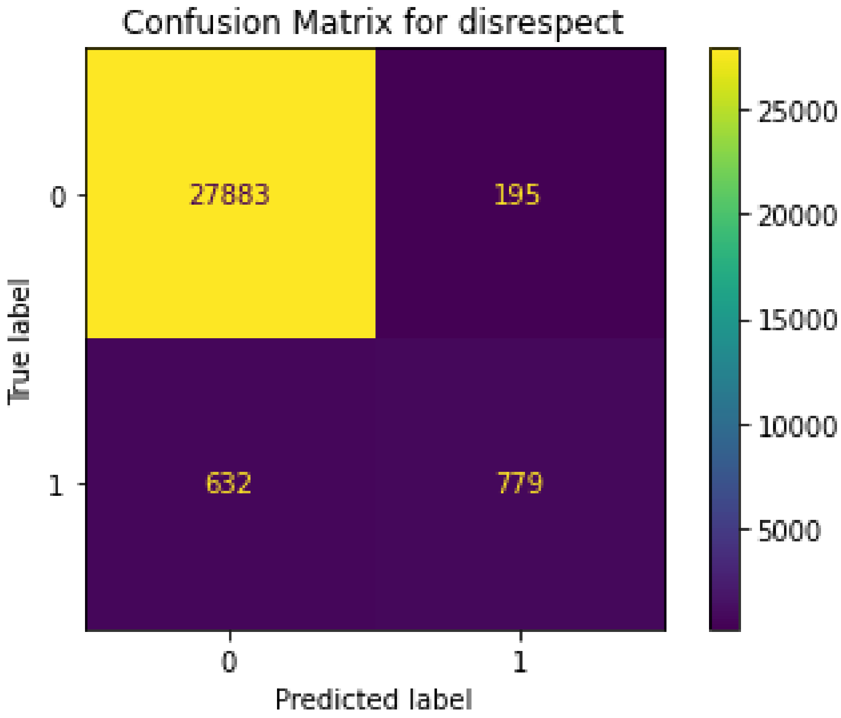
```
cmd = ConfusionMatrixDisplay(matrices[0],
display_labels=np.unique(y_test)).plot()
plt.title('Confusion Matrix for harsh')
plt.show()
cmd = ConfusionMatrixDisplay(matrices[1],
display_labels=np.unique(y_test)).plot()
plt.title('Confusion Matrix for extremely harsh')
plt.show()
cmd = ConfusionMatrixDisplay(matrices[2],
display_labels=np.unique(y_test)).plot()
plt.title('Confusion Matrix for vulgar')
plt.show()
cmd = ConfusionMatrixDisplay(matrices[3],
display_labels=np.unique(y_test)).plot()
plt.title('Confusion Matrix for threatening')
plt.show()
cmd = ConfusionMatrixDisplay(matrices[4],
display_labels=np.unique(y_test)).plot()
plt.title('Confusion Matrix for disrespect')
plt.show()
cmd = ConfusionMatrixDisplay(matrices[5],
display_labels=np.unique(y_test)).plot()
plt.title('Confusion Matrix for targeted_hate')
plt.show()
```

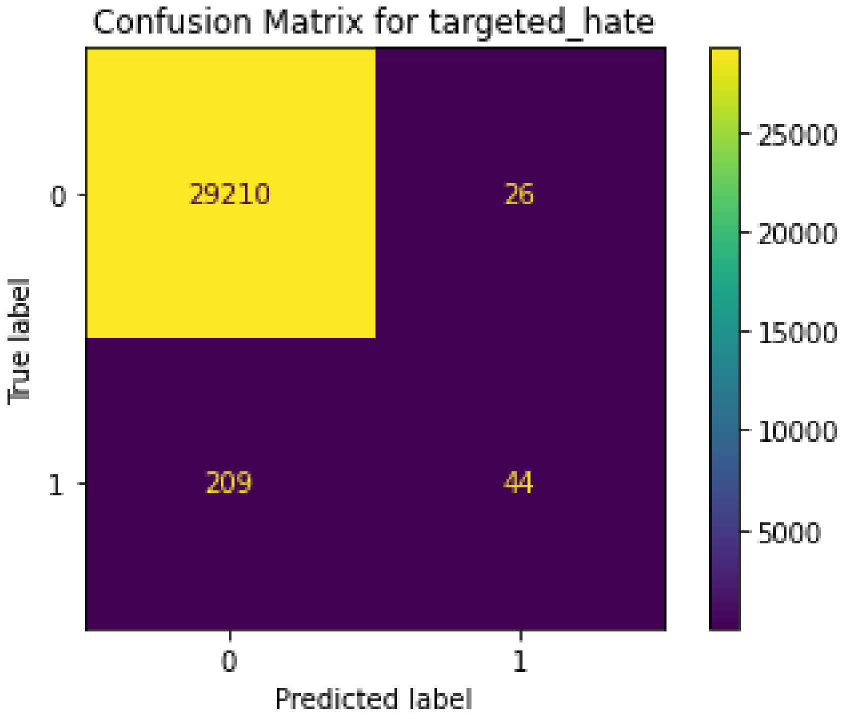

Confusion Matrix for harsh


Confusion Matrix for extremely harsh


Confusion Matrix for vulgar
True label
Predicted label
0
1
0
1
27835
135
484
1035
25000
20000
15000
10000
5000


Confusion Matrix for threatening
True label
Predicted label
0
1
0
1
29390
3
81
15
25000
20000
15000
10000
5000





```
y_train.shape
```

```
(59870, 6)
```

```
yy = y_train.head(29489)
```

```
y_test_pred.shape
```

```
(29489, 6)
```

```
# Accuracy
from sklearn.metrics import accuracy_score
accuracy_score(yy, y_test_pred)*100
```

```
83.44806538031129
```

XGBoost

```
from xgboost import XGBClassifier
from sklearn.feature_extraction.text import TfidfVectorizer

X_train = main_df['text']

y_train = main_df.drop(labels = ['id','text'], axis=1)

X_test = tdf['text']

tfidf = TfidfVectorizer()


x_train_tfidf = tfidf.fit_transform(X_train)
x_test_tfidf = tfidf.transform(X_test)

xgb_clf = XGBClassifier()
xgb_clf.fit(x_train_tfidf, y_train)
```

```
XGBClassifier(base_score=0.5, booster='gbtree', callbacks=None,
              colsample_bylevel=1, colsample_bynode=1,
colsample_bytree=1,
              early_stopping_rounds=None, enable_categorical=False,
              eval_metric=None, gamma=0, gpu_id=-1,
grow_policy='depthwise',
              importance_type=None, interaction_constraints='',
              learning_rate=0.300000012, max_bin=256,
max_cat_to_onehot=4,
              max_delta_step=0, max_depth=6, max_leaves=0,
min_child_weight=1,
              missing=nan, monotone_constraints='()',
n_estimators=100,
              n_jobs=0, num_parallel_tree=1, predictor='auto',
random_state=0,
              reg_alpha=0, reg_lambda=1, ...)
```

```
y_pred = xgb_clf.predict_proba(x_test_tfidf)

categories = main_df.iloc[:,2:8].columns

y_pred_df = pd.DataFrame(y_pred,columns = categories)
y_pred_df
```

```
          harsh  extremely_harsh    vulgar  threatening  disrespect  \
0      0.059576         0.003772  0.020237     0.000704    0.024908   
1      0.672233         0.000125  0.006000     0.000057    0.052414   
2      0.153774         0.009824  0.020903     0.003273    0.047614   
3      0.028054         0.000649  0.006546     0.000230    0.004386   
4      0.023089         0.001458  0.007860     0.000088    0.006149   
...         ...              ...       ...          ...         ...   
38292  0.001813         0.000036  0.000861     0.000020    0.001565   
38293  0.024186         0.003772  0.012379     0.000704    0.014865   
38294  0.018855         0.000219  0.004046     0.000182    0.005519   
38295  0.999288         0.641275  0.978244     0.000736    0.967045   
38296  0.012892         0.000694  0.001294     0.000107    0.003027   

       targeted_hate  
0           0.004147  
1           0.002133  
2           0.007809  
3           0.001016  
4           0.000375  
...              ...  
38292       0.000081  
38293       0.004147  
38294       0.000328  
38295       0.129180  
38296       0.000429  

[38297 rows x 6 columns]
```

```
submission_df = pd.concat([tdf.id,y_pred_df],axis=1)
submission_df.to_csv('submission.csv',index = False)
```

Ridge Classifier

```
from sklearn.linear_model import Ridge
from sklearn import linear_model
from sklearn.linear_model import RidgeClassifier
from scipy.sparse import hstack

X_train = main_df['text']

y_train = main_df.drop(labels = ['id','text'], axis=1)

X_test = tdf['text']

tfidf = TfidfVectorizer()

x_train_tfidf = tfidf.fit_transform(X_train)
x_test_tfidf = tfidf.transform(X_test)

x_train_tfidf
```

```
<15000x46612 sparse matrix of type '<class 'numpy.float64'>'
	with 395855 stored elements in Compressed Sparse Row format>
```

```
x_test_tfidf
```

```
<38297x46612 sparse matrix of type '<class 'numpy.float64'>'
	with 901920 stored elements in Compressed Sparse Row format>
```

```
predict_dic = pd.DataFrame(columns=['harsh', 'extremely_harsh',
'vulgar', 'threatening', 'disrespect', 'targeted_hate'])
```

```
categories = main_df.iloc[:,2:8].columns
```

```
char_vectorizer = TfidfVectorizer (
    sublinear_tf = True,
    strip_accents = 'unicode', # Remove accents and perform other
character normalization during the preprocessing step.
                               # ‘ascii’ is a fast method that only
works on characters that have an direct ASCII mapping.
                               # ‘unicode’ is a slightly slower method
that works on any characters.
    analyzer = 'char',
    ngram_range = (2, 4),  # ngram is the set of n words together.
    min_df = 2,
    max_df = 0.5,
    max_features = 20000
)
char_vectorizer.fit(main_df) # We fit on complete training + test data
so as to achieve a better fit.
train_char_features = char_vectorizer.transform(X_train)
test_char_features = char_vectorizer.transform(X_test)
```

```
word_vectorizer = TfidfVectorizer(
    sublinear_tf = True,  # It seems unlikely that twenty occurrences
of a term in a document truly carry twenty times the significance of a
single occurrence.
    # Accordingly, there has been considerable research into variants
of term frequency that go beyond counting the number of occurrences of
a term.
    # A common modification is to use instead the logarithm of the
term frequency, which assigns a weight. 1 + log(tf)
    strip_accents = 'unicode', # Remove accents and perform other
character normalization during the preprocessing step.
                               # ‘ascii’ is a fast method that only
works on characters that have an direct ASCII mapping.
                               # ‘unicode’ is a slightly slower method
that works on any characters.
    analyzer = 'word',  # Whether the feature should be made of word
or character.
    token_pattern = '(?u)\\b\\w\\w+\\b\\w{,1}',
    lowercase = False,  # Do not convert the uppercase letters into
lowercase because they carry significance.
    stop_words = 'english',  # Remove all the stop words of english
    # ngram is the set of n words together.
    ngram_range = (1, 1),  # We consider set of 1 or 2 words together
for tokenization.
    min_df = 1,
    max_df = 0.25,
    norm = 'l2',
    max_features = 30000
) #lowercase = true : convert all characters into lower case before
tokenzing
word_vectorizer.fit(main_df) # Apply tfidf fitting on the whole
preprocessed text data so that we schieve a better fitted model.
train_word_features = word_vectorizer.transform(X_train)
test_word_features = word_vectorizer.transform(X_test)

train_features = hstack([train_char_features, train_word_features])
test_features = hstack([test_char_features, test_word_features])

predict_dic['id'] = tdf['id']
overall_score = []
for x in categories:
        print('... Processing {}'.format(x))
        class_column = labels[x].values
        score = 0
        if x in ['targeted_hate', 'threatening']:
            model = LogisticRegression(n_jobs=-1, random_state=0, C=3)
            model.fit(train_features,labels[x])
            predict_dic[x] = model.predict_proba(test_features)
[:,1].tolist()
        else:
            rid =  RidgeClassifier(alpha=17,fit_intercept=True,
solver='sag', max_iter=250,random_state=0,tol = 0.0005)
            rid.fit(train_features,labels[x])
            d = rid.decision_function(test_features)
            probs = np.exp(d) / np.sum(np.exp(d))
            predict_dic[x] = probs.tolist()
```

```
... Processing harsh
... Processing extremely_harsh
... Processing vulgar
... Processing threatening
... Processing disrespect
... Processing targeted_hate
```

```
predict_dic
```

```
          harsh  extremely_harsh    vulgar  threatening  disrespect  \
0      0.000027         0.000026  0.000026     0.002141    0.000026
1      0.000022         0.000025  0.000023     0.001209    0.000024
2      0.000026         0.000026  0.000026     0.002231    0.000026
```

```
3      0.000026         0.000026  0.000026     0.002484    0.000026
4      0.000024         0.000026  0.000025     0.001204    0.000025
...         ...              ...       ...          ...         ...
38292  0.000024         0.000026  0.000024     0.001290    0.000025
38293  0.000033         0.000027  0.000031     0.006388    0.000030
38294  0.000025         0.000026  0.000026     0.001457    0.000025
38295  0.000029         0.000027  0.000028     0.002641    0.000028
38296  0.000024         0.000026  0.000024     0.001098    0.000025

       targeted_hate                    id
0           0.021840  e0ae9d9474a5689a5791
1           0.003734  b64a191301cad4f11287
2           0.007583  5e1953d9ae04bdc66408
3           0.005820  23128f98196c8e8f7b90
4           0.005248  2d3f1254f71472bf2b78
...              ...                   ...
38292       0.007616  64ebe2494b078bc1ec18
38293       0.022400  16259bc32bd803e6acf5
38294       0.004577  1fe631c9625d88a4d492
38295       0.013245  085ab9387dce9d4e0b68
38296       0.008266  4fb0f98b22a4f4469fcf

[38297 rows x 7 columns]
```

```
submission_df = pd.concat([tdf.id,predict_dic],axis=1)
submission_df.to_csv('submission.csv',index = False)
```