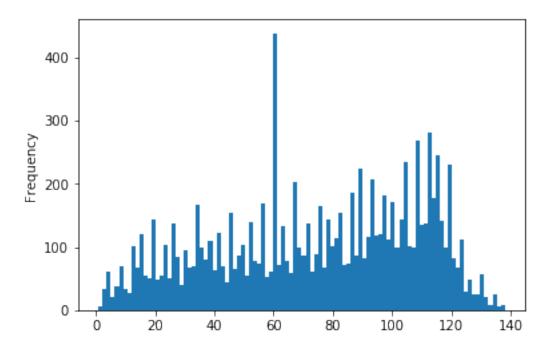
# Naive\_Bayes\_SMV\_comparation\_Classifiers

#### January 7, 2019

```
In [51]: from nltk.tokenize import word_tokenize
         from nltk.corpus import stopwords
         from nltk.stem import PorterStemmer
         import matplotlib.pyplot as plt
         from math import log, sqrt
         import pandas as pd
         import numpy as np
         import string
         from sklearn import feature_extraction, model_selection, naive_bayes, metrics, svm
         import seaborn as sns
         %matplotlib inline
        Tweets = pd.read_csv('dataset13.csv')
        Tweets.head()
Out [51]:
                                                       Tweets Label
                                                                            Name
        O egypt s official news agency mena website hack...
                                                                  1 AkincilarCW
         1 middle east news agency the state news agency ...
                                                                  1 AkincilarCW
        2 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                  0 AkincilarCW
        3 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                  0 AkincilarCW
        4 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                0 AkincilarCW
In [52]: Tweets.describe()
Out [52]:
                                                            Tweets Label \
                                                             10208 10204
         count
        unique
                 down by mr p r dox anonghost anonymous tangodo...
                                                                        0
        top
        freq
                                                               266
                                                                     7679
                          Name
                         10208
         count
                            30
        unique
        top
                 GhostSecGroup
                           400
        freq
In [53]: Tweets.groupby('Label').describe()
```

```
Out [53]:
                Name
                                               Tweets
               count unique
                                      top freq count unique
         Label
         0
                7679
                         30
                                 birlesik 398
                                                 7679
                                                         3430
                2524
                              AnonGhostCJ
                                                 2524
         1
                         27
                                           276
                                                         1147
                          1 CgAn_Doemela
                                                            1
                                             1
                                                               top freq
         Label
         0
                down by mr p r dox anonghost anonymous tangodo...
         1
                                             ar crushdaesh opisis
                                                                     40
                safeguard your data and privacy online with th...
         х
                                                                      1
In [54]: Tweets['length'] = Tweets['Tweets'].apply(len)
         Tweets.head()
Out [54]:
                                                        Tweets Label
                                                                             Name
         O egypt s official news agency mena website hack...
                                                                   1 AkincilarCW
         1 middle east news agency the state news agency ...
                                                                   1 AkincilarCW
         2 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                   0 AkincilarCW
         3 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                   0 AkincilarCW
         4 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                   0 AkincilarCW
            length
         0
               120
               123
         1
         2
                79
         3
                70
         4
                60
In [55]: Tweets['length'].plot(bins=100,kind='hist')
```

Out [55]: <matplotlib.axes.\_subplots.AxesSubplot at 0x7f4b40b95e48>



In [56]: Tweets.length.describe() Out[56]: count 10208.000000 74.446904 mean std 33.980693 1.000000 min 25% 48.000000 50% 78.000000 75% 104.000000 138.000000 maxName: length, dtype: float64 In [57]: Tweets[Tweets['length']==138]['Tweets'].iloc[0] Out[57]: 'im not a trump supporter but i do find it distressing that hillary supporters feel v In [58]: def text\_process(mess): nopunc =[char for char in mess if char not in string.punctuation] nopunc=''.join(nopunc) return [word for word in nopunc.split() if word.lower() not in stopwords.words('ex Tweets.head() Out [58]: Tweets Label O egypt s official news agency mena website hack... 1 AkincilarCW

1 AkincilarCW

1 middle east news agency the state news agency ...

```
2 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                0 AkincilarCW
         3 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                  0 AkincilarCW
         4 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                  0 AkincilarCW
            length
         0
               120
         1
               123
         2
                79
         3
                70
         4
                60
In [59]: Tweets['Tweets'].head(5).apply(text_process)
Out[59]: 0
              [egypt, official, news, agency, mena, website,...
         1
              [middle, east, news, agency, state, news, agen...
              [rk, hackerlar, r, resmi, haber, ajans, n, n, ...
              [rk, hackerlar, r, resmi, haber, ajans, n, n, ...
              [rk, hackerlar, r, resmi, haber, ajans, n, n, ...
         Name: Tweets, dtype: object
In [60]: #Tweets['Tweets'].plot(bins=100,kind='bar')
In [61]: Tweets.length.describe()
Out[61]: count
                  10208.000000
                     74.446904
         mean
         std
                     33.980693
                      1.000000
         min
         25%
                     48.000000
         50%
                     78.000000
         75%
                    104.000000
                    138.000000
         max
         Name: length, dtype: float64
In [62]: Tweets.head()
Out [62]:
                                                       Tweets Label
                                                                             Name
         O egypt s official news agency mena website hack...
                                                                  1 AkincilarCW
         1 middle east news agency the state news agency ...
                                                                  1 AkincilarCW
         2 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                  0 AkincilarCW
         3 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                  0 AkincilarCW
         4 t rk hackerlar m s r resmi haber ajans n n sit...
                                                                  0 AkincilarCW
            length
               120
         0
         1
               123
         2
                79
         3
                70
         4
                60
```

```
In [63]: from sklearn.feature_extraction.text import CountVectorizer
         bow_transformer = CountVectorizer(analyzer=text_process).fit(Tweets['Tweets'])
         print(len(bow_transformer.vocabulary_))
12786
In [64]: Tweets4=Tweets['Tweets'][3]
        print(Tweets4)
t rk hackerlar m s r resmi haber ajans n n sitesini hackledi haberturk
In [65]: bow4=bow_transformer.transform([Tweets4])
         print(bow4)
         print(bow4.shape)
  (0, 293)
                  1
  (0, 4798)
                   1
  (0, 4801)
                   1
  (0, 4820)
                   1
  (0, 4830)
                   1
  (0, 7494)
                   2
  (0, 9188)
                   1
  (0, 9499)
                   1
  (0, 9649)
                   1
  (0, 10407)
                    1
(1, 12786)
In [66]: print(bow_transformer.get_feature_names()[4073])
         print(bow_transformer.get_feature_names()[9570])
fights
rex
In [67]: Tweets_bow = bow_transformer.transform(Tweets['Tweets'])
         print('Shape of Sparse Matrix: ',Tweets_bow.shape)
         print('Amount of non-zero occurences:',Tweets_bow.nnz)
Shape of Sparse Matrix: (10208, 12786)
Amount of non-zero occurences: 92322
In [68]: sparsity =(100.0 * Tweets_bow.nnz/(Tweets_bow.shape[0]*Tweets_bow.shape[1]))
         print('sparsity:{}'.format(round(sparsity)))
```

```
sparsity:0
In [69]: from sklearn.feature_extraction.text import TfidfTransformer
         tfidf_transformer=TfidfTransformer().fit(Tweets_bow)
         tfidf4 = tfidf_transformer.transform(bow4)
         print(tfidf4)
  (0, 10407)
                   0.33194878482925727
  (0, 9649)
                   0.2542100646254636
  (0, 9499)
                   0.3253362984280295
  (0, 9188)
                   0.1757977571317432
  (0, 7494)
                   0.35105390688748034
  (0, 4830)
                   0.3119541299893323
  (0, 4820)
                   0.3168676119627846
  (0, 4801)
                 0.4126672996744178
  (0, 4798)
                  0.3054170206496304
  (0, 293)
                  0.32234379754178394
In [70]: print(tfidf_transformer.idf_[bow_transformer.vocabulary_['hacked']])
         print(tfidf_transformer.idf_[bow_transformer.vocabulary_['cked']])
4.257215351299754
8.285114814113701
In [71]: Tweets_tfidf=tfidf_transformer.transform(Tweets_bow)
         print(Tweets_tfidf.shape)
         #df[cat] = le.fit transform(df[cat].astype(str))
(10208, 12786)
In [72]: from sklearn.naive_bayes import MultinomialNB
         from sklearn.model_selection import train_test_split
In [73]: X_train, X_test, y_train, y_test = train_test_split(Tweets_tfidf, Tweets['Label'].val
         print('Training Data', [np.shape(X_train), 'Test Data', np.shape(X_test)])
Training Data [(6839, 12786), 'Test Data', (3369, 12786)]
In [74]: list_alpha = np.arange(1/100000, 20, 0.11)
         score_train = np.zeros(len(list_alpha))
         score_test = np.zeros(len(list_alpha))
```

recall\_test = np.zeros(len(list\_alpha))
precision\_test= np.zeros(len(list\_alpha))

count = 0

```
for alpha in list_alpha:
             bayes = naive_bayes.MultinomialNB(alpha=alpha)
             bayes.fit(X_train, y_train)
             score_train[count] = bayes.score(X_train, y_train)
             score_test[count] = bayes.score(X_test, y_test)
             recall_test[count] = metrics.recall_score(y_test, bayes.predict(X_test),average='ng')
             precision_test[count] = metrics.precision_score(y_test, bayes.predict(X_test),ave.
             count = count + 1
In [79]: matrix = np.matrix(np.c_[list_alpha, score_train, score_test, recall_test, precision_
         models = pd.DataFrame(data = matrix, columns =
                      ['alpha', 'Train Accuracy', 'Test Accuracy', 'Test Recall', 'Test Precis
         models.head(n=10)
Out [79]:
              alpha Train Accuracy Test Accuracy Test Recall Test Precision
         0 0.00001
                           0.975874
                                          0.907391
                                                       0.907391
                                                                       0.907391
         1 0.11001
                                          0.910359
                           0.967832
                                                       0.910359
                                                                       0.910359
         2 0.22001
                           0.964322
                                          0.910359
                                                       0.910359
                                                                       0.910359
         3 0.33001
                           0.963445
                                          0.910359
                                                       0.910359
                                                                       0.910359
         4 0.44001
                           0.960813
                                          0.909766
                                                       0.909766
                                                                       0.909766
                           0.955695
         5 0.55001
                                          0.912140
                                                       0.912140
                                                                       0.912140
         6 0.66001
                           0.949700
                                          0.911250
                                                       0.911250
                                                                       0.911250
         7 0.77001
                           0.942535
                                          0.909172
                                                       0.909172
                                                                       0.909172
         8 0.88001
                                                       0.906500
                                                                       0.906500
                           0.934493
                                          0.906500
         9 0.99001
                           0.928352
                                          0.897596
                                                       0.897596
                                                                       0.897596
In [80]: best_index = models['Test Precision'].idxmax()
         models.iloc[best_index, :]
Out[80]: alpha
                           0.550010
         Train Accuracy
                           0.955695
         Test Accuracy
                           0.912140
         Test Recall
                           0.912140
         Test Precision
                           0.912140
         Name: 5, dtype: float64
In [81]: models[models['Test Precision']>0.9].head(n=5)
Out[81]:
              alpha Train Accuracy Test Accuracy Test Recall Test Precision
         0 0.00001
                           0.975874
                                          0.907391
                                                       0.907391
                                                                       0.907391
         1 0.11001
                           0.967832
                                          0.910359
                                                       0.910359
                                                                       0.910359
         2 0.22001
                           0.964322
                                          0.910359
                                                       0.910359
                                                                       0.910359
         3 0.33001
                           0.963445
                                          0.910359
                                                       0.910359
                                                                       0.910359
         4 0.44001
                           0.960813
                                          0.909766
                                                                       0.909766
                                                       0.909766
In [82]: best_index = models[models['Test Precision']>0.912]['Test Accuracy'].idxmax()
         bayes = naive_bayes.MultinomialNB(alpha=list_alpha[best_index])
         bayes.fit(X_train, y_train)
         models.iloc[best_index, :]
```

7449

### 1 Confusion Matrix with Naive Bayes

```
In [36]: m_confusion_test = metrics.confusion_matrix(y_test, bayes.predict(X_test))
         #pd.DataFrame([m_confusion_test], columns = ['Predicted 0', 'Predicted 1'],
                    # index = ['Actual 0', 'Actual 1'])
         pd.DataFrame([m_confusion_test], columns = ['Predicted 0', 'Predicted 1'],
                     index = ['Actual 0', 'Actual 1'])
        ValueError
                                                  Traceback (most recent call last)
        <ipython-input-36-143034b434fb> in <module>
                       # index = ['Actual 0', 'Actual 1'])
          4 pd.DataFrame([m_confusion_test], columns = ['Predicted 0'],
                        index = ['Actual 0'])
    ---> 5
        /opt/jupyterhub/anaconda/lib/python3.6/site-packages/pandas/core/frame.py in __init__(
        401
                            else:
        402
                                mgr = self._init_ndarray(data, index, columns, dtype=dtype,
    --> 403
                                                          copy=copy)
        404
                        else:
        405
                            mgr = self._init_dict({}, index, columns, dtype=dtype)
        /opt/jupyterhub/anaconda/lib/python3.6/site-packages/pandas/core/frame.py in _init_nda:
                    # by definition an array here
        513
                    # the dtypes will be coerced to a single dtype
        514
                    values = _prep_ndarray(values, copy=copy)
    --> 515
        516
        517
                    if dtype is not None:
        /opt/jupyterhub/anaconda/lib/python3.6/site-packages/pandas/core/frame.py in _prep_nda
                    values = values.reshape((values.shape[0], 1))
       7446
       7447
                elif values.ndim != 2:
    -> 7448
                    raise ValueError('Must pass 2-d input')
```

ValueError: Must pass 2-d input

### 2 Support Vector Machine

```
In [30]: list_C = np.arange(500, 2000, 100) #100000
         score_train = np.zeros(len(list_C))
         score_test = np.zeros(len(list_C))
         recall_test = np.zeros(len(list_C))
         precision_test= np.zeros(len(list_C))
         count = 0
         for C in list_C:
             svc = svm.SVC(C=C)
             svc.fit(X_train, y_train)
             score_train[count] = svc.score(X_train, y_train)
             score_test[count] = svc.score(X_test, y_test)
             recall_test[count] = metrics.recall_score(y_test, svc.predict(X_test),average='mi
             precision_test[count] = metrics.precision_score(y_test, svc.predict(X_test), avera
             count = count + 1
/opt/jupyterhub/anaconda/lib/python3.6/site-packages/sklearn/svm/base.py:196: FutureWarning: T.
  "avoid this warning.", FutureWarning)
In [83]: matrix = np.matrix(np.c_[list_C, score_train, score_test, recall_test, precision_test
         models = pd.DataFrame(data = matrix, columns =
                      ['C', 'Train Accuracy', 'Test Accuracy', 'Test Recall', 'Test Precision']
         models.head(n=15)
        ValueError
                                                  Traceback (most recent call last)
        <ipython-input-83-9203747bd982> in <module>
    ----> 1 matrix = np.matrix(np.c_[list_C, score_train, score_test, recall_test, precision_te
          2 models = pd.DataFrame(data = matrix, columns =
                         ['C', 'Train Accuracy', 'Test Accuracy', 'Test Recall', 'Test Precision'
          4 models.head(n=15)
        /opt/jupyterhub/anaconda/lib/python3.6/site-packages/numpy/lib/index_tricks.py in __ge
                            objs[k] = objs[k].astype(final_dtype)
        333
        334
    --> 335
                    res = self.concatenate(tuple(objs), axis=axis)
```

```
336
        337
                    if matrix:
        ValueError: all the input array dimensions except for the concatenation axis must match
In [32]: best_index = models['Test Precision'].idxmax()
         models.iloc[best_index, :]
Out[32]: C
                           1900.000000
                              0.914900
         Train Accuracy
                              0.899377
         Test Accuracy
         Test Recall
                              0.899377
         Test Precision
                              0.899377
         Name: 14, dtype: float64
In [33]: models[models['Test Precision']>0.8].head(n=5)
Out [33]:
                C Train Accuracy Test Accuracy Test Recall Test Precision
                                        0.832294
         0 500.0
                         0.834479
                                                      0.832294
                                                                      0.832294
         1 600.0
                         0.843983
                                        0.839121
                                                      0.839121
                                                                      0.839121
         2 700.0
                         0.854072
                                        0.848917
                                                      0.848917
                                                                      0.848917
         3 800.0
                         0.864308
                                        0.853072
                                                     0.853072
                                                                      0.853072
         4 900.0
                         0.870449
                                        0.863164
                                                     0.863164
                                                                      0.863164
In [34]: best_index = models[models['Test Precision']>0.8]['Test Accuracy'].idxmax()
         svc = svm.SVC(C=list_C[best_index])
         svc.fit(X_train, y_train)
         models.iloc[best_index, :]
Out [34]: C
                           1900.000000
         Train Accuracy
                              0.914900
         Test Accuracy
                              0.899377
         Test Recall
                              0.899377
         Test Precision
                              0.899377
         Name: 14, dtype: float64
```

## 3 Confusion Matrix with supported Vector Machine

```
<ipython-input-35-1705192903bc> in <module>
          1 m_confusion_test = metrics.confusion_matrix(y_test, svc.predict(X_test))
          2 pd.DataFrame(data = m_confusion_test, columns = ['Predicted 0', 'Predicted 1'],
                        row = ['Actual 0', 'Actual 1'])
   ---> 3
        TypeError: __init__() got an unexpected keyword argument 'row'
In [84]: hacktivist_detect_model = MultinomialNB().fit(X_train,y_train)
In [71]: i=0
         while(True):
             print('predicted:',hacktivist_detect_model.predict(Tweets_tfidf)[i])
             print('expected:',Tweets.Label[i])
             i=i+1
predicted: 1
expected: 1
predicted: 0
expected: 1
predicted: 0
expected: 0
```

predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0

predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0

predicted: 1 expected: 1 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0

predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 1 expected: 0 predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 1 expected: 1 predicted: 0

predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1

predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1

predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1

predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1

predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1

predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 0 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1

predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 1 predicted: 1 expected: 1 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 1 predicted: 1 expected: 1

predicted: 0

predicted: 0

predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 1 expected: 0 predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 0 predicted: 0 expected: 1 predicted: 0 expected: 0 predicted: 0

predicted: 0 expected: 0 predicted: 0

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```
expected: 0
predicted: 0
expected: 1
predicted: 0
expected: 0
predicted: 0
expected: 1
                                                  Traceback (most recent call last)
        IndexError
        <ipython-input-71-97c1d5ac87eb> in <module>
          1 i=0
          2 while(True):
                print('predicted:',hacktivist_detect_model.predict(Tweets_tfidf)[i])
    ---> 3
                print('expected:',Tweets.Label[i])
```

predicted: 0

5

i=i+1

IndexError: index 10208 is out of bounds for axis 0 with size 10208