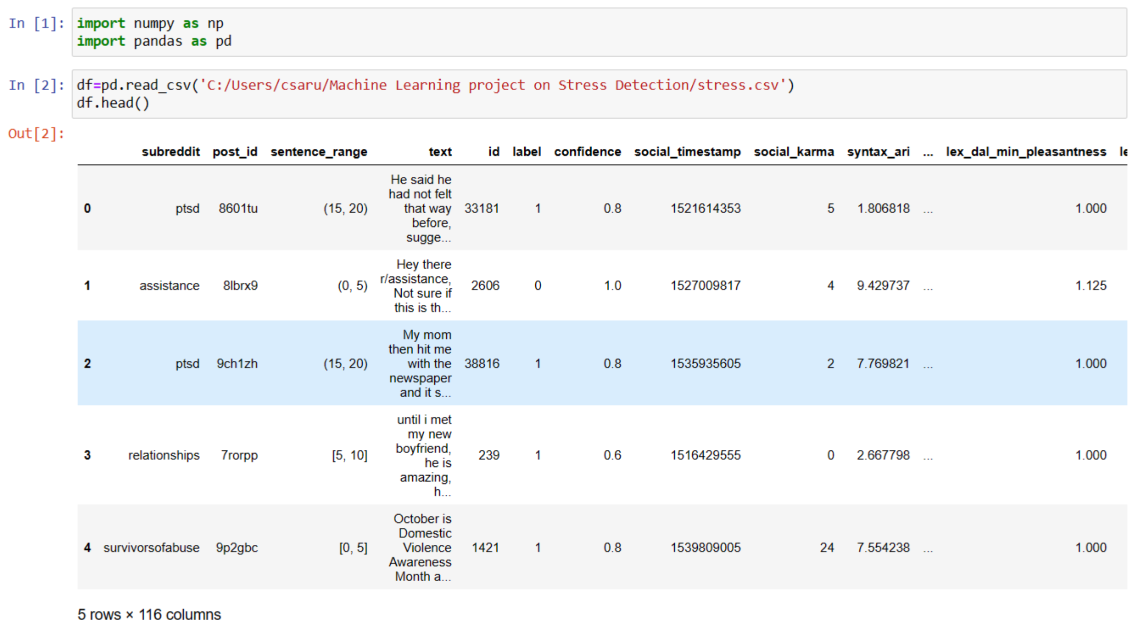
MACHINE LEARNING PROJECT ON STRESS DETECTION:

1. Now let’s start the task of stress detection with machine learning. I will start this task by importing the necessary Python libraries and the dataset that we need for this task:

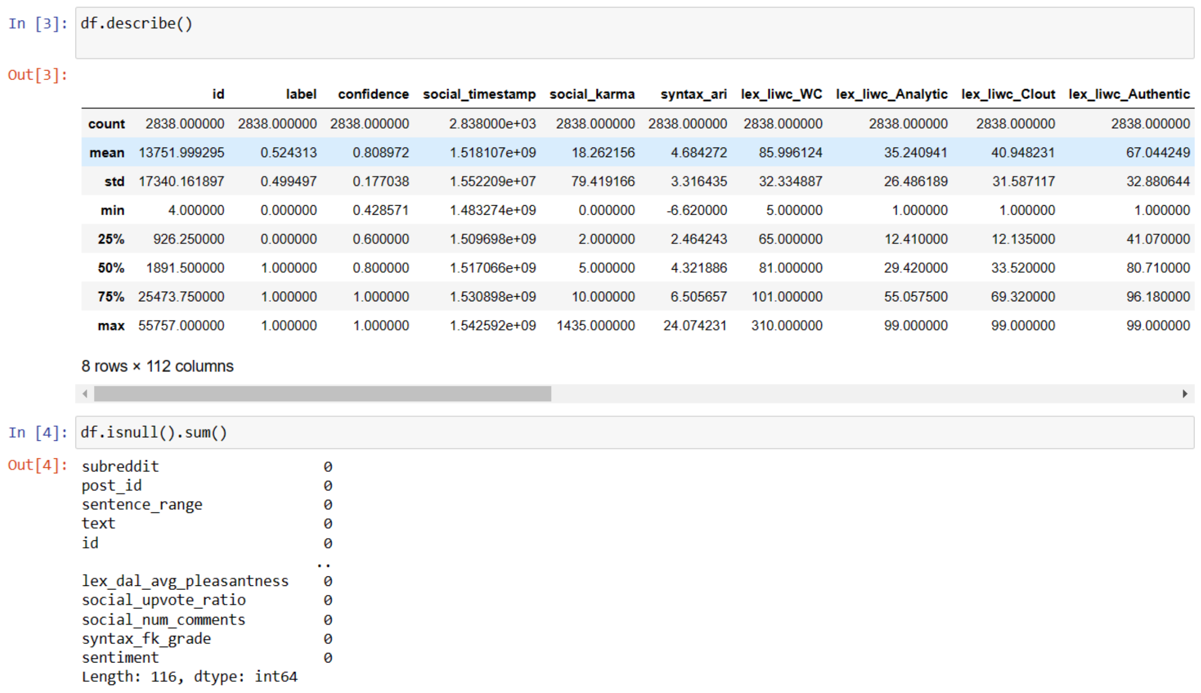


```
In [1]: import numpy as np
        import pandas as pd

In [2]: df=pd.read_csv('C:/Users/csaru/Machine Learning project on Stress Detection/stress.csv')
        df.head()

Out[2]:
```

	subreddit	post_id	sentence_range	text	id	label	confidence	social_timestamp	social_karma	syntax_ari	...	lex_dal_min_pleasantness	le
0	ptsd	8601tu	(15, 20)	He said he had not felt that way before, sugge...	33181	1	0.8	1521614353	5	1.806818	...	1.000	
1	assistance	8lbrx9	(0, 5)	Hey there r/assistance, Not sure if this is th...	2606	0	1.0	1527009817	4	9.429737	...	1.125	
2	ptsd	9ch1zh	(15, 20)	My mom then hit me with the newspaper and it s...	38816	1	0.8	1535935605	2	7.769821	...	1.000	
3	relationships	7rorpp	[5, 10]	until i met my new boyfriend, he is amazing, h...	239	1	0.6	1516429555	0	2.667798	...	1.000	
4	survivorsofabuse	9p2gbc	[0, 5]	October is Domestic Violence Awareness Month a...	1421	1	0.8	1539809005	24	7.554238	...	1.000	

5 rows × 116 columns

2. Let’s describe the dataset and have a look at whether this dataset contains any null values or not:



```
In [3]: df.describe()

Out[3]:
```

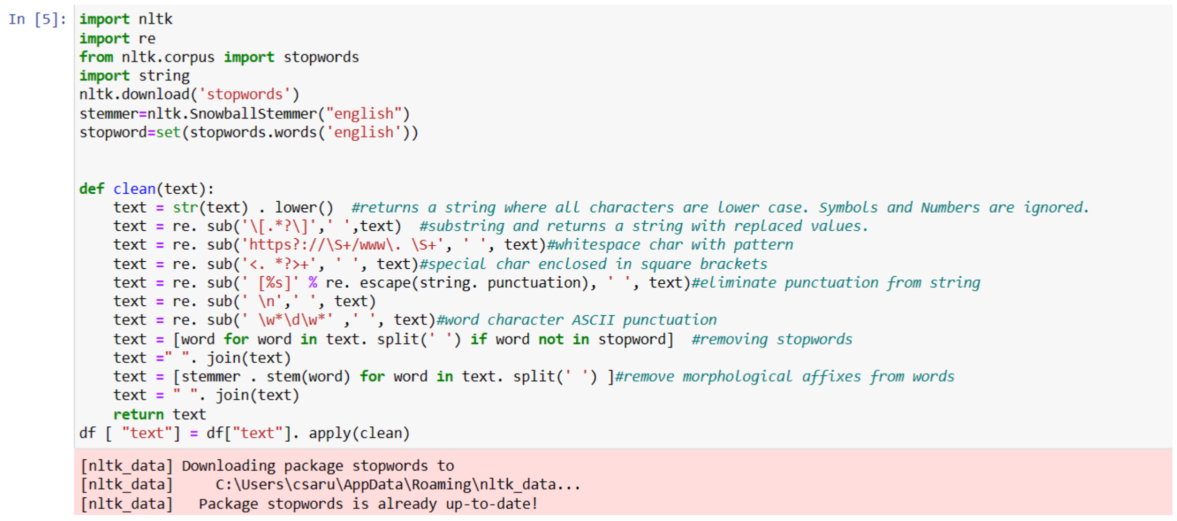
	id	label	confidence	social_timestamp	social_karma	syntax_ari	lex_liwc_WC	lex_liwc_Analytic	lex_liwc_Clout	lex_liwc_Authentic
count	2838.000000	2838.000000	2838.000000	2.838000e+03	2838.000000	2838.000000	2838.000000	2838.000000	2838.000000	2838.000000
mean	13751.999295	0.524313	0.808972	1.518107e+09	18.262156	4.684272	85.996124	35.240941	40.948231	67.044249
std	17340.161897	0.499497	0.177038	1.552209e+07	79.419166	3.316435	32.334887	26.486189	31.587117	32.880644
min	4.000000	0.000000	0.428571	1.483274e+09	0.000000	-6.620000	5.000000	1.000000	1.000000	1.000000
25%	926.250000	0.000000	0.600000	1.509698e+09	2.000000	2.464243	65.000000	12.410000	12.135000	41.070000
50%	1891.500000	1.000000	0.800000	1.517066e+09	5.000000	4.321886	81.000000	29.420000	33.520000	80.710000
75%	25473.750000	1.000000	1.000000	1.530898e+09	10.000000	6.505657	101.000000	55.057500	69.320000	96.180000
max	55757.000000	1.000000	1.000000	1.542592e+09	1435.000000	24.074231	310.000000	99.000000	99.000000	99.000000

8 rows × 112 columns

```
In [4]: df.isnull().sum()

Out[4]: subreddit                   0
        post_id                     0
        sentence_range              0
        text                        0
        id                          0
                                   ..
        lex_dal_avg_pleasantness    0
        social_upvote_ratio         0
        social_num_comments         0
        syntax_fk_grade             0
        sentiment                   0
        Length: 116, dtype: int64
```

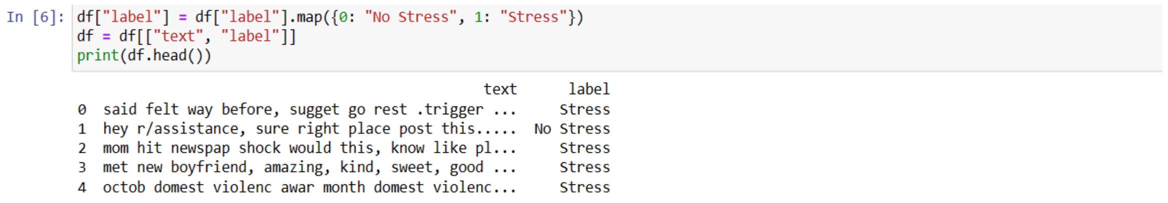
By ARUN. P

3. So this dataset does not have any null values. Now let’s prepare the text column of this dataset to clean the text column with stopwords, links, special symbols and language errors:



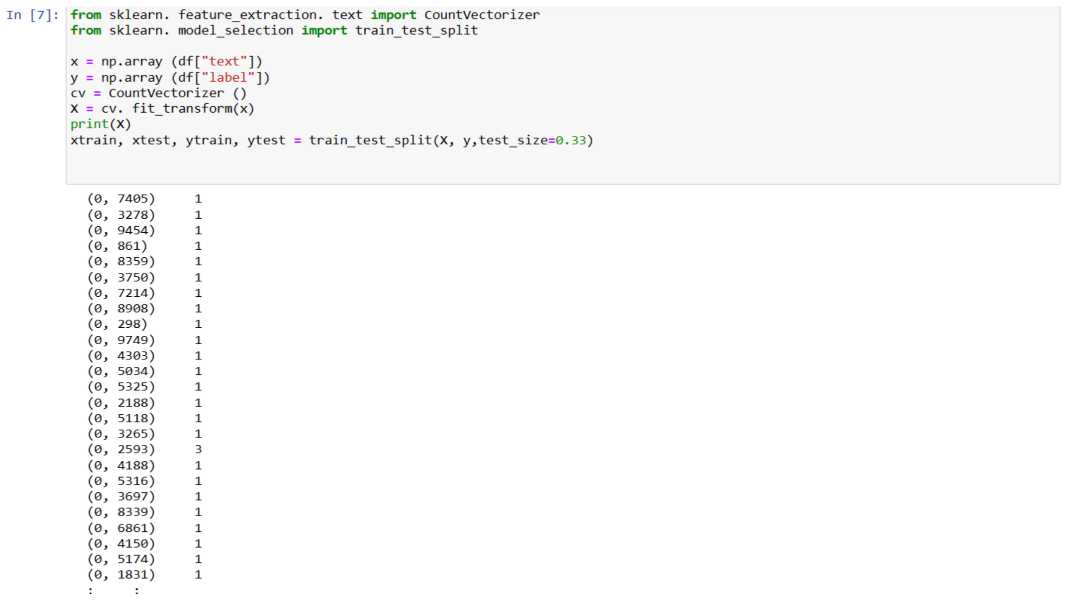
```
In [5]: import nltk
        import re
        from nltk.corpus import stopwords
        import string
        nltk.download('stopwords')
        stemmer=nltk.SnowballStemmer("english")
        stopword=set(stopwords.words('english'))


        def clean(text):
            text = str(text) . lower()  #returns a string where all characters are lower case. Symbols and Numbers are ignored.
            text = re. sub('\[.*?\]',' ',text)  #substring and returns a string with replaced values.
            text = re. sub('https?://\S+/www\. \S+', ' ', text)#whitespace char with pattern
            text = re. sub('<. *?>+', ' ', text)#special char enclosed in square brackets
            text = re. sub(' [%s]' % re. escape(string. punctuation), ' ', text)#eliminate punctuation from string
            text = re. sub(' \n',' ', text)
            text = re. sub(' \w*\d\w*' ,' ', text)#word character ASCII punctuation
            text = [word for word in text. split(' ') if word not in stopword]  #removing stopwords
            text =" ". join(text)
            text = [stemmer . stem(word) for word in text. split(' ') ]#remove morphological affixes from words
            text = " ". join(text)
            return text
        df [ "text"] = df["text"]. apply(clean)

        [nltk_data] Downloading package stopwords to
        [nltk_data]     C:\Users\csaru\AppData\Roaming\nltk_data...
        [nltk_data]   Package stopwords is already up-to-date!
```

4. The label column in this dataset contains labels as 0 and 1. 0 means no stress, and 1 means stress. I will use Stress and No stress labels instead of 1 and 0. So let’s prepare this column accordingly and select the text and label columns for the process of training a machine learning model:



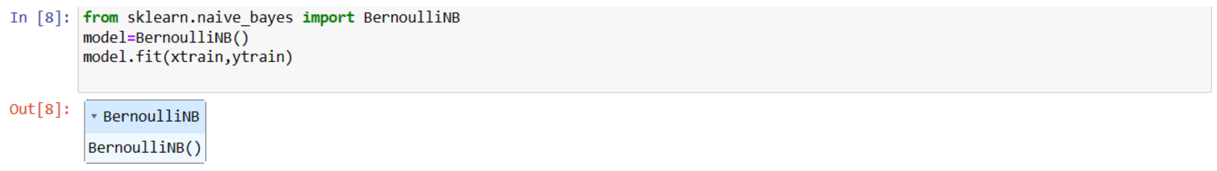
```
In [6]: df["label"] = df["label"].map({0: "No Stress", 1: "Stress"})
        df = df[["text", "label"]]
        print(df.head())

                                                text      label
        0  said felt way before, sugget go rest .trigger ...     Stress
        1  hey r/assistance, sure right place post this.....  No Stress
        2  mom hit newspap shock would this, know like pl...     Stress
        3  met new boyfriend, amazing, kind, sweet, good ...     Stress
        4  octob domest violenc awar month domest violenc...     Stress
```

5. Now I will split this dataset into training and test sets:



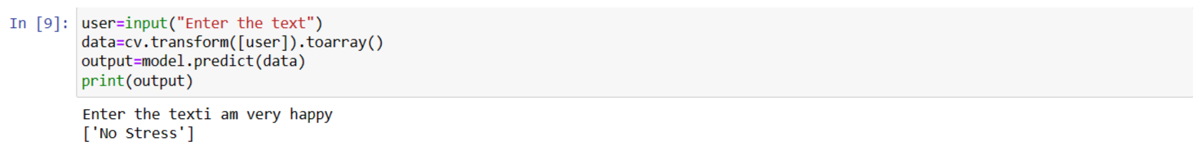
```
In [7]: from sklearn. feature_extraction. text import CountVectorizer
        from sklearn. model_selection import train_test_split

        x = np.array (df["text"])
        y = np.array (df["label"])
        cv = CountVectorizer ()
        X = cv. fit_transform(x)
        print(X)
        xtrain, xtest, ytrain, ytest = train_test_split(X, y,test_size=0.33)

          (0, 7405)     1
          (0, 3278)     1
          (0, 9454)     1
          (0, 861)      1
          (0, 8359)     1
          (0, 3750)     1
          (0, 7214)     1
          (0, 8908)     1
          (0, 298)      1
          (0, 9749)     1
          (0, 4303)     1
          (0, 5034)     1
          (0, 5325)     1
          (0, 2188)     1
          (0, 5118)     1
          (0, 3265)     1
          (0, 2593)     3
          (0, 4188)     1
          (0, 5316)     1
          (0, 3697)     1
          (0, 8339)     1
          (0, 6861)     1
          (0, 4150)     1
          (0, 5174)     1
          (0, 1831)     1
          :     :
```

6. As this task is based on the problem of binary classification, I will be using the Bernoulli Naive Bayes algorithm, which is one of the best algorithms for binary classification problems. So let's train the stress detection mode

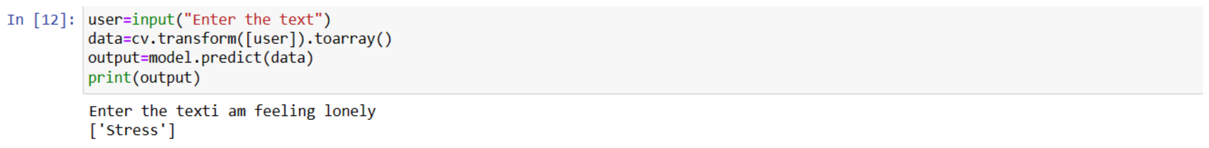


```
In [8]: from sklearn.naive_bayes import BernoulliNB
        model=BernoulliNB()
        model.fit(xtrain,ytrain)

Out[8]: ▾ BernoulliNB
        BernoulliNB()
```

7. Now let's test the performance of our model on some random sentences based on mental health



```
In [9]: user=input("Enter the text")
        data=cv.transform([user]).toarray()
        output=model.predict(data)
        print(output)

        Enter the texti am very happy
        ['No Stress']
```



```
In [12]: user=input("Enter the text")
         data=cv.transform([user]).toarray()
         output=model.predict(data)
         print(output)

         Enter the texti am feeling lonely
         ['Stress']
```

So as you can see, we can see good results from our machine learning model. This is how you can train a stress detection model to detect stress from social media posts. This machine learning model can be improved by feeding it with more data.