TWITTER SENTIMENT ANALYSIS AND SARCASM DETECTION (USING EMOTICONS)

VIBHU DAGAR - 16BCE2141

SHITIJ GUPTA - 16BCE0510

FACULTY : PROF. SHARMILA BANU

GITHUB LINK FOR THE PROJECT :

https://github.com/vida97/Sentiment-Analysis---Sarcasm-Detection-NLP-Project-

GITHUB LINK FOR TASKS :

https://github.com/vida97/Sentiment-Analysis---Sarcasm-Detection-NLP-Project-/tree/master/class_tasks

RESEARCH PAPER LINK :

https://github.com/ajinkyachavan/Emoticon-Based-Sentiment-Analysis-Python/blob/master/emoticon-based-sentiment-analysis-of-twitter-data.pdf

http://www.cs.columbia.edu/~julia/papers/Agarwaletal11.pdf

https://arxiv.org/ftp/arxiv/papers/1711/1711.10377.pdf

DATASET LINK :

https://raw.githubusercontent.com/ajinkyachavan/Emoticon-Based-Sentiment-Analysis-Python/master/data/final_tweets.csv

POSITIVE AND NEGETIVE WORDS LINK :

https://github.com/ajinkyachavan/Emoticon-Based-Sentiment-Analysis-Python/blob/master/positive-words.txt

https://github.com/ajinkyachavan/Emoticon-Based-Sentiment-Analysis-Python/blob/master/negative-words.txt

FLOW WISE REPRESENTATION OF THE PROJECT :

1. Importing all the libraries :

```
import nltk
import re
import enchant
from textblob import TextBlob
import matplotlib.pyplot as plt
import emoji
import pickle
import os
import sklearn
import numpy as np
```

2. Retrieving data from text files (initiating word lemmatizer) :

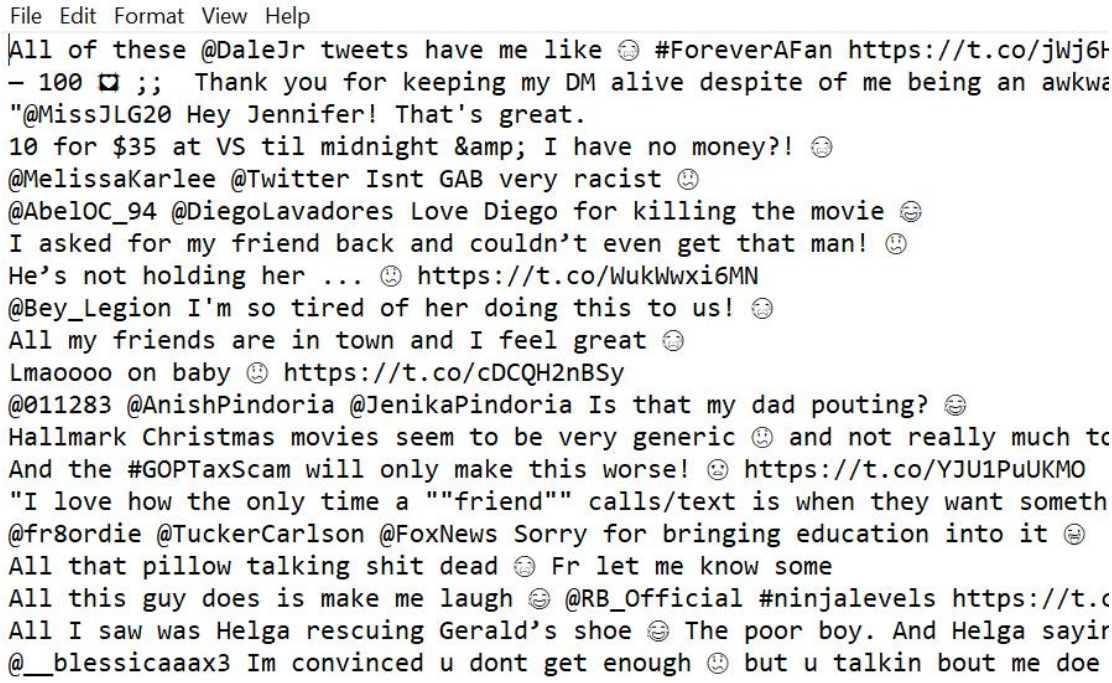
```
lemma = nltk.wordnet.WordNetLemmatizer()
d=enchant.Dict("en_US")
use_stemmer=True

f=open("sample1.txt","r")
x=f.readlines()


positive_file=open("abc.txt","r")
q=positive_file.readlines()
z=[]
for i in q:
    z.append(i[0:-1])


negetive_file=open("def.txt","r")
y=negetive_file.readlines()
m=[]
for i in y:
    m.append(i[0:-1])
```

-- x the data set of all the tweets.



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All of these @DaleJr tweets have me like 😳 #ForeverAFan https://t.co/jWj6H
– 100 🎟 ;; Thank you for keeping my DM alive despite of me being an awkwa
"@MissJLG20 Hey Jennifer! That's great.
10 for $35 at VS til midnight & I have no money?! 😳
@MelissaKarlee @Twitter Isnt GAB very racist 🙁
@AbelOC_94 @DiegoLavadores Love Diego for killing the movie 😂
I asked for my friend back and couldn’t even get that man! 🙁
He’s not holding her ... 🙁 https://t.co/WukWwxi6MN
@Bey_Legion I'm so tired of her doing this to us! 😳
All my friends are in town and I feel great 😳
Lmaoooo on baby 🙁 https://t.co/cDCQH2nBSy
@011283 @AnishPindoria @JenikaPindoria Is that my dad pouting? 😂
Hallmark Christmas movies seem to be very generic 😕 and not really much to
And the #GOPTaxScam will only make this worse! 😟 https://t.co/YJU1PuUKMO
"I love how the only time a ""friend"" calls/text is when they want someth
@fr8ordie @TuckerCarlson @FoxNews Sorry for bringing education into it 😁
All that pillow talking shit dead 😳 Fr let me know some
All this guy does is make me laugh 😂 @RB_Official #ninjalevels https://t.c
All I saw was Helga rescuing Gerald’s shoe 😂 The poor boy. And Helga sayir
@__blessicaaax3 Im convinced u dont get enough 😕 but u talkin bout me doe

-- m has all the negative words and z has all the positive words.

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abound
abounds
abundance
abundant
accessable
accessible
acclaim
acclaimed
acclamation
accolade
accolades
accommodative
accomodative
accomplish
accomplished
accomplishment
accomplishments
accurate
accurately
achievable

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```
2-faced
2-faces
abnormal
abolish
abominable
abominably
abominate
abomination
abort
aborted
aborts
abrade
abrasive
abrupt
abruptly
abscond
absence
absent-minded
absentee
absurd
```

3. Pre-processing the tweets and assigning scores:

```
T_score=[]
T_score1=[]

def pre_tweet(tweet):
    tweet=tweet.lower()
    tweet=re.sub(r'((www\.[\S]+)|(https?://[\S]+))', '', tweet)
    tweet=re.sub(r'@[\S]+', '', tweet)
    tweet1=tweet.split()
    tweet2=TextBlob(tweet)
    t_score=0
    sc=tweet2.sentiment.polarity
    #print(tweet2.tags)
    #print("Score1 : ",sc)
    T_score1.append(sc)
    for words in tweet1:
        if d.check(words)==True:
            word = lemma.lemmatize(words)
            if words in z:
                t_score+=0.5
            if words in m:
                t_score-=0.5
            #print(word,end=' ')
    #print("Score 2 : ",t_score)
    T_score.append(t_score)



l=[]
for i in x[0:1000]:
    l.append(pre_tweet(i))
```

-- Tscore and Tscore1 lists are created to hold the scores of each tweet.
-- Function pre_tweets() is called to perform pre-processing
-- Website links and user mentions are handled.

```
['all', 'of', 'these', '#mention', 'tweets', 'have', 'me', 'like', 'happy', '??'
, '#foreverafan', 'URL']
['—', '100', '??', ';;', 'thank', 'you', 'for', 'keeping', 'my', 'dm', 'alive',
'despite', 'of', 'me', 'being', 'an', 'awkward', 'species', '??', 'lets', 'talk'
, 'more', 'in', 'the', 'future…', 'URL']
['"#mention', 'hey', 'jennifer!', "that's", 'great.']
['10', 'for', '$35', 'at', 'vs', 'til', 'midnight', '&amp;', 'i', 'have', 'no',
'money?!', '??']
['#mention', '#mention', 'isnt', 'gab', 'very', 'racist', '??']
['#mention', '#mention', 'diego', 'for', 'killing', 'the', 'movie', '??']
['i', 'asked', 'for', 'my', 'friend', 'back', 'and', 'couldn’t', 'even', 'get',
'that', 'man!', '??']
['he’s', 'not', 'holding', 'her', '...', '??', 'URL']
['#mention', "i'm", 'so', 'tired', 'of', 'her', 'doing', 'this', 'to', 'us!', '?
?']
['all', 'my', 'friends', 'are', 'in', 'town', '??']
['lmaoooo', 'on', 'baby', '??', 'URL']
```

-- For Tscore, all the words of a tweet are matched to check if they are positive or negative and accordingly scores are assigned to that particular tweet.
-- For Tsocre1 the score retrieved from TextBlob are considered for each tweet.

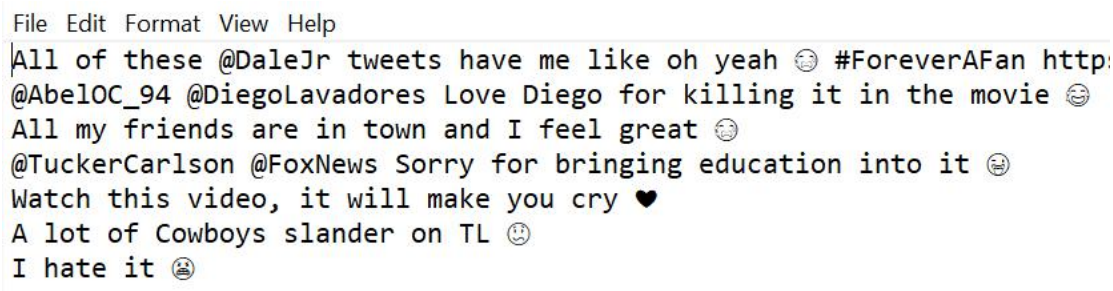
```
[1.0, 0.0, 0, 0, -0.5, -0.5, 0, 0, -0.5, 0, 0, 0, 1.0, 0, 0.5
0, 0.5, 0.5, 0, 0, 0.5, 0, 0, 0, 1.0, 0.5, 0, 0, -0.5, 0, 0,
5, 0, 0.0, 0, -0.5, 0.5, 0, 0, 0, 0, 0.0, 0, 0, -0.5, -1.0, (
-0.5, 0.5, 0, 0.5, 0, 0.5, 0, -0.5, 0.5, 0, 0, 0, 0, 0, 0, -(
.0, -0.5, 1.0, 1.0, 0, -0.5, 0.5, 0, -1.0, -0.5, 0, 0, 0, -0.
.0, 0, -0.5, -0.5, 0, 0.5]
[0.8, 0.0, 0.8, 0.0, 0.2, 0.0, 0.0, 0.0, -0.5, 0.0, 0.0, 0.0,
3, -0.25, 0.25, -0.5, -0.2, 0.3, 0.2333333333333333, 0.0, 0.4
.0, 0.075, 0.5, -0.8, 0.0, 0.0, 0.39999999999999997, 0.4, 0.9
0, 0.8, 0.0, 0.0, 0.0, 0.17142857142857143, 0.0, 0.0, 0.0, 0.
.5, 0.5, 0.0, 0.0, 0.06666666666666667, -0.5, 0.0, 0.0, -0.5,
, -0.2, 0.0, -0.3, 0.0, -0.5, 0.4, 0.0, 0.0, 0.0, 0.0, 0.1072
, -0.05, -0.17708333333333334, 0.0, 0.0, 0.25, 0.0, -0.316666
0000000000044, 0.2, 0.0, 0.06818181818181818, 0.0, 0.1875, 0.
0.0, -0.5, 0.06190476190476191, 0.0, -0.25, -0.03333333333333
, -0.4, -0.3125, 0.0, 0.22348484848484848, 0.0, 0.0, 0.0, 0.0
34, 0.0, 0.2]
```

4. Handling emoticons :

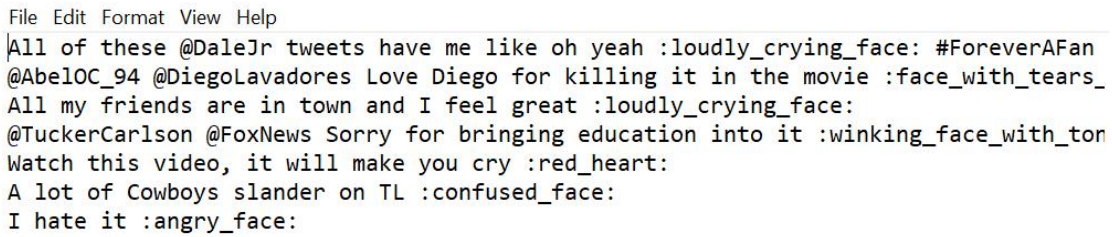
```
def preprocessing():
    with open('emoji.txt', 'r', encoding='utf16', errors='ignore') as file:
        text = file.read().split('\n')
    for i in range(len(text)):
        text[i] = emoji.demojize(text[i])
    with open('final_tweets.txt', 'w+', encoding='utf8', errors='ignore') as fil
        new_text = ""
        for i in range(len(text)):
            new_text += text[i] + "\n"
        file.write(new_text)

preprocessing()
```

-- Opening the file containing emoticons and the demojizing all the emojis found using emoji.demojize(text[])
-- Saving the tweets with handled emoticons in the file final_tweets

Before emoticons are handled :



After emoticons are handled :



5. Calculating the scores and visual representation of the scores :

```
print(T_score)
print(T_score1)
p,q,n=0,0,0
for i in T_score:
    if i>0:
        p+=1
    if i<0:
        q+=1
    if i==0:
        n+=1
ts1=[p,q,n]
labels=["positive","negetive","neutral"]
colors=["green","red","blue"]
patches, texts = plt.pie(ts1, colors=colors, shadow=True, startangle=90)
plt.legend(patches, labels, loc="best")
plt.axis('equal')
plt.tight_layout()
plt.show()
```

```
p,q,n=0,0,0
for i in T_score1:
    if i>0:
        p+=1
    if i<0:
        q+=1
    if i==0:
        n+=1
ts2=[p,q,n]
labels=["positive","negetive","neutral"]
colors=["green","red","blue"]
patches, texts = plt.pie(ts2, colors=colors, shadow=True, startangle=90)
plt.legend(patches, labels, loc="best")
plt.axis('equal')
plt.tight_layout()
plt.show()
print("\n")
print("Percentages Score 1 :")
print("  Positive : ",ts1[0]/(ts1[0]+ts1[1]+ts1[2])*100)
print("  Negetive : ",ts1[1]/(ts1[0]+ts1[1]+ts1[2])*100)
print("  Neutral : ",round(ts1[2]/(ts1[0]+ts1[1]+ts1[2])*100,2))
print("Percentages Score 2 : (TextBlob)")
print("  Positive : ",ts2[0]/(ts2[0]+ts2[1]+ts2[2])*100)
print("  Negetive : ",ts2[1]/(ts2[0]+ts2[1]+ts2[2])*100)
print("  Neutral : ",ts2[2]/(ts2[0]+ts2[1]+ts2[2])*100)
print("\n")
```

-- Calculating the percentages of positive, negative or neutral tweets for both the cases.

-- Visualizing the polarities using pie charts.

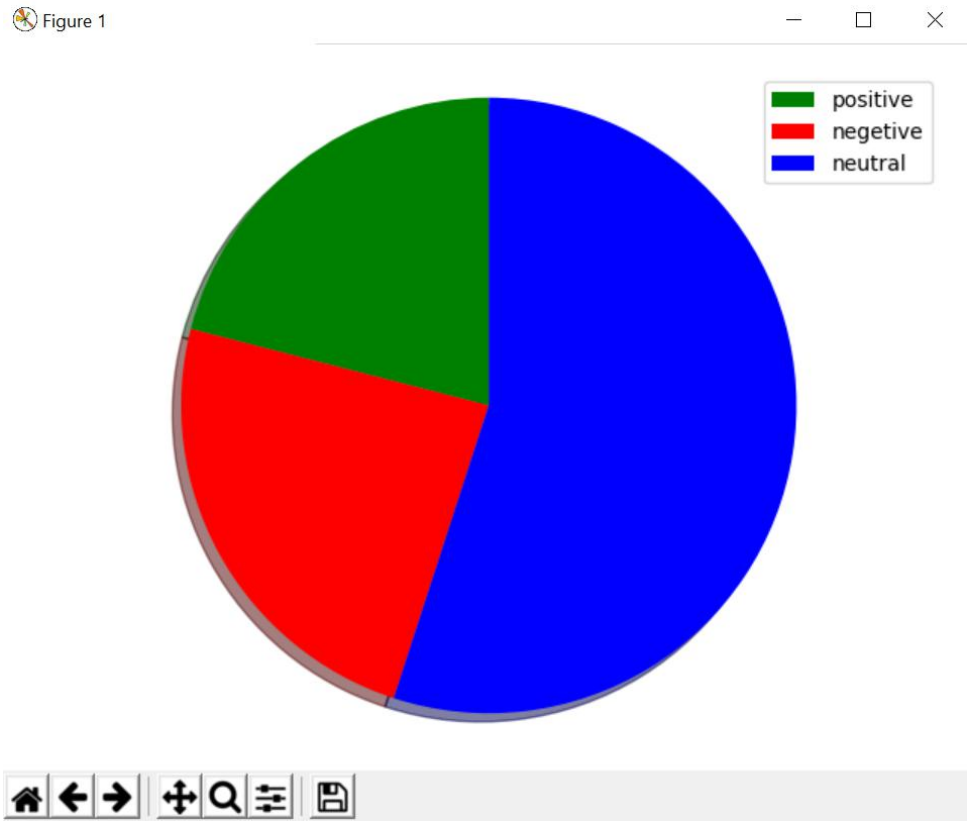


Figure 1
positive
negetive
neutral

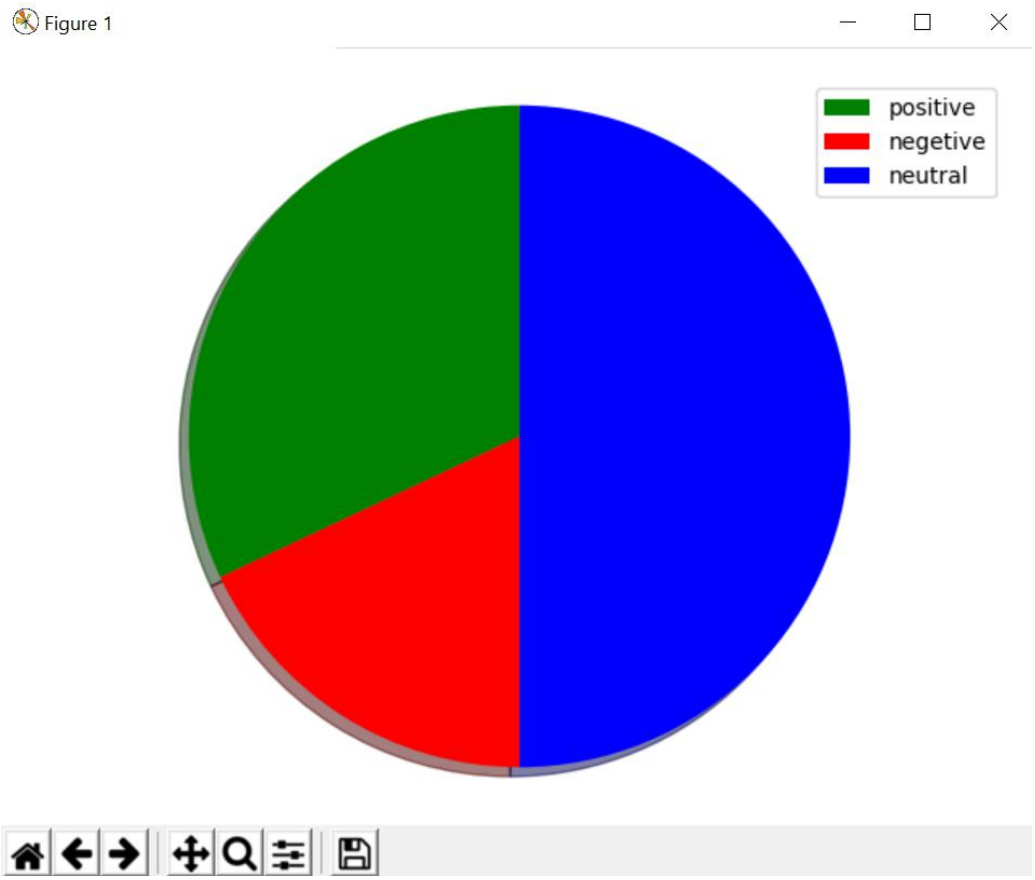


Figure 1
positive
negetive
neutral

6. Scoring the emoticons and text :

```
f=open('final_tweets.txt','r')
zz=f.readlines()
score_emo=0
ZZ=[]
for i in zz:
    ZZ.append(i[0:-1])
sc1=[]
sc2=[]
for i in ZZ:
    score_emo=0
    twe=TextBlob(i)
    dc=twe.sentiment.polarity
    sc1.append(dc*0.1)
    zzz=[]
    zzz=i.split(" ")
    for i in zzz:
        if i==":loudly_crying_face:":
            score_emo+=-0.093
        if i==":face_with_tears_of_joy:":
            score_emo+=0.221
        if i==":winking_face_with_tongue:":
            score_emo+=0.445
        if i==":confused_face:":
            score_emo+=0.001
        if i==":red_heart:":
            score_emo+=0.746
        if i==":angry_face:":
            score_emo+=-0.397
    sc2.append(score_emo)
print(sc1)
print(sc2)
```

-- Emoticons are given scores based on the research already done.
-- Their score hold more weightage than that of text present in the tweets.
-- Text in the tweets are scored through TextBlob Library.

7. Recognizing sarcasm :

```
fsc=[]
for i in range(len(sc1)):
    fsc.append(sc1[i]+sc2[i])
#print(fsc)
SC1=np.sign(sc1)
SC2=np.sign(sc2)
SC=[]
Sc=[]
for i in range(len(sc1)):
    if SC1[i]==SC2[i]:
        SC.append(SC1[i])
        Sc.append("no")
    else:
        SC.append(SC2[i])
        Sc.append("yes")
print(SC)
print(Sc)
```

-- The scores of the emoticons and text in the tweets are taken into consideration together hence generating the final score.
-- Also to identify the sarcasm in the statements/tweets the polarity of text is matched with that of the tweets.

```
[0.0, 0.05, 0.08000000000000002, -0.05, 0.0, 0.0, -0.08000000000000002]
[-0.093, 0.221, -0.093, 0.445, 0.746, 0.001, -0.397]
[-1.0, 1.0, -1.0, 1.0, 1.0, 1.0, -1.0]
['yes', 'no', 'yes', 'yes', 'yes', 'yes', 'no']
```