Phrase Emotion Detector

A

PROJECT REPORT

Submitted in partial fulfillment of the requirements for the award of the degree of

BACHELOR OF TECHNOLOGY IN

COMPUTER SCIENCE & ENGINEERING

Under the supervision

of

Dr. Jagpreet Sidhu

(Assistant Professor (Senior Grade) -Department of (CSE and IT)

by

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INDIA

JUNE-2020

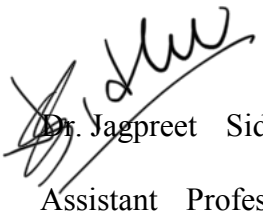
Candidate's Declaration

I thus pronounce that the work introduced in this report entitled "**Phrase Emotion Detector**" in partial fulfillment of the necessities for the honor of the level of **Bachelor of Technology** in **Computer Science and Engineering** submitted in the branch of **Computer Science and Engineering and Information Technology, Jaypee University of Information Technology Waknaghat** is our very own valid record work completed over a period from May 2020 to June 2020 under the oversight of **Dr. Jagpreet Sidhu** (Assistant Professor (Senior Grade) Department of Computer Science and Engineering and InformationTechnology -JUIT) .

The matter exemplified in the report has not been submitted for the honor of some other degree or confirmation .

Aayushman Saraswat, 161324

This is to certify that the above statement made by the candidate is true to the best of my knowledge .



Dr. Jagpreet Sidhu

Assistant Professor (Senior Grade)

Department of Computer Science & Engineering

Dated :

Acknowledgment

The fulfillment that goes with the effective finishing of any errand would be deficient without the notice of the individuals whose unending participation made it conceivable , whose consistent direction and consolation crown all endeavors with progress. I am appreciative to my venture control **Dr. Jagpreet Sidhu** for direction, motivation and productive recommendations that helped me in the readiness of the undertaking.

I likewise thank my associates who have helped me in fruitful fulfillment of the task.

Aayushman Saraswat

Project Report Undertaking

I Mr.Aayushman Saraswat Roll No.: 161324 Branch: Computer Science is doing my internship with Infosys Limited from Feburary 24, 2020 to March 19, 2020.

As per procedure I have to submit my project report to the university related to my work that I have done during this internship.

I have compiled my project report. But due to COVID-19 situation my project mentor in the company is not able to sign my project report.

So I hereby declare that the project report is fully designed/developed by me and no part of the work is borrowed or purchased from any agency. And I'll produce a certificate/document of my internship completion with the company to TnP Cell whenever COVID-19 situation gets normal.

Signature_____

Name Aayushman Saraswat

Date _____

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Abstract

The title of the project is **“Phrase Emotion Detector”.**

As the name indicates the main motive of the project was to predict the tone of the block of text/essay/book chapter. This is an extrapolation of the popularly used “Sentiment Analysis Tool” to determine the tone of the author in his literary works/social media/ essay writing competitions etc. The complete project has been discussed in the upcoming sections.

This algorithm uses linguistic analysis to detect emotional and language tones in written text. The service can analyze tone at both the document and sentence levels. You can use the service to understand how your written communications are perceived and then to improve the tone of your communications . Businesses can use the service to learn the tone of their customers' communications and to respond appropriately to each customer, or to understand and improve their customer conversations in general.

Chapter – 1

INTRODUCTION

1.1 Introduction

Essentially, sentiment analysis or sentiment classification fall within the broad category of text classification tasks where you are given a phrase or a list of phrases, and your classifier will tell you whether the feeling behind it is positive , negative or neutral. Sometimes the third attribute is not used to hold the question of binary classification.
As emotional analysis has developed over the last few decades, so have its implementations. Sentimental research is now being used from the precise promotion of goods to the detection of anti-social behaviour. Millions of messages appear every day on popular websites offering microblogging services.
Writers of these messages write about their lives, express opinions on a number of subjects , and address current issues.
For example, we may be interested in an individual's questions :
What do people think about this persons status post(comments) ?

How positive (or negative) are people about it ?

Since emotion detection is the newer area of textual analysis , it has a weaker standard methods. Emotion can be expressed as happiness , sadness , anger , disgust , fear , surprise and so forth.

1.2 Problem Statement

As mentioned earlier, huge amount of data is available over the web whatsapp , twitter, blogs and many more. Analyzing this could be beneficial in predicting the next response on given extracted data.

This could be beneficial over the following areas:

- **Business:** Marketing firms use it to build their tactics, to consider how customers feel about goods or brands, how people react to their promotions or product releases, and why consumers do not purchase products.
- **Politics:** It is used in the political field to keep track of political opinions, to identify continuity and inconsistency between claims and behavior at the level of government.
- **Public Actions:** Sentiment analysis is also used to monitor and analyze social phenomena, to detect potentially dangerous situations and to determine the general mood of the blogosphere.

1.2 Objective

The main aim of the project is to develop a system which is able to detect or tell about the tone or the emotion of the essay or the phrase. The project is designed to fulfill following feature as listed below:

- To detect the tone of the essay.
- To extract the features needed by the code or the algorithm from the essay.
- To classify the feature as needed to detect the tone or the emotion of the passage.

1.3 Scope of the Project

We will design a system a system which will compromise of two modules. The first one will help us to clean the data using various techniques such as tokenization ,stemming , removing stop words in order even the data. The second model comprises of the algorithm written using machine learning that will help in detecting the emotion of the phrase or essay written as input to the program.

CHAPTER 2

LITERATURE REVIEW

2.1 Limitations to Prior

Right off the bat, information is preprocessed , in it at first all content are changed over into lowercase words for straightforwardness of highlight extraction . At that point the words finishing with apostrophizes are changed over back to unique structure like don't - > don't, any non ASCII character is evacuated. This is trailed by expulsion of stop words (eg. an, a, the) as they don't pass on any component so expulsion of stop words is liked. Second arrangement includes apportioning information into preparing and test information. For preparing information subsequent to performing stemming (removing additions like ing eg. : figuring >compute) include choice is to be acted in which different measurable techniques are applied to check whether supposition of survey can be extricated from the include of words in each example

2.2 Related Work

Sentiment analysis models focus on polarity (positive, negative, neutral) but also on feelings and emotions (angry , happy , sad, etc.) and even on intentions (e.g. not interested).

Here are some of the most common kinds of sentiment analysis :

- **Fine-grained Sentiment Analysis**

  If polarity accuracy is important to your business , you can consider expanding your polarity categories to include :

  i) Very positive
  ii) Positive
  iii) Neutral
  iv) Negative
  v) Very negative

- **Emotion detection**

  This sort of sentiment analysis targets identifying feelings, similar to satisfaction, happiness, frustration, anger, sadness, and so on. Numerous feeling identification frameworks use dictionaries (for example arrangements of words and the feelings they pass on) or complex AI calculations. One of the drawb acks of utilizing dictionaries is that individuals express feelings in various manners. A few words that regularly express indignation, similar to awful or murder (for example your item is so terrible or your client care is murdering me) may likewise communicate bliss (for example this is boss or you are murdering it).

- **Aspect-based Sentiment Analysis**

  Usually , when analyzing the feelings of the texts , let's say the product reviews, you'll want to know which particular aspects or features people mention in a positive , neutral or negative way . This is where aspect-based sentiment analysis can help, for example in this text :" The battery life of this camera is too short , "an aspect-based classifier would be able to determine that the sentence expresses a negative opinion on the battery life feature.

- **Multilingual sentiment analysis**

  Multilingual sentiment analysis can be troublesome. It includes a great deal of preprocessing and assets. The majority of these assets are accessible on the web (for example sentiment vocabularies) , while others should be made (for example interpreted corpora or noise detection algorithms).

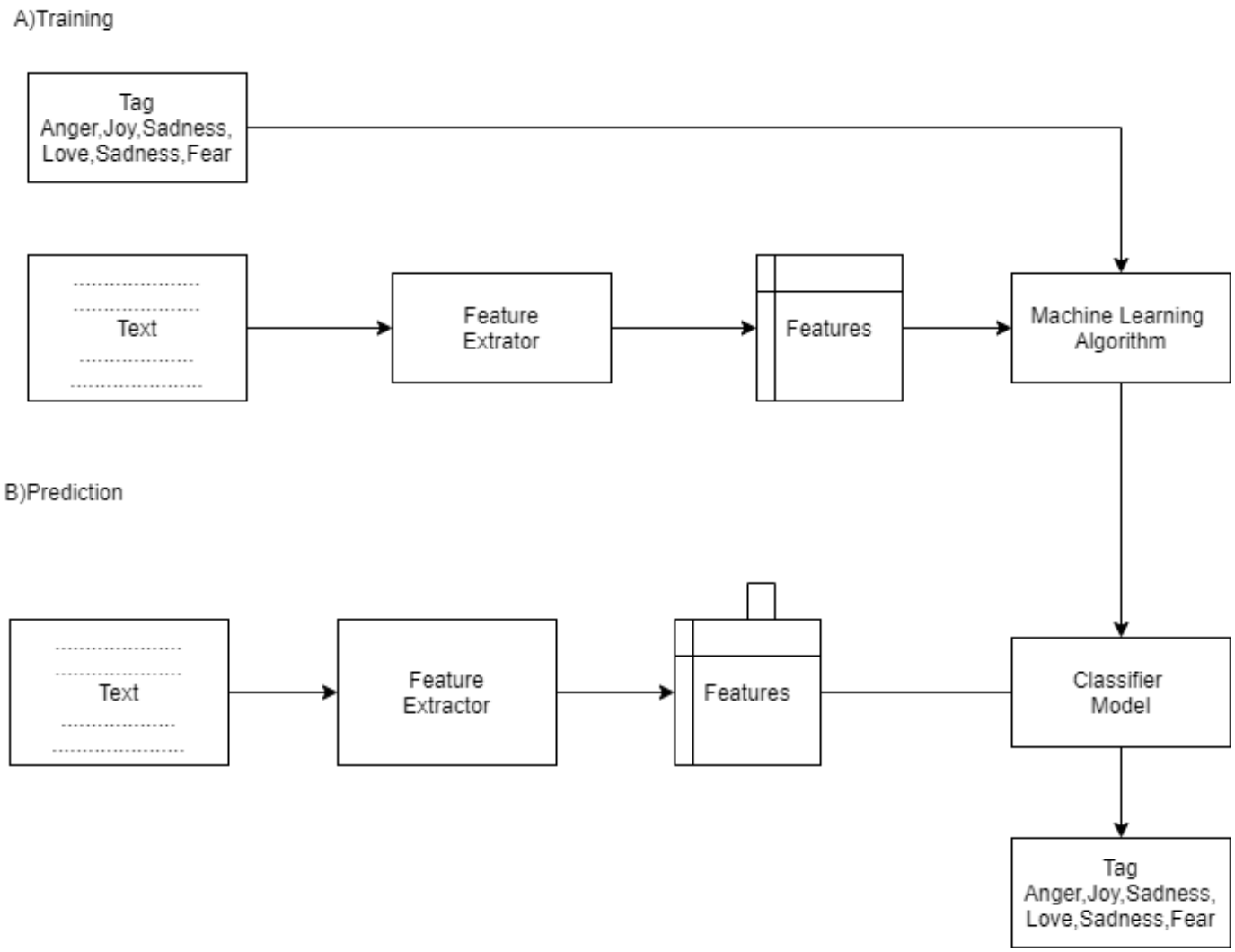


Fig 1: Work flow of Algorithm

CHAPTER 3
SYSTEM DEVELOPMENT

3.1 Introduction

The tool developed as a part of this training programme enables a user to upload a text file and predicts the tone of the uploaded text with about 85% accuracy. The model trains at 50,000 random sentences out of the .. sentences in the dataset obtained from Kaggle. The algorithm used to predict the emotion of the sentences in the input file is Logical Regression. After successfully determining the emotion of each sentence, the tool returns the most frequently occurring emotion in all the sentences. It also computes a pie chart depicting the relative distribution of other emotions in the input file.

3.2 System Development

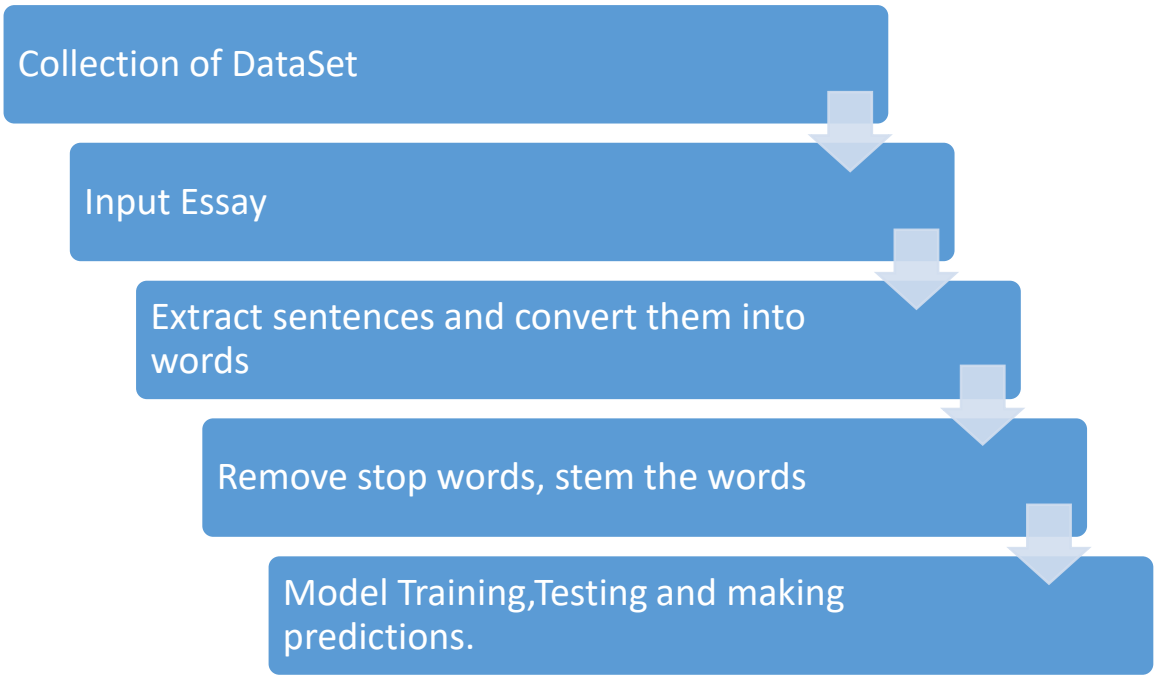


Fig 2: Model Implementation

3.3 Software Used

This system is build with the help of number of tools which provide us platform to run our algorithms or store data or the functions for the front end services some of the main tools are as follows:

- **NLTK(Natural Language Toolkit)**

Natural Language Processing is the manipulation or comprehension of text or speech by any software or machine . The analogy is that humans interact,understand each other's views, and respond to each other with an appropriate response. In the NLP, this interaction, understanding, isdone by a computer instead of a human.

NLTK stands for NaturalLanguage Toolkit . This toolkit is one of the most powerful NLP libraries that contains packages to make machines understand human language and respond to it with an appropriate response. Tokenization, Stemming , Lemmatization , Punctuation, Character count, word count etc.

Various NLP Libraries

NLP Library	Description
NLTK	It's one of the most usable and mother of all NLP libraries .
spaCy	This is a completely designed and highly effective library commonly used in deep learning.
Stanford CoreNLP Python	This is a good NLTK library for client-server-based architecture. This is written in JAVA, but it provides the modularity to use in Python.
TextBlob	This is an NLP library that works in Pyhton2 and Python3. This is used for theprocessing of text data and provides, in particular , all type of operation in the form of an API.
Gensim	Genism is a robust open source support for the Python NLP library . This library is very powerful and scalable.
Pattern	It's a lightweight NLP board. This is generally used in web-mining, crawling, or spidering tasks of this kind.
Polyglot	Polyglot is the best suited NLP library for massive multilingual applications. Function extraction in the direction of Identity and Object.
PyNLPl	PyNLPI was previously known as 'Pineapple' and supportsPython. It offers a parser for a variety of data formats, such as FoLiA / Giza / Moses / ARPA / Timbl / CQL.
Vocabulary	This library is ideally suited to get information on the semantic type from the text in question.

- **Microsoft Excel**

The standard feature of MS Excel is that it contains diverse logical limits that can help us in calculations and there are piece of instruments that can be used to plot diagrams in different structures that urges us to separate data and various instruments , for instance turn tables ,programming language named Visual stray pieces for various applications.Spreadsheets will provide you with the characteristics arranged in rows and columns that can be changed deductively using both basic and complex number shuffling exercises.

3.4 Preprocessing Data

Cleaning of the data that we are going to use is very important to highlight the important points that are necessary for our machine learning framework to pick . This include various steps:

1. **Eliminate Punctuation :**

One way to do this is by looping through the list comprehension series and keeping everything that isn't in a string . Punctuation , a list of all the punctuation that we imported at the beginning with the import string.

```
In [7]:
import string
string.punctuation

Out[7]: '!"#$%&\'()*+,-./:;<=>?@[\\]^_`{|}~'

In [8]:
#function to remove Punctuation
def remove_punct(text):
    text_nopunct = "".join([char for char in text if char not in string.pun
    return text_nopunct

data['body_text_clean'] = data['body_text'].apply(lambda x: remove_punct(x)

data.head()
```

Out[8]:

	label	body_text	body_text_clean
0	ham	I've been searching for the right words to tha...	Ive been searching for the right words to than...
1	spam	Free entry in 2 a wkly comp to win FA Cup fina...	Free entry in 2 a wkly comp to win FA Cup fina...
2	ham	Nah I don't think he goes to usf, he lives aro...	Nah I dont think he goes to usf he lives aroun...
3	ham	Even my brother is not like to speak with me. ...	Even my brother is not like to speak with me T...
4	ham	I HAVE A DATE ON SUNDAY WITH WILL!!	I HAVE A DATE ON SUNDAY WITH WILL

Fig 3.1: Eliminate Punctuation

2. Tokenization:

This breaks the strings into a list of words or pieces based on a specified pattern using Regular Expressions aka RegEx. The pattern I have chosen to use this time (r'\w') also eliminates punctuation and is a better choice for this data in particular. We can also add.lower() to the lambda function to make everything smaller.

```
In [9]:
import re

# Function to tokenize words
def tokenize(text):
    tokens = re.split('\W+', text) #W+ means that either a word character (A-Za-z0-9_) or a dash (-) can go there.
    return tokens

data['body_text_tokenized'] = data['body_text_clean'].apply(lambda x: tokenize(x.lower()))
#We convert to Lower as Python is case-sensitive.

data.head()
```

Out[9]:

	label	body_text	body_text_clean	body_text_tokenized
0	ham	I've been searching for the right words to tha...	I've been searching for the right words to than...	[i've, been, searching, for, the, right, words,...
1	spam	Free entry in 2 a wkly comp to win FA Cup fina...	Free entry in 2 a wkly comp to win FA Cup fina...	[free, entry, in, 2, a, wkly, comp, to, win, f...
2	ham	Nah I don't think he goes to usf, he lives aro...	Nah I don't think he goes to usf he lives aroun...	[nah, i, don't, think, he, goes, to, usf, he, l...
3	ham	Even my brother is not like to speak with me. ...	Even my brother is not like to speak with me T...	[even, my, brother, is, not, like, to, speak, ...
4	ham	I HAVE A DATE ON SUNDAY WITH WILL!!	I HAVE A DATE ON SUNDAY WITH WILL	[i, have, a, date, on, sunday, with, will]

Fig3.2: Tokenization

3. Stop Words:

We imported a list of the most frequently used words from the NL Toolkit at the beginning with `from nltk.corpus import stopwords`. You can run `stopwords.word(insert language)` to get a full list for every language. There are 179 English words, including 'i', 'me', 'my', 'myself', 'we', 'you', 'he', 'his', for example. We usually want to remove these because they have low predictive power.

```
In [10]:
import nltk

stopword = nltk.corpus.stopwords.words('english')# All English Stopwords

In [11]:
# Function to remove stopwords
def remove_stopwords(tokenized_list):
    text = [word for word in tokenized_list if word not in stopword]# To remove all stopwords
    return text

data['body_text_nostop'] = data['body_text_tokenized'].apply(lambda x: remove_stopwords(x))

data.head()
```

Out[11]:

	label	body_text	body_text_clean	body_text_tokenized	body_text_nostop
0	ham	I've been searching for the right words to tha...	I've been searching for the right words to than...	[i've, been, searching, for, the, right, words,...	[i've, searching, right, words, thank, breather...
1	spam	Free entry in 2 a wkly comp to win FA Cup fina...	Free entry in 2 a wkly comp to win FA Cup fina...	[free, entry, in, 2, a, wkly, comp, to, win, f...	[free, entry, 2, wkly, comp, win, fa, cup, fin...
2	ham	Nah I don't think he goes to usf, he lives aro...	Nah I don't think he goes to usf he lives aroun...	[nah, i, don't, think, he, goes, to, usf, he, l...	[nah, don't, think, goes, usf, lives, around, t...
3	ham	Even my brother is not like to speak with me. ...	Even my brother is not like to speak with me T...	[even, my, brother, is, not, like, to, speak, ...	[even, brother, like, speak, treat, like, aids...
4	ham	I HAVE A DATE ON SUNDAY WITH WILL!!	I HAVE A DATE ON SUNDAY WITH WILL	[i, have, a, date, on, sunday, with, will]	[date, sunday]

Fig3.3: Remove Stop Words

4. Stemming:

Stemming is a little more violent. It breaks down prefixes and/ or ends of words based on specific ones. It can be helpful sometimes, but not always because often the new word is so rooted that it loses its actual meaning.

```
In [12]: ps = nltk.PorterStemmer()

def stemming(tokenized_text):
    text = [ps.stem(word) for word in tokenized_text]
    return text

data['body_text_stemmed'] = data['body_text_nostop'].apply(lambda x: stemming(x))

data.head()
```

Out[12]:

	label	body_text	body_text_clean	body_text_tokenized	body_text_nostop	body_text_stemmed
0	ham	I've been searching for the right words to tha...	Ive been searching for the right words to thank...	[Ive, been, searching, for, the, right, words,...	[Ive, searching, right, words, thank, breather...	[Ive, search, right, word, thank, breather, pr...
1	spam	Free entry in 2 a wkly comp to win FA Cup fina...	Free entry in 2 a wkly comp to win FA Cup fina...	[Free, entry, in, 2, a, wkly, comp, to, win, F...	[Free, entry, 2, wkly, comp, win, FA, cup, fir...	[free, entri, 2, wkli, comp, win, fa, cup, fir...
2	ham	Nah I don't think he goes to usf, he lives aro...	Nah I dont think he goes to usf he lives aroun...	[Nah, I, dont, think, he, goes, to, usf, he, l...	[Nah, dont, think, goes, usf, lives, around, t...	[nah, dont, think, goe, usf, live, around, tho...
3	ham	Even my brother is not like to speak with me. ...	Even my brother is not like to speak with me T...	[Even, my, brother, is, not, like, to, speak, ...	[even, brother, like, speak, treat, like, dirt...	[even, brother, like, speak, treat, like, dirt...
4	ham	I HAVE A DATE ON SUNDAY WITH WILL!!	I HAVE A DATE ON SUNDAY WITH WILL	[I, have, a, date, on, sunday, with, will]	[date, sunday]	[date, sunday]

Fig3.4: Stemming

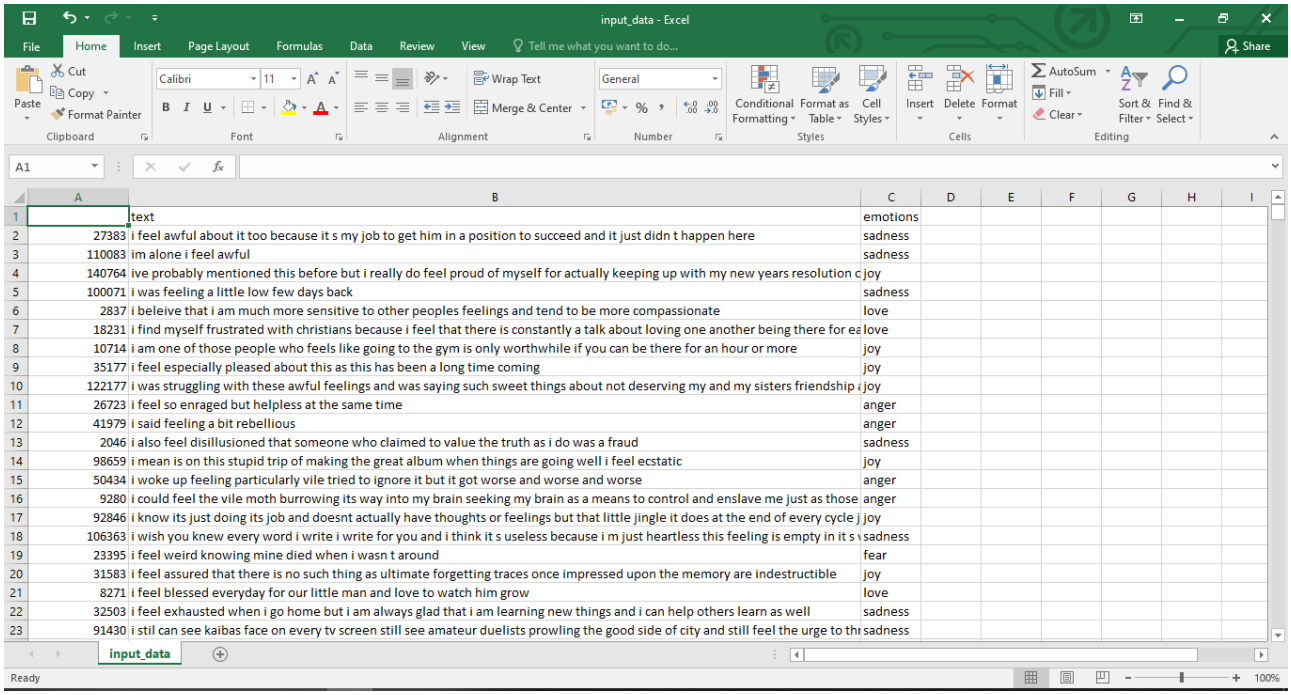
CHAPTER 4
CODE IMPLEMENTATION

This module contains different code for various functioning of the project and also the outputs figures captured in running environment.

4.1 Dataset

The dataset consists of 4,16,809 sentences with labelled emotion.

The data was collected from Kaggle. The snapshot of the dataset is:

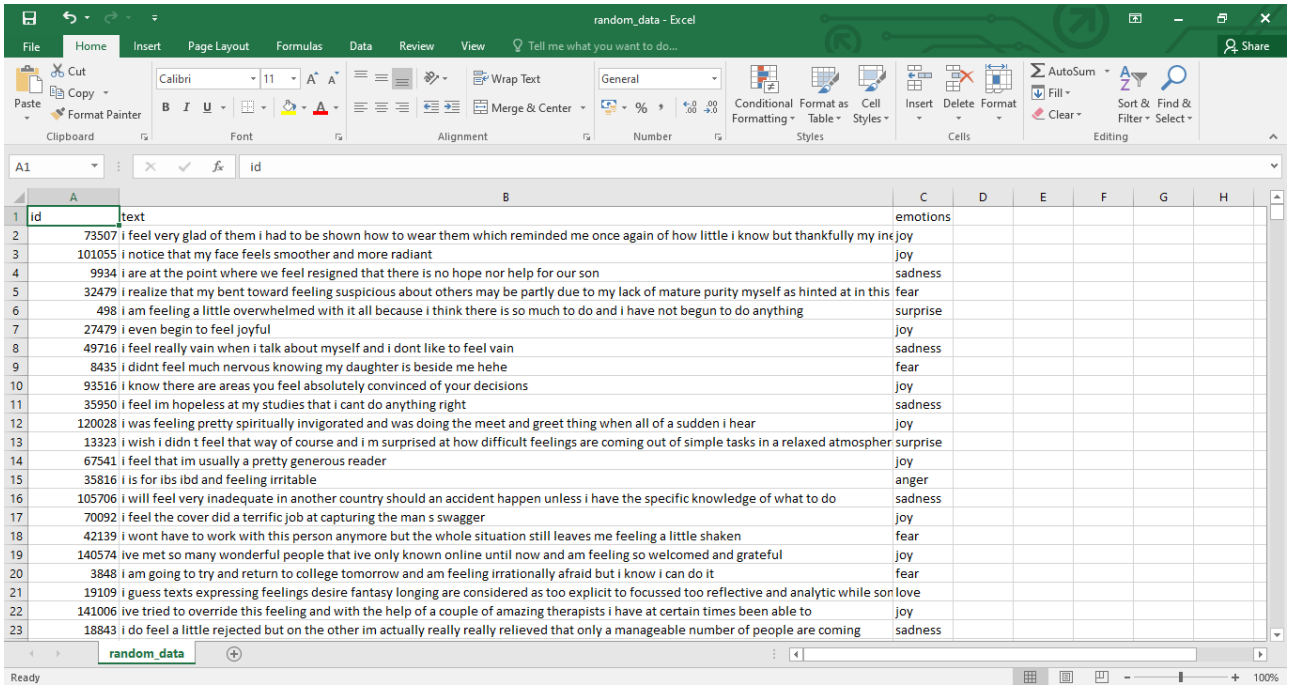


	A	B	C
1		text	emotions
2	27383	i feel awful about it too because it s my job to get him in a position to succeed and it just didn t happen here	sadness
3	110083	im alone i feel awful	sadness
4	140764	ive probably mentioned this before but i really do feel proud of myself for actually keeping up with my new years resolution c	joy
5	100071	i was feeling a little low few days back	sadness
6	2837	i beleive that i am much more sensitive to other peoples feelings and tend to be more compassionate	love
7	18231	i find myself frustrated with christians because i feel that there is constantly a talk about loving one another being there for ea	love
8	10714	i am one of those people who feels like going to the gym is only worthwhile if you can be there for an hour or more	joy
9	35177	i feel especially pleased about this as this has been a long time coming	joy
10	122177	i was struggling with these awful feelings and was saying such sweet things about not deserving my and my sisters friendship a	joy
11	26723	i feel so enraged but helpless at the same time	anger
12	41979	i said feeling a bit rebellious	anger
13	2046	i also feel disillusioned that someone who claimed to value the truth as i do was a fraud	sadness
14	98659	i mean is on this stupid trip of making the great album when things are going well i feel ecstatic	joy
15	50434	i woke up feeling particularly vile tried to ignore it but it got worse and worse and worse	anger
16	9280	i could feel the vile moth burrowing its way into my brain seeking my brain as a means to control and enslave me just as those	anger
17	92846	i know its just doing its job and doesnt actually have thoughts or feelings but that little jingle it does at the end of every cycle j	joy
18	106363	i wish you knew every word i write i write for you and i think it s useless because i m just heartless this feeling is empty in it s s	sadness
19	23395	i feel weird knowing mine died when i wasn t around	fear
20	31583	i feel assured that there is no such thing as ultimate forgetting traces once impressed upon the memory are indestructible	joy
21	8271	i feel blessed everyday for our little man and love to watch him grow	love
22	32503	i feel exhausted when i go home but i am always glad that i am learning new things and i can help others learn as well	sadness
23	91430	i stil can see kaibas face on every tv screen still see amateur duelists prowling the good side of city and still feel the urge to thr	sadness

Fig4.1: Input Data Set

The dataset is obtained from Kaggle.Our Module learns on this dataset.The tool learns on 50,000

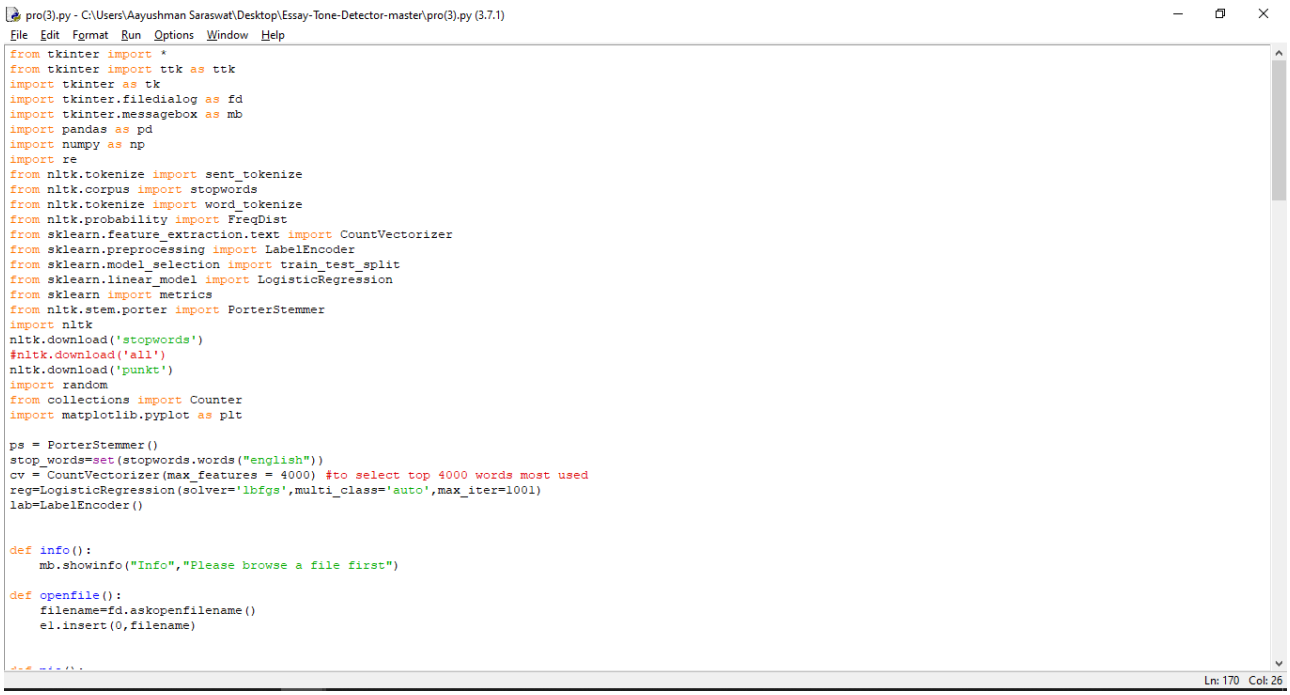
Randomly picked sentences out of whole dataset.This data is then transformed into matrix and our model is then trained on this data. This algorithm uses logical regression.



	id	text	emotions
2	73507	i feel very glad of them i had to be shown how to wear them which reminded me once again of how little i know but thankfully my in	joy
3	101055	i notice that my face feels smoother and more radiant	joy
4	9934	i are at the point where we feel resigned that there is no hope nor help for our son	sadness
5	32479	i realize that my bent toward feeling suspicious about others may be partly due to my lack of mature purity myself as hinted at in this	fear
6	498	i am feeling a little overwhelmed with it all because i think there is so much to do and i have not begun to do anything	surprise
7	27479	i even begin to feel joyful	joy
8	49716	i feel really vain when i talk about myself and i dont like to feel vain	sadness
9	8435	i didnt feel much nervous knowing my daughter is beside me hehe	fear
10	93516	i know there are areas you feel absolutely convinced of your decisions	joy
11	35950	i feel im hopeless at my studies that i cant do anything right	sadness
12	120028	i was feeling pretty spiritually invigorated and was doing the meet and greet thing when all of a sudden i hear	joy
13	13323	i wish i didn t feel that way of course and i m surprised at how difficult feelings are coming out of simple tasks in a relaxed atmospher	surprise
14	67541	i feel that im usually a pretty generous reader	joy
15	35816	i is for ibs ibd and feeling irritable	anger
16	105706	i will feel very inadequate in another country should an accident happen unless i have the specific knowledge of what to do	sadness
17	70092	i feel the cover did a terrific job at capturing the man s swagger	joy
18	42139	i wont have to work with this person anymore but the whole situation still leaves me feeling a little shaken	fear
19	140574	ive met so many wonderful people that ive only known online until now and am feeling so welcomed and grateful	joy
20	3848	i am going to try and return to college tomorrow and am feeling irrationally afraid but i know i can do it	fear
21	19109	i guess texts expressing feelings desire fantasy longing are considered as too explicit to focussed too reflective and analytic while son	love
22	141006	ive tried to override this feeling and with the help of a couple of amazing therapists i have at certain times been able to	joy
23	18843	i do feel a little rejected but on the other im actually really really relieved that only a manageable number of people are coming	sadness

Fig4.2: Random Training Data Set

4.2 Code



```
from tkinter import *
from tkinter import ttk as ttk
import tkinter as tk
import tkinter.filedialog as fd
import tkinter.messagebox as mb
import pandas as pd
import numpy as np
import re
from nltk.tokenize import sent_tokenize
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
from nltk.probability import FreqDist
from sklearn.feature_extraction.text import CountVectorizer
from sklearn.preprocessing import LabelEncoder
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
from sklearn import metrics
from nltk.stem.porter import PorterStemmer
import nltk
nltk.download('stopwords')
#nltk.download('all')
nltk.download('punkt')
import random
from collections import Counter
import matplotlib.pyplot as plt

ps = PorterStemmer()
stop_words=set(stopwords.words("english"))
cv = CountVectorizer(max_features = 4000) #to select top 4000 words most used
reg=LogisticRegression(solver='lbfgs',multi_class='auto',max_iter=1001)
lab=LabelEncoder()


def info():
    mb.showinfo("Info","Please browse a file first")

def openfile():
    filename=fd.askopenfilename()
    e1.insert(0,filename)
```

Fig5.1: Code

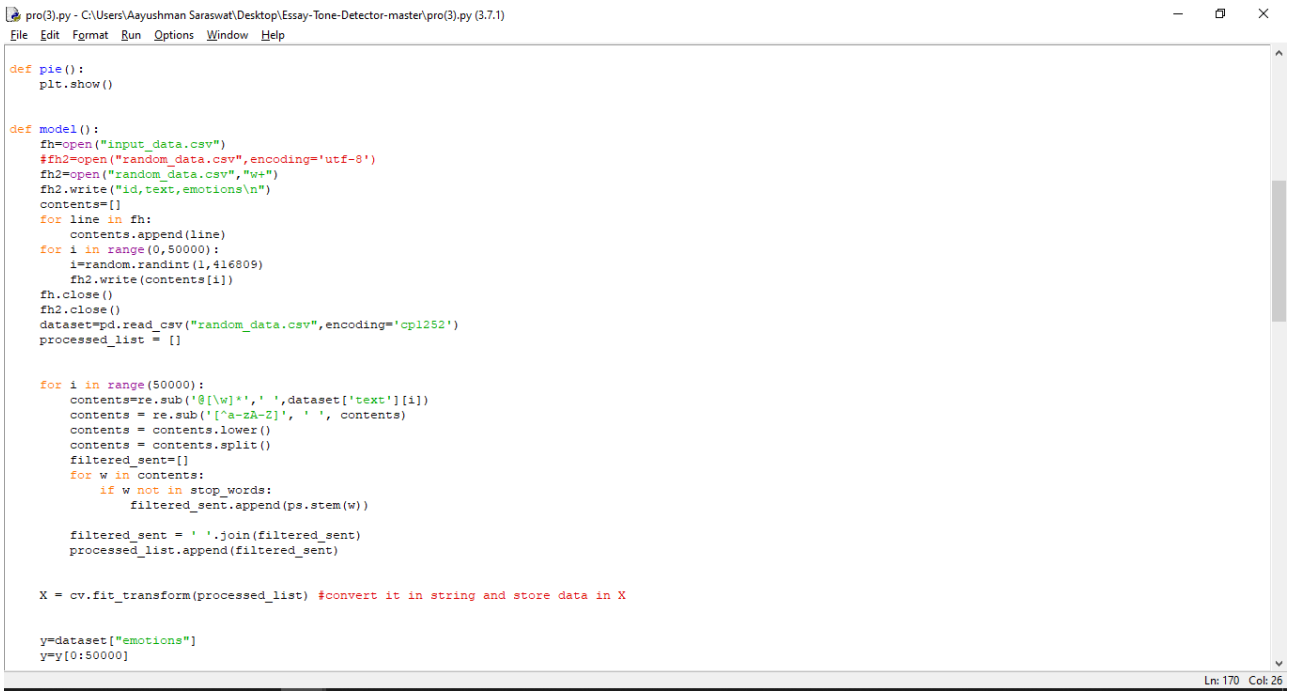


Fig5.2: Code

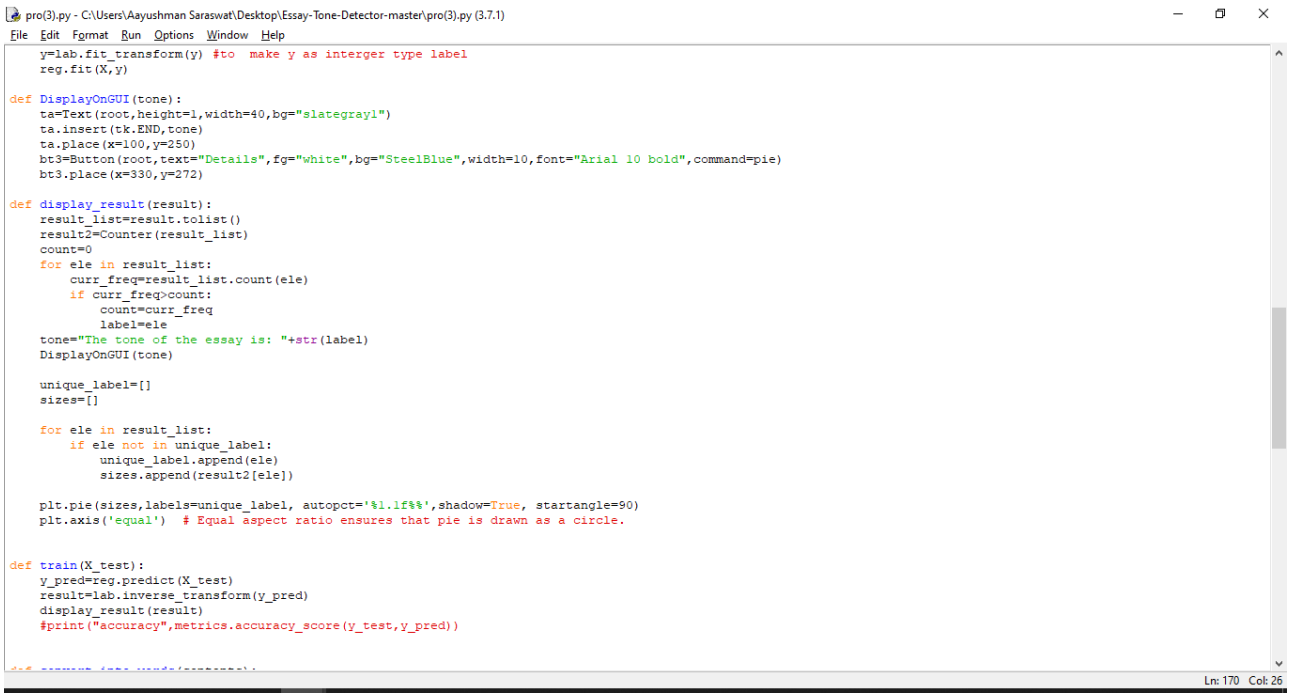


Fig5.3: Code

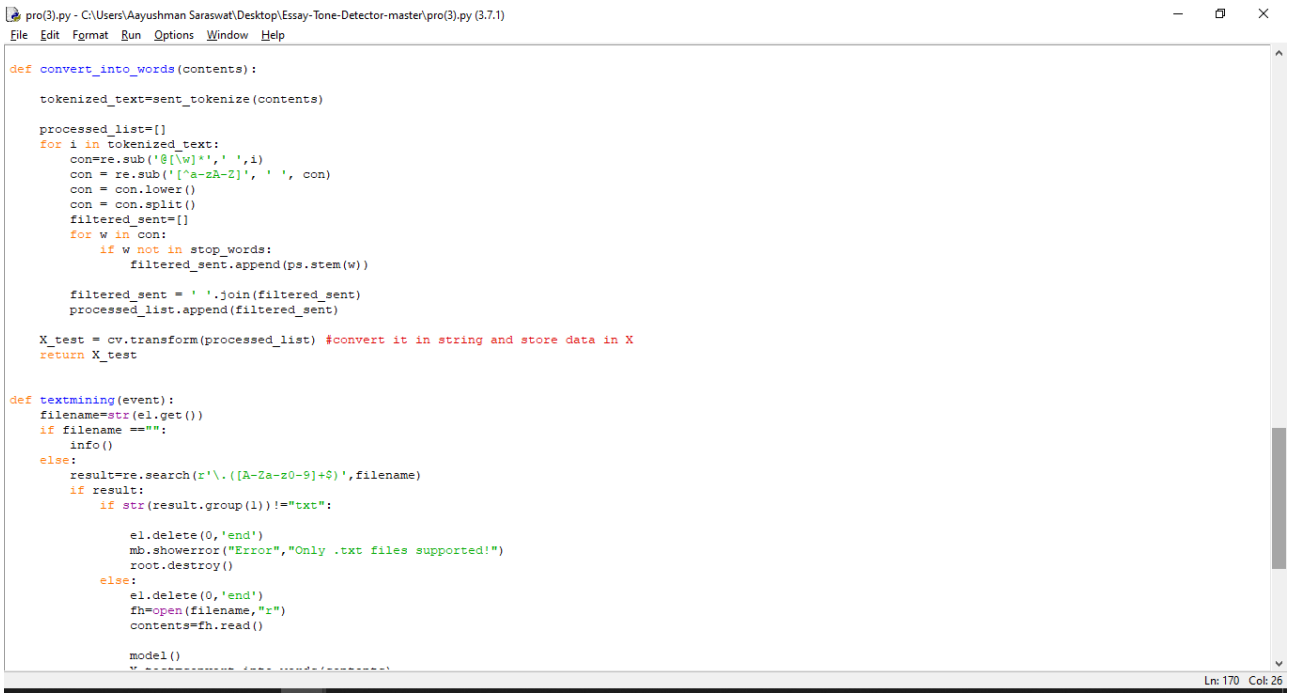


Fig5.4: Code

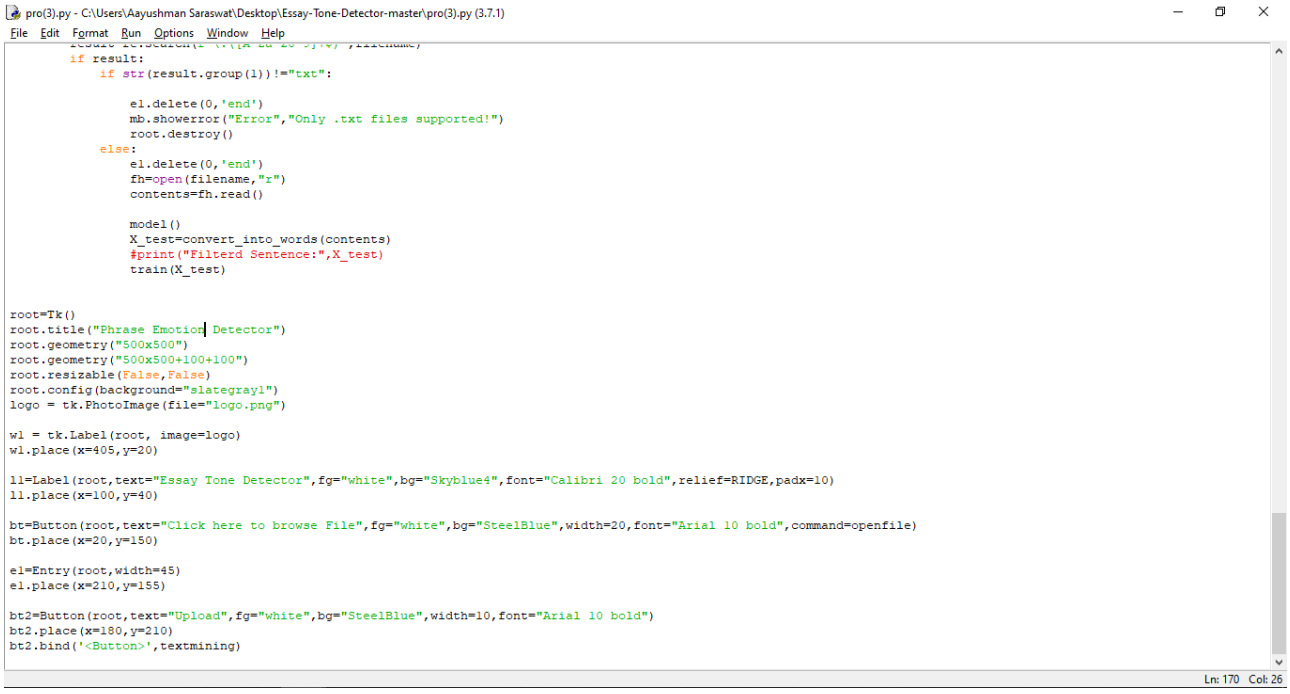


Fig5.5: Code

4.3 Output

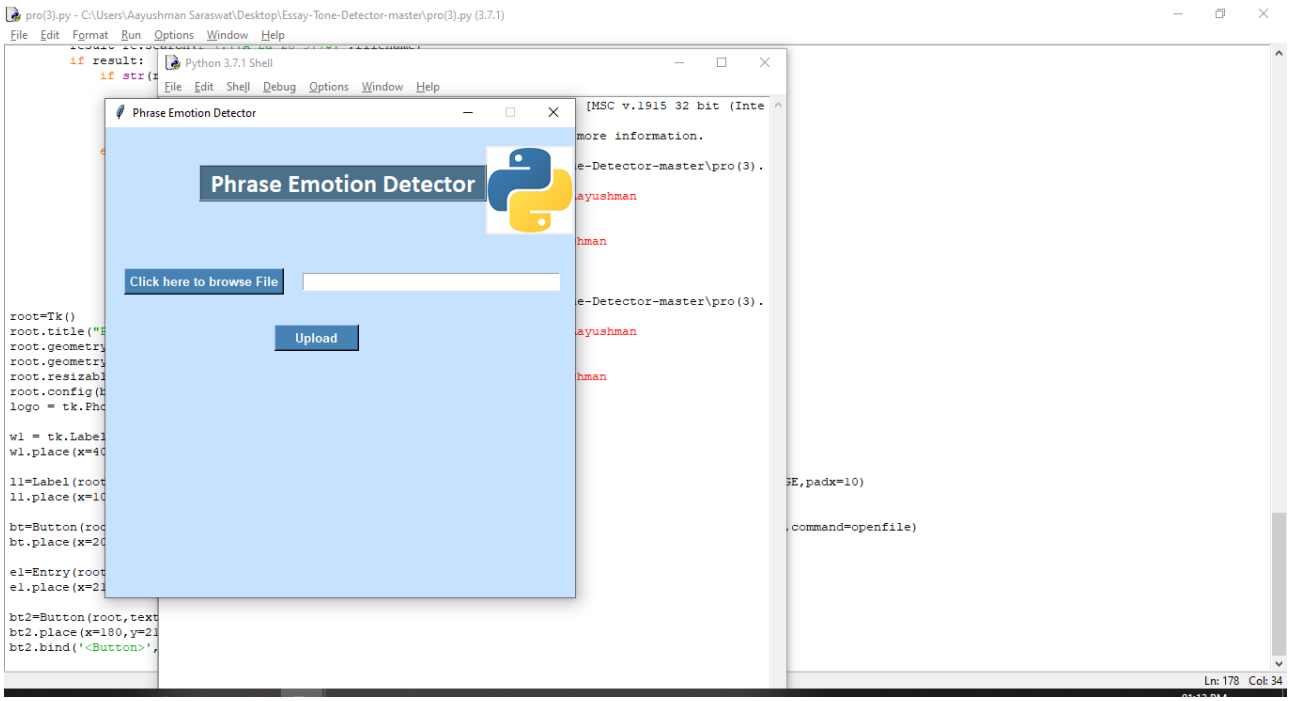


Fig6.1: Output when program is run

4.4 Input Text File

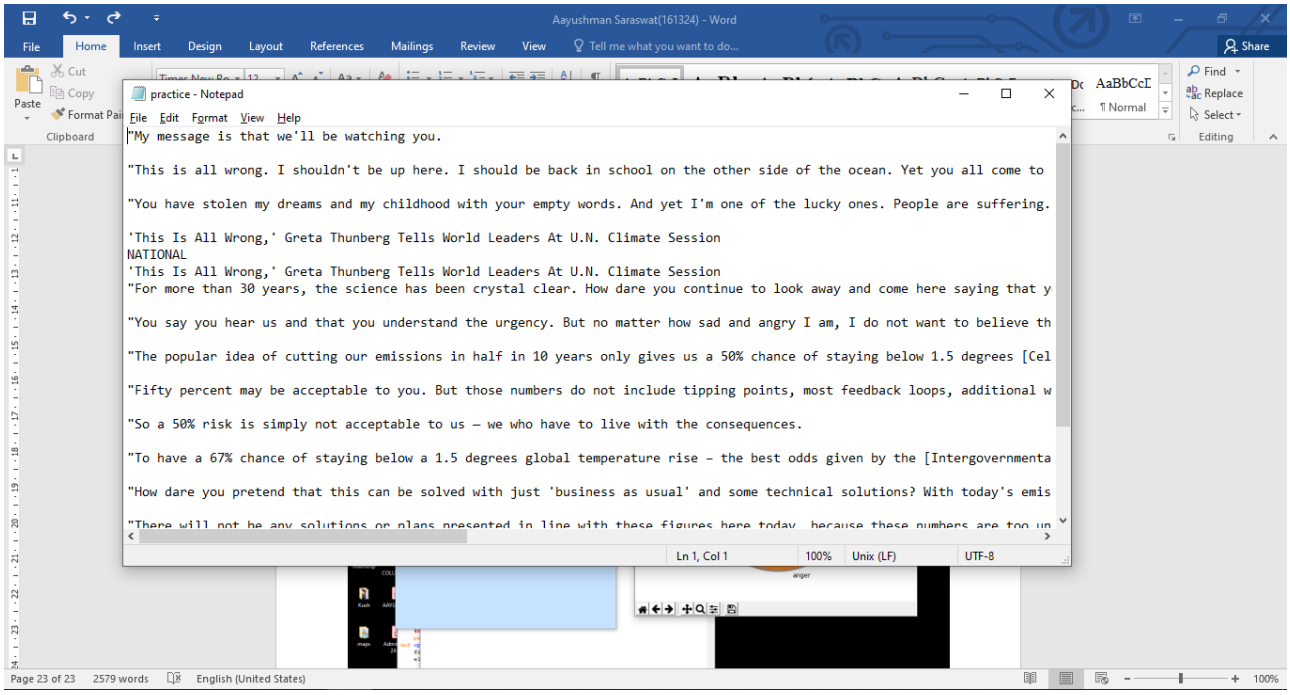


Fig6.2: Input text file

4.5 Final Output

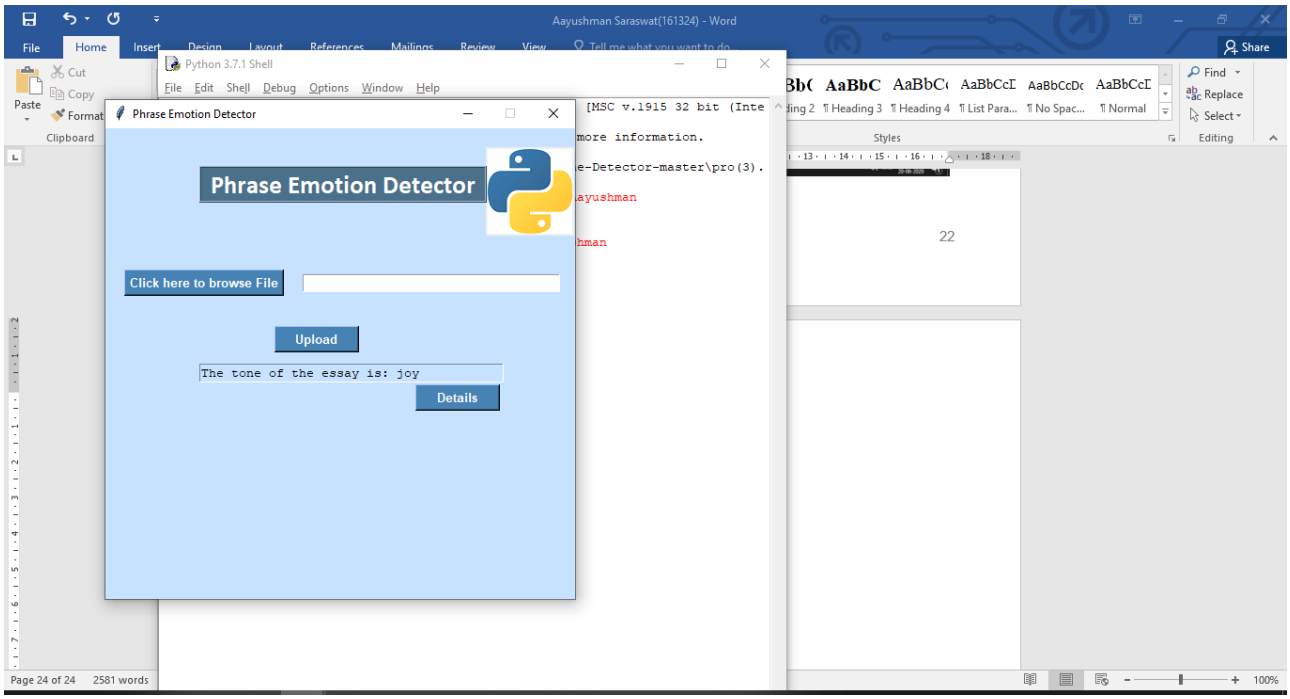


Fig6.3: Figure Shows tone of essay

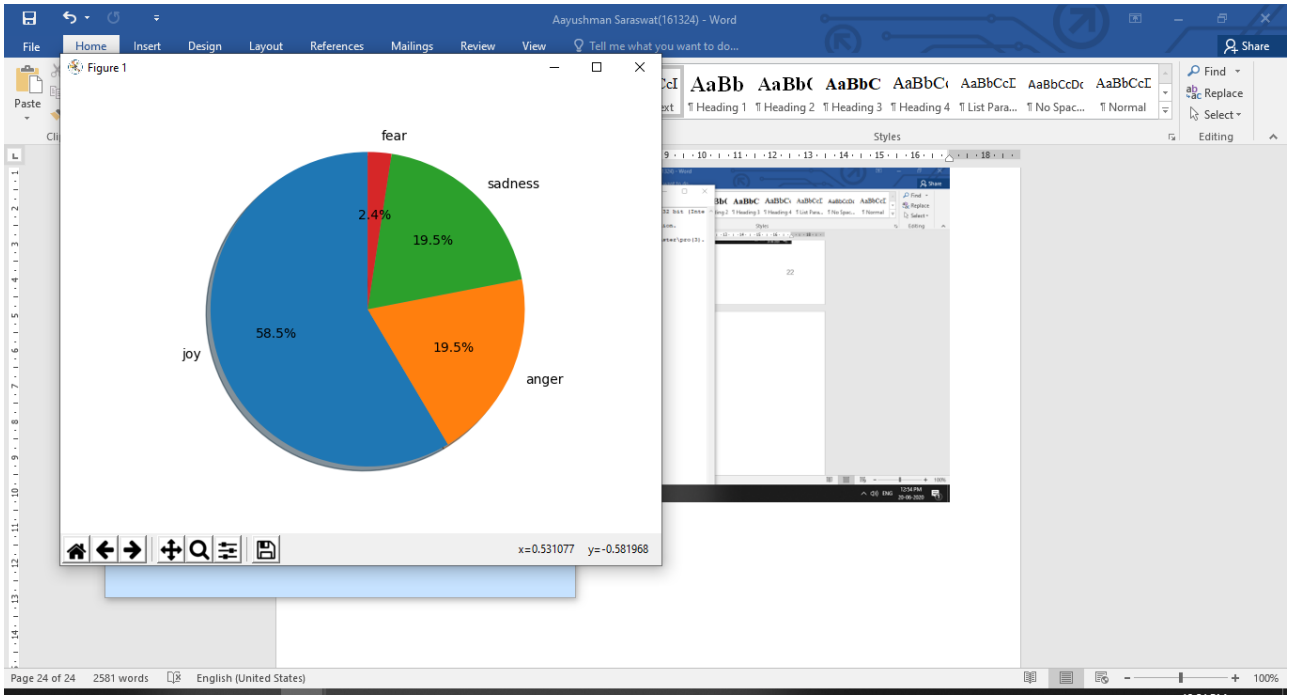


Fig6.3: Depicting Various emotions via pie chart

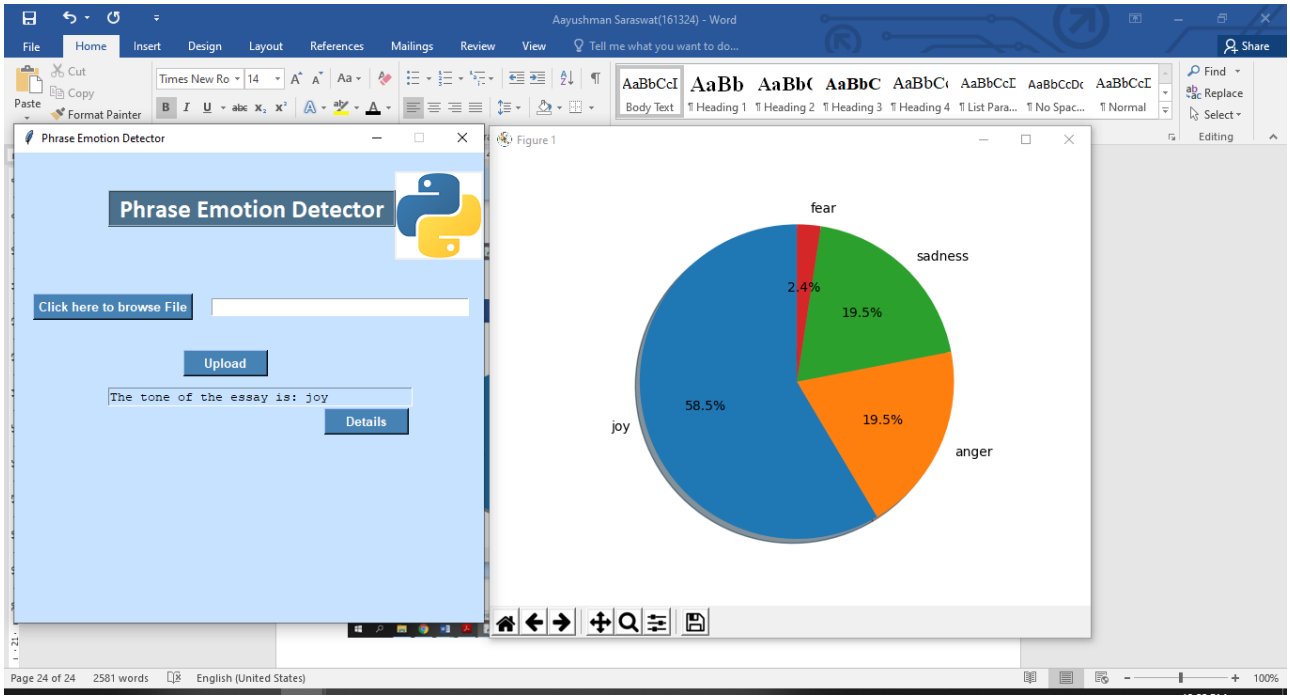


Fig6.4: Combined Images

CHAPTER 5
CONCLUSION

Sentiment analysis is the interpretation and classification of emotions (positive , negative and neutral) in text data using text analysis techniques. Sentiment analysis allows businesses to identify customer feelings about products , brands or services in online conversations and feedback.

To conclude, we have discussed the whole process of development of this system and we can rely on this system.

Future Scope

The project can be merged with the operating system kernel in order to provide a better interface for users and the pages containing data mining tools can be better applied to control the variation of keywords / hash tags over time and can be used in many areas mainly :

- Political Campaign strategy management
- Product launch
- Trend analysis
- Most popular sentiments

References

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[2] www.python.org

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[4] Abdul Hanan et al. Emotion Detection of Text, International Journal of Engineering Research and Development e-ISSN: 2278-067X, p-ISSN: 2278-800X, www.ijerd.com Volume 11, Issue 07 (July 2015), PP.23-34

[5] https://monkeylearn.com/sentiment-analysis

Phrase Emotion Detector

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