

**Project Report on**

**ANALYZING THE POLARITY &  
SUBJECTIVITY OF THE REAL TIME  
UNSTRUCTURED DATA USING NLP**

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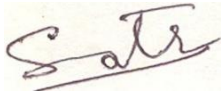
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## DECLARATION

I hereby declare that the work presented in this report entitled “*Analyzing the polarity & subjectivity of the real time unstructured data using Natural Language Processing*” using Twitter® data for various different organizations & individuals in the partial fulfillment of the requirements for the award of the degree of **MBA in Business Analytics** is submitted in the department of University School Of Management and Entrepreneurship, Delhi Technological University.

It is an authentic record of my work carried out over a period from April 2020 to May 2020 under the supervision of **Dr. Deepti Aggrawal**, University School Of management and Entrepreneurship, Delhi Technological University.

This project report has not been submitted for the award of any other degree or diploma.



[Student Signature]

## ACKNOWLEDGEMENT

This project has been a very good experience for me, as I have gained an understanding of analytics and data handling of unstructured data. This project has also made me understand how to analyze sentiments using tweets from Twitter® and has also helped me in gaining an overview of various different sectors.

Firstly, I would like to express my deep sense of gratitude to my supervisor **Dr. Deepti Aggrawal** for her supervision and support during my project. As my supervisor she has constantly guided me to remain focused on achieving my goal, despite of her busy schedule and discussed relatively and gave her valuable suggestions.

I would also like to Thanks Twitter® team , who have helped me in giving a developer account access to extract text and to analyze polarity & subjectivity of tweets, without which , it would have become very difficult for me to get the real time data.

## EXECUTIVE SUMMARY

Sentiment analysis is a technique in tokenizing the phrases , sentences from a language to understand the content and emotions of an individuals. Regular language models are being used and turing machines has been trained in order for better results. It's research is based on text mining & social media content mining. Spread of its significance has covered almost all industries from software engineering to the executives sciences and sociologies to understand the societies movement and mode of interest.

The technology has changed rapidly to bring in change from structured data understanding to unstructured data understanding in all the fields. The developing estimation examination agrees with the development of internet based life, for example, surveys, gathering conversations, sites, miniaturized scale web journals, Twitter® , and informal communities. Frameworks are being applied in pretty much every business and social area since sentiments are integral to all human exercises and are key influencers of our practices.

Real time tweets are analyzed on various different areas for different users using Twitter® as a platform to calculate the polarity and the subjectivity of a text. Negative and positive sentiments of users regarding products and services on Twitter® platform was tracked and visualized to understand their sentiment towards it & their needs.

**Python** is used to extract the data through Twitter® API and preprocess it further to bring insights and understand the users behavior.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Preface

#### Structured Text

Text is said in done organized mean ordered structure. Eg:Excel. It originated from the name for a typical language used to get to database called Structured Query Language. SQL gives approaches to oversee information in database. It can be processed easily.

Proper titles and content could be parsed without trouble and can be handled by methods for rows and column mining. This data can be easily understood and interpreted and even these document can be sorted. Extraction , Transformation , Load exercises can easily be performed using Informatica , Datastage etc. before sending it for OLAP analysis.

#### Unstructured Text

The World Wide Web has been ruled by unstructured substance, and looking through the web has essentially been founded on strategies from Information Retrieval. It speaks to 80% of the information, which incorporates content and interactive media content. Eg: email messages, recordings, photographs, sound documents.

They may have inner structure however flawlessly they don't fit the database. Unstructured content generally it might be either human or machine produced.

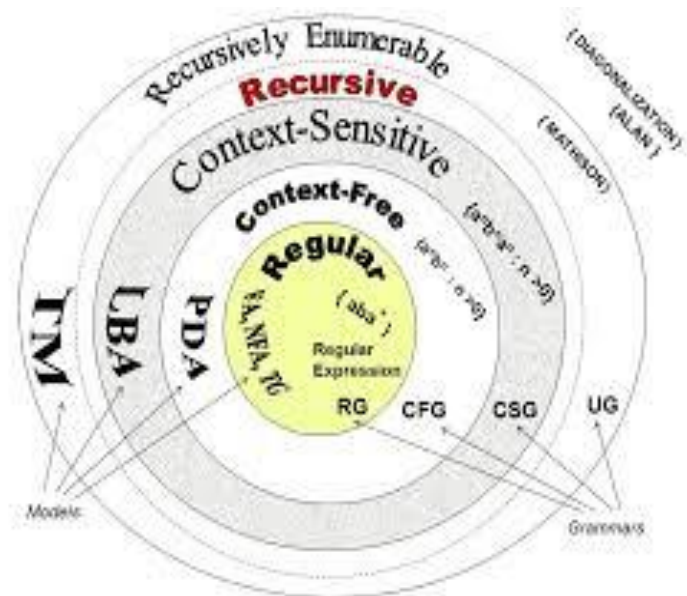
## Regular Expressions

One of the unknown techniques in normalization in software engineering has been the ordinary standard articulation (RE) as shown in Fig 1.1, CFG language for determining content searched strings. This viable language is utilized in each coding languages, word processor, and content preparing apparatuses like the Unix devices grep Officially,anordinaryarticulation is an arithmetical documentation for portraying lot of strings. They are especially use corpus for looking in writings, when we have an example to scan for and a corpus of writings to look through. A standard articulation search capacity will look through the corpus, restoring all messages.

[A-Z] Capitalized letter

[a-z] Lower case letter

[0-9] Solitary digit



**Fig 1.1 Chomsky Normal Form**

## Sentimental Analysis

Sentiment and opinion clearly defines the contrasts between text and its meaning. Sentiments can be perceived as feelings, decisions, sentiments or thoughts incited or covered by feelings or emotions . In Computational Linguistics, the suppositions instead of on emotions or feelings.

There are two sorts of printed data: realities and sentiments data. It can be seen in below chapter for further understanding. While the realities are target articulations about items, highlights, elements, occasions and their attributes, Sentiments are customarily abstract articulations that distinguish individuals. Sentiments, perspectives or emotions toward objects, elements, occasions and their attributes .To highlight , Sentiment examination additionally called - notion mining, feeling arrangement, Sentiment mining, subjectivity examination, survey mining or evaluation extraction, and in a few cases extremity order can manage the computational treatment of abstract, estimation, and supposition in the content .

In addition, referring to Fig 1.2 below, it can be noticed that being emotional doesn't mean that something is not correct . Considering the language used to quick a private circumstance with regards to discussion. Everyone has their own perception of thinking , even on the same topic around them , may be because of their past occurrences or surroundings.



**Fig 1.2** Personal Perceptions



## Opinion Analysis Understanding

Affin is a lexicon in which each word in a dictionary has its respective sentiments and can either aggregate physically or on the other hand be gained naturally using algorithms. Affin algorithm is explained below on page no. 20 of this report.

There is a way to deal with use conclusion examination is with building a vocabulary with data about which words and expressions are certain and which are negative. There are different ways to deal with emotions center around the mining of sentences or whole reports, as opposed to rely upon the equality of words. But in this project, emotions emojis in tweets were not considered. The comment of lexical or corpora is typically done by hand, and classifiers are then prepared with huge arrangements of highlights to order another bunch of words or expressions.

In different cases, the supposition can be communicated, which makes it much progressively hard to recognize what's more, group. The fundamental issue with archive grouping which is that it needs to decide the general supposition qualities of a whole record, while the communicated supposition can be remembered for only one sentence or word. Score of the text, in any case, the setting encompassing these covered up assumptions can give exceptionally gainful data for characterizing it.

In light of this division of the field of conclusion investigation, we regularly talk about word, sentence and record levels of conclusion grouping. Also we discuss mostly, another methodology in the mining of conclusion is on the web. Web conclusion mining targets separating outline, and track different parts of abstract data on the Web. This can demonstrate accommodating for promoting organizations or pattern watchers.

Feeling investigation is generally used for online audits and internet based life for an assortment of utilizations, extending from promoting to client assistance.

## Importance

There are many people , who write and read on the micro blogging sites in the globe. As seen below in the Result section , online day by day interactions turns into the most exciting issue in settling on a preference. The indication by Dimensional Research, percentage of people's concern is as much as close to home thinking.

As stated in one Study: 74 % of client's certainty is based on online individual proposal audits in 2012 , declined in 2012 examination, and further declined to 54 % in 2013 Study. Be that as it may, this rate increments as for 2014 Study . Therefore it is seen that almost 95 % of client's trust on online articles and comments .

## Difficulty

Sentimental Analysis is hard for machines or even outlandish while it is simple for people. It is probably difficult for the Computer to recognize few articles and recognizing few substances, emojis , expression on photo , highlights or examples .Let's discuss few circumstances below which are not managed properly in today's era.

## Machines :

- Dealing with sarcasm, leads to difficulty in understanding that the inverse of the sentence meaning.
- Pronoun in phrases is also a matter of concern.
- Understanding the Strength of a agenda leads in perceiving as task for the suppositions which have various metrics.

## Basics & Opinion in Natural Language processing

### Natural language processing (NLP) :

Recent but very interesting field of study. It is a territory of the computer engineering, human interactions, and computational phonetics between the connections among computer and human dialects. Most of the organizations are working on it .

Characteristically, Natural Language Processing is identified with the field of human & computer connections. Multiple issues in NLP raises normal language understanding , what is empowering computer to conclude significance from human or regular language input by people .Techniques applied in this project is theoretically discussed below. The term of Natural Language extraction includes various methods for controlling what's more to extent , looking after human dialects.

- ***Token***

- ✚ Before any real processing can be done on the input text, it needs to be segmented into linguistic units such as words, punctuation, and numbers or alphanumeric. These units are recognized as tokens.

- ***Sentence***

- ✚ This alludes to an arranged succession of tokens.

- ***Tokenization***

- ✚ The activity of parting a sentence into its constitutive tokens.

- ***Corpus***

- ✚ This implies a collection of content, for the most part including an enormous number of sentences.

- ***Part-of-speech (POS) Tag***

- ✚ A word can be arranged into at least one of a lot of lexical or grammatical feature classes, for example, Nouns, Verbs, Adjectives and Articles, to give some examples.

A POS tag is NN (Noun), VB (Verb), JJ (Adjective), AT (Article).

- ***Parse Tree***

- ✚ It speaks to a tree characterized over a given sentence that deciphers the syntactic structure of the sentence as related to a proper punctuation.

- ***Part-Of-Speech (POS) Tagging***

- ✚ In sentence lot of POS labels, a shared language handling task is to consequently indicate POS labels to each word in the sentences.

- ***Parsing***

- ✚ There are a few parsers expect the presence of a lot of language rules to parse yet late parsers are sufficiently brilliant , as most parsers likewise work in an administered setting and require the sentence to be POS-labeled before it tends to be parsed.

- ✚ In the parsing task, a parser constructs the parse tree given a sentence. to find the parse trees legitimately from the given information utilizing complex factual models .

- ✚ Measurable parsing is a region of dynamic research in NLP.

- *Subjective Sentence*

- ✚ It is a sentence where the author communicates their emotions or suppositions toward substances, occasions and their properties

- *Objective Sentence*

- ✚ It is a real sentence about substances, occasions, and their properties

- *Opinion*

- ✚ It is a conviction or judgment dependent on uncommon information towards a subject. Suppositions are here and there communicated unequivocally like: "The shake is stunning." But now and again they are covered up in the conclusion of a sentence, for instance; "The toothbrush broke in two days".

- ✚ Since the idea of conclusion is wide, supposition characterization for the most part focuses on the general inclination communicated by assessments (Positive/Negative).

- ✚ Actually, energy or antagonism is deciding the Polarity of a supposition.

Opinion words

- ✚ The intent behind these words deliver the significance of positive or negative conclusion.

For example:

{Awesome, Lovable, Outstanding, Positive Energy} → Positive sentiment

{Terrible, Very Bad, Failure, Wrong} → Negative sentiment

Polarity - It demonstrates whether the communicated conclusion by sentiment words is certain, negative or nonpartisan.

### Opinion Sentence

✚ It is a sentence which contains at least one feeling words.

### Overall

- The goal of Sentiment Analysis is assessing the emotions and assessments of an essayist separately, based on lexicon and on theme space or multi-point area.
- This results can be based on assessments or some surveys taken to check the sentiments.
- The machine observation for write ups, tweets and feelings communicated in writings are the difficulties in handling normal language.
- Information Retrieval and Natural Language Processing approaches can be helpful as far as concern for supposition mining and investigation.
- The practical scenario of real time handling of human dialects can be seen in below chapters which might help in more good understanding of a project.

## 1.2 Objective of the study

### Project overview

### Title of the Study

Analyzing the Polarity & Subjectivity of the Real Time Unstructured Data using NLP

### Objective of the Study

- The understanding of this project comes under, natural language processing and it's ways to note down the perspective, companies product, state of mind, or emotions of the person towards a product, tangible and non tangible services, movies, etc.
- Twitter® is well known social media platform that permits users to share information by means of frequent tweets with the help of hash tags and key words referred to as tweets on a real-time basis as per the flashed issues.
- Twitter® is an internet application which can be developed in associated with nursing its purpose to use sentiment analysis and its visualization through application , exploitation hash tags and @keywords.
- The motivation is to analyze the feelings as positive and negative for a specific product and repair that which helps organizations understanding the results.
- Inline graphs in Interpretation section below , will show that real time Twitter® sentiments can describe the information in period of time, and acquire visualize data continuously.
- Twitter Developer Labs allows to take an access to of their API for analysis.

## **CHAPTER 2**

### **LITERATURE REVIEW**

In this chapter discussion will be on various research papers, published in reputed conferences & journals that enabled us to set the objective & obtain a suitable solution. Work carried out in area of sentimental analysis is discussed inline.

In Cambria et al. (2013) focus was to extract the views of the society and the events, companies vision, political views, marketing strategies and product preferences by using the conceptual opinion technique.

The work in , Pak and Paroubek (2010) and Gamallo and Garcia (2014), researchers focused mainly on internet site Twitter® by extracting data in corpus and analyzing the polarity & subjectivity of the recorded tweets.

Thoughts on social media on daily basis in contrast to current scenario was given in Ravi and Ravi (2015) .This work portrays views in many articles almost hundred regarding sentiment analysis.

In Tumasjan et al.(2010) over 100,000 tweets on German federal elections were analyzed. It recorded the movement of opinions before and after the elections. Therefore, seeing the count of tweets it was concluded that Twitter® is a good platform to analyze the sentiments.

In the paper Mostafa (2013), micro blogging sites have been used for exploring CRM, society views and text mining etc. Twitter® is mostly used site for capturing people perceptions. It has been observed that marketing research based companies use these sites.



Twitter® is a smaller scale blogging site that has gotten progressively well known with the system network. Clients update short messages, otherwise called Tweets, which are constrained to 280 characters. Breaking point is 280 characters, the most well-known length of a tweet is 33 characters.

To highlight , 9% of tweets hit Twitter® 's 140-character limit. Recently it's 1%. Twitter® saw some effect from the multiplying of characters include regarding how individuals compose their messages.

Society tweet their genuine beliefs regarding numerous matters, examine current points and expound on life occasions through tweets.

The developing marvels of web based life, for example, Facebook® , Twitter® , LinkedIn® , and Instagram® , with every one has its own qualities and its uses, are continually influencing out societies.

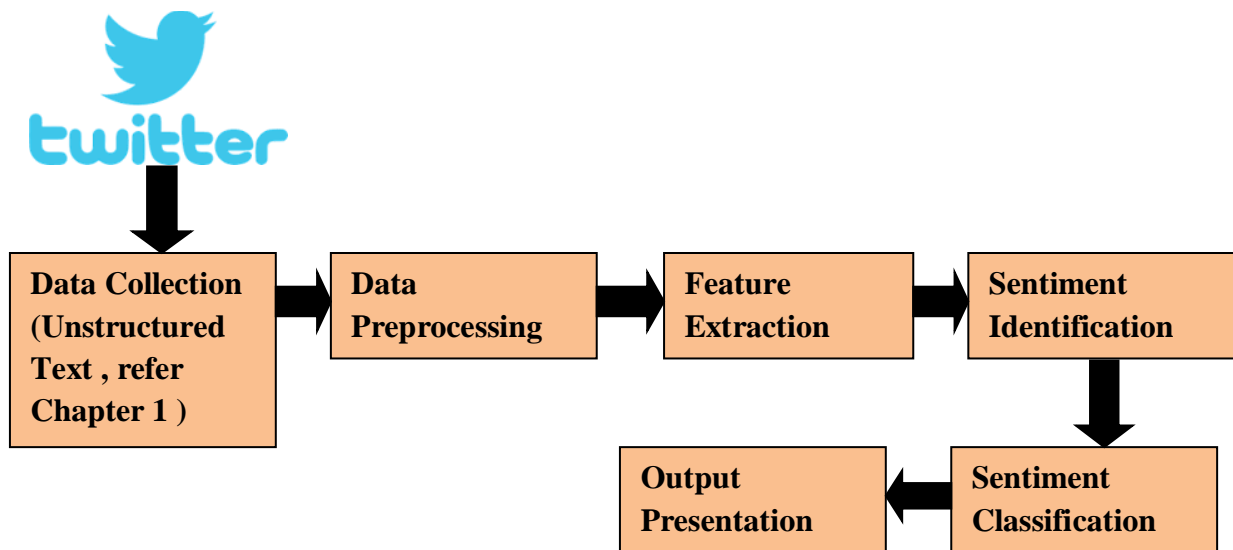
Twitter® for information investigation, where Twitter® is an internet organizing administration that empowers clients to send and peruse short 140-character messages called "tweets". The venture continues as follows, strategy used to recover Twitter® information, scratching Tweets , Text Pre-preparing , Feature Extractions, Identifying Sentiments , Calculating Scores , Plotting Graphs.

## CHAPTER 3

### RESEARCH METHODOLOGY

Sentiment Analysis can be defined as a systematic analysis of online expressions.

There are 5 steps shown in the Fig 3.1 which were followed in order to analyze the sentiment data. Process is explained with the help of flow chart.



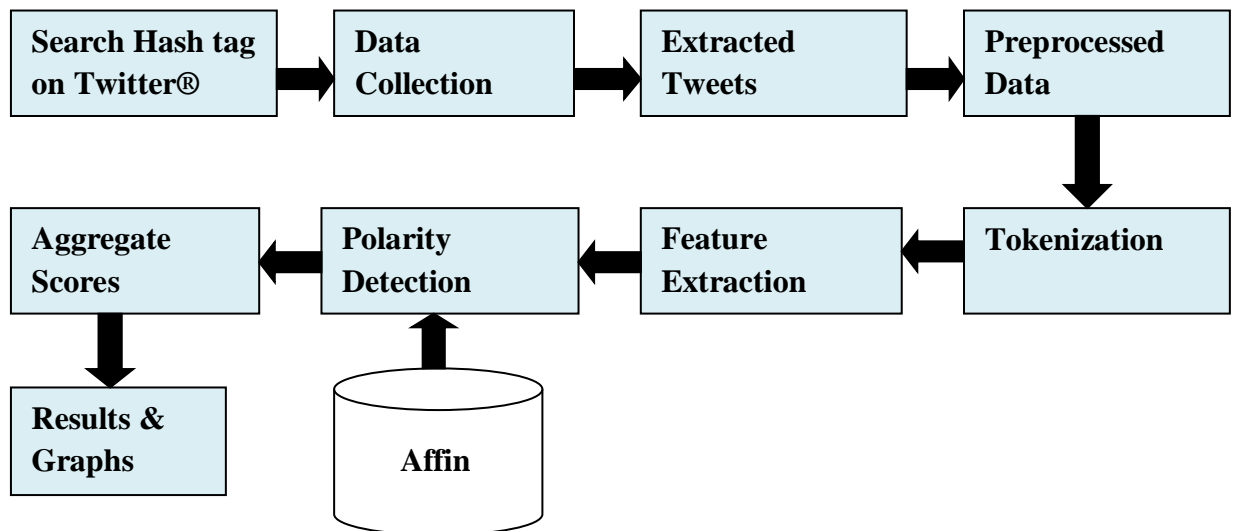
**Fig 3.1** Sentiments Analyzing Steps

## Approach

In Fig 3.2 , in Real-Time Twitter® , the data is searched through the app designed in python in form of keywords or hash tags followed by search words and then all the tweets are extracted forming a corpus or saved in a file , on which they are processed for cleaning to bring useful insights. Affin lexicon is used in calculating the polarity and further leading to plot bar graphs and line graphs for better understanding.

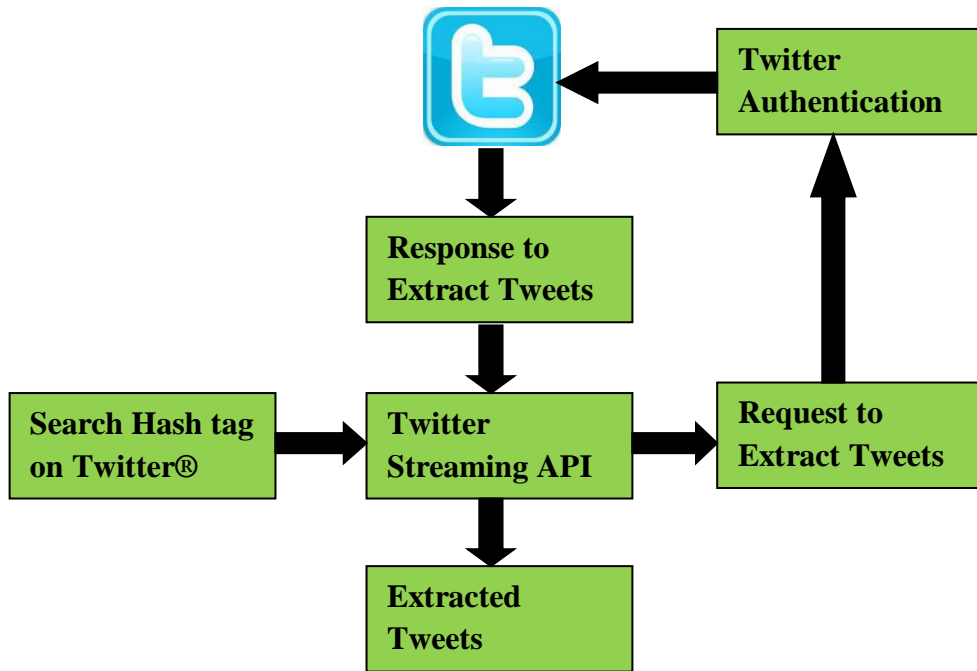
In this project , the help of affin lexicon is taken for referencing sentiment vocabulary into an enormous word reference or corpus where a predefined rundown of words along with individual supposition extremity direction and score.

Positive words delineate wanted and good conditions, though negative words portray undesired and horrible conditions.



**Fig 3.2** Procedure to process Tweets

## Data Collection



**Fig 3.3** Data Collection from Twitter

Referring to the Fig 3.3 , It can be understood that users who use social media often usually write their view by which their sentiments can be observed on public forums like the various blogs, quora, reddit boards , product reviews as well as on their private logs Micro blogging sites like Face book® and Twitter® contains lot of active perceptions.

So , collecting data from twitter is comparatively easier as it contains almost all organization accounts and actions here are taken very fast by respective organizations , therefore people remain active in tweeting the relative opinion or perception and feel motivated on this platform.

Special programming languages like '**python**' is used to process and analyze the data.

## Twitter® Authentication

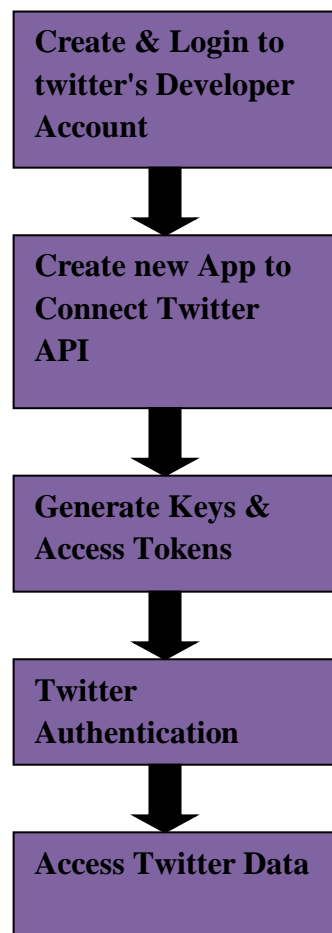
As shown below in Fig 3.4 , it is needed to get 4 components of data from Twitter® to access the Twitter® streaming tweets , the API is required . The key, Secret Key, Access token and Access secret is being requested. The keys are given as per below in the stream liner to read the tweets creating an app , in this project it's shown below how is it created in code snippets.

```
auth_secret_consumer = OAuthHandler (key, secret)
```

```
auth_token_Access = (token, secret)
```

```
Twitter® Stream = Stream(auth, listener())
```

```
Twitter® Stream.filter(track=[inp])
```



**Fig 3.4** Twitter Authentication Process

## Data Cleaning

It incorporates Removal of pointless information, for example, Special characters , blank areas ,HTML Tags and happens from the Twitter® dataset.

Information cleaning is accomplished by bringing in normal (RE) python library.

## Stop Words Removal

Stop words are therefore, hence is, the , but , that and are the arrangement of usually utilized words in English as well as in some other language. Stop words center around significant word as it were rather than usually utilized words in a language.

## Lemmatization

Lemmatization is like stemming with a distinction.

Lemmatization is to lessen word structures and again derivational related types of a word to a typical base structure.

Lemmatization for the most part identifies with doing stuff effectively utilizing a term jargon and morphological investigation, ordinarily pointed exclusively at expelling intonation marks what's more, coming back to the base or word reference type of a word perceived as the lemma.

## Feature Extraction

Highlight extraction is a significant advance in supposition mining that produces a rundown of item, perspective, highlights, and sentiments. The reason for include extraction is to remove Sentiment sentences which contain at least one highlights, viewpoints, and feelings.

### Sentiment Identification

On the off chance that the word is absent in both the word list, at that point the estimation is considered as impartial. After the process negative and positive words are found. In the text if positive concludes the list, at that point the positive emotion is allotted to the relating highlight. Supposedly , the word is available in the negative list, at that point the negative notion is allotted to the relating highlight.

Along these lines, the last polarity score as discussed above for the tweets is determined by taking away the negative score from the positive score.

### Presentation of Output

The primary thought of conclusion examination is to change over unstructured content into important data.

After the finish of investigation, the content outcomes in this project below are shown on diagrams like line charts and bar charts for more clearly understanding and visualization.

## CHAPTER 4

### CODE SNIPPETS & RESULTS

#### Text Process

In the code below , after data splitting , the text is processed by checking on '\', then removing it and when incase backward slash is not found then the text all together is added with a space in between and normalizing it. Where ever '{' or '}' is found , it is replaced by a space and hence the tweets gets cleaned in a similar manner throughout to process it further for Natural language Processing.

```
4 cols = data.split(",")
5
6 j=0
7 datafin = []
8 datafin.append(cols[0])
9
10 bad_chars = ['{', '}']
11
12 for i in range(1, len(cols)):
13     if(cols[i][0]!='\\'):
14         datafin.append(cols[i])
15     else:
16         datafin[len(datafin)-1] = datafin[len(datafin)-1] + "," + cols[i]
17
18 cleaned = []
19 for i in range(0, len(datafin)):
20     for j in range(0, len(datafin[i])):
21         res=[]
22         temp = datafin[i].split(':')
23         if(len(temp)!=2):
24             count=0
25             for k in range(1, len(temp)):
26                 if('{ ' in temp[k]):
27                     count=k
28
29             res.append(temp[count])
30             st = ""
31             for k in range(count+1, len(temp)):
32                 if not st:
33                     st=st+temp[k]
34                 else:
35                     st=st+":"+temp[k]
36             res.append(st)
37         else:
38             res = temp
39         cleaned.append(res)
40
41 for i in range(0, len(cleaned)):
```



```

textfin=""

isflag=0

for line in cleaned:
    if "full_text" in line:
        isflag=1
        temp = line.split(",", 1)[1]
        textfin = temp[2:len(temp)-3]

if isflag is 0:
    for line in cleaned:
        temp = line.split("\'")
        if "text" in temp:
            temp2 = line.split(",", 1)[1]
            textfin = temp2[2:len(temp2)-3]

return(textfin)

```

## Affin Lexicon

In the below snippet, various filenames as mentioned are called in a class `AfinnException` which contains various list of words with their sentiment scores -5 to +5 along with them .They are used in the code for calculating polarity of the tweets processed.

```

4 from __future__ import absolute_import, division, print_function
5
6 import codecs
7
8 import re
9
10 from os.path import dirname, join
11
12
13 LANGUAGE_TO_FILENAME = {
14     'da': 'AFINN-da-32.txt',
15     'en': 'AFINN-en-165.txt',
16     'emoticons': 'AFINN-emoticon-8.txt',
17     'fr': 'AFINN-fr-165.txt',
18     'sv': 'AFINN-sv-165.txt',
19 }
20
21
22 class AfinnException(Exception):
23     """Base for exceptions raised in this module."""
24
25     pass
26
27
28 class WordListReadingError(AfinnException):
29     """Exception for error when reading information form data files."""
30
31     pass
32
33

```

## Contraction Map

In the snippet below , contraction map are called for expanding and creating common English contractions in actual words to normalize the text. It performs contraction by simple replacement rules as given below to give the better results and no discrepancies.

```
8 CONTRACTION_MAP = {
9   "ain't": "is not",
10  "aren't": "are not",
11  "can't": "cannot",
12  "can't've": "cannot have",
13  "'cause": "because",
14  "could've": "could have",
15  "couldn't": "could not",
16  "couldn't've": "could not have",
17  "didn't": "did not",
18  "doesn't": "does not",
19  "don't": "do not",
20  "hadn't": "had not",
21  "hadn't've": "had not have",
22  "hasn't": "has not",
23  "haven't": "have not",
24  "he'd": "he would",
25  "he'd've": "he would have",
26  "he'll": "he will",
27  "he'll've": "he he will have",
28  "he's": "he is",
29  "how'd": "how did",
30  "how'd'y": "how do you",
31  "how'll": "how will",
32  "how's": "how is",
33  "I'd": "I would",
34  "I'd've": "I would have",
35  "I'll": "I will",
36  "I'll've": "I will have",
37  "I'm": "I am",
38  "I've": "I have",
39  "i'd": "i would",
40  "i'd've": "i would have",
41  "i'll": "i will",
42  "i'll've": "i will have",
43  "i'm": "i am",
44  "i've": "i have",
```

## Natural Language Processing

In the below snippet , after importing affinn library and loading en\_core\_web\_sm database for natural language processing , preprocessing of text is followed by defining various functions such as lemmatization , stop words etc. as explained above in the report in Chapter 3. The normalize\_corpus function is designed to store all the extracted streaming tweets for processing by calling all other functions as shown below.

Further all sentences are normalized from starting string till end string and keep on making a final sentence in datafin as defined with relevant spacing and being called in a corpus as an argument to do natural language processing. Lastly , scores associated with words referred from affinn is used to calculate the final polarity of a sentence defined as snum in the code below.

```
8 from affinn import Affinn
9
10 nlp = spacy.load('en_core_web_sm')
11
12 tokenizer = ToktokTokenizer()
13 stopword_list = nltk.corpus.stopwords.words('english')
14 stopword_list.remove('no')
15 stopword_list.remove('not')
16
17 def remove_accented_chars(text):
18     text = unicodedata.normalize('NFKD', text).encode('ascii', 'ignore').decode
19     return text
20
21 def expand_contractions(text, contraction_mapping=CONTRACTION_MAP):
22
23     contractions_pattern = re.compile('{{}}'.format('|'.join(contraction_mappin
24
25     def expand_match(contraction):
26         match = contraction.group(0)
27         first_char = match[0]
28         expanded_contraction = contraction_mapping.get(match)\
29             if contraction_mapping.get(match)\
30             else contraction_mapping.get(match.lower())
31
32
33         expanded_contraction = first_char+expanded_contraction[1:]
34         return expanded_contraction
35
36     expanded_text = contractions_pattern.sub(expand_match, text)
37     expanded_text = re.sub("'", "", expanded_text)
38
39     return expanded_text
40
41 def remove_special_characters(text, remove_digits=False):
42     pattern = r'^[a-zA-z0-9\s]' if not remove_digits else r'^[a-zA-z\s]'
43     text = re.sub(pattern, '', text)
44     return text
```

```

46 def simple_stemmer(text):
47     ps = nltk.porter.PorterStemmer()
48     text = ' '.join([ps.stem(word) for word in text.split()])
49     return text
50
51 def lemmatize_text(text):
52     text = nlp(text)
53     text = ' '.join([word.lemma_ if word.lemma_ != '-PRON-' else word.text for
54     return text
55
56 def remove_stopwords(text, is_lower_case=False):
57     tokens = tokenizer.tokenize(text)
58     tokens = [token.strip() for token in tokens]
59     if is_lower_case:
60         filtered_tokens = [token for token in tokens if token not in stopwords_
61     else:
62         filtered_tokens = [token for token in tokens if token.lower() not in s
63     filtered_text = ' '.join(filtered_tokens)
64     return filtered_text
65
66 def normalize_corpus(corpus, contraction_expansion=True, accented_char_removal
67
68     normalized_corpus = []
69     for doc in corpus:
70         if accented_char_removal:
71             doc = remove_accented_chars(doc)
72         if contraction_expansion:
73             doc = expand_contractions(doc)
74         if text_lower_case:
75             doc = doc.lower()
76         doc = re.sub(r'[\r|\n|\r\n|]+', ' ', doc)
77         if text_lemmatization:
78             doc = lemmatize_text(doc)
79         if special_char_removal:
80             special_char_pattern = re.compile(r'[{(-)!}]')
81             doc = special_char_pattern.sub(" \\1 ", doc)

```

```

100 data = arg1
101
102 datalist = data.split(' ')
103
104 data2 = normalize_corpus(datalist)
105
106 # Normalized sentences
107
108 sentences = data.split('.')
109 sentence_norm = []
110 for i in range(0, len(sentences)):
111     sent = normalize_corpus(sentences[i].split(' '))
112     temp=""
113     for j in range(0, len(sent)):
114         if(sent[j]!=' '):
115             temp=temp+sent[j]+' '
116
117     if(temp!=''):
118         sentence_norm.append(temp)
119
120
121 datafin=""
122 for i in range(0, len(data2)):
123     if(data2[i]!=''):
124         datafin=datafin+data2[i]+" "
125
126 # Does all the basic pre-processing on text
127 corpus = normalize_corpus(data2, text_lower_case=False, special_char_remove
128
129 sentence = str(datafin)
130 sentence_nlp = nlp(sentence)
131
132 # print(datafin)
133
134 afinn = Afinn()
135 sc = afinn.scores(datafin)
136 scnum = float(sum(sc))

```

## Twitter® Sentiments

Finally in the code below, it is shown that the Authentication keys as mentioned in the Chapter 3 , were received by requesting on twitter developer account. Personal use only.

Two files named Scores.txt and Tweets.txt is created on a disk and data is been stored when the app StdOutListener is executed after defining the filter for the twitter tweets to be searched for and setting the language mode ; where in here it is coded as English.

```
13 access_token = "1133313140995702786-ob5McJrC7A1H1nssygvXyldQT0dv4H"
14 access_token_secret = "OVqypvKUh9Z3f9I9yy5SDdXazp8YncaJlqFzvPr70SyvL"
15 consumer_key = "D8qFUW082ez3gr3MRQSJwDqZY"
16 consumer_secret = "R7mAw2VE4M8qYCPFM3rYq1YGQXa1QNjb0pAWh81V3M3vwwlHA1"
17
18 save_file = open('Tweets.txt', 'a')
19 save_file = open('Scores.txt', 'a')
20
21 class StdOutListener(StreamListener):
22     def on_data(self, data):
23         text = Process_Integrated.main(data)
24         print(text)
25         with open('Tweets.txt','a') as tf:
26             tf.write('\n')
27             tf.write(text)
28         score = NLP_Integrated.main(text)
29
30         print(score)
31         with open('Scores.txt','a') as sf:
32             sf.write('\n')
33             sf.write(str(score))
34
35         return True
36
37     def on_error(self, status):
38         print (status)
39
40 l = StdOutListener()
41 auth = OAuthHandler(consumer_key, consumer_secret)
42 auth.set_access_token(access_token, access_token_secret)
43 stream = Stream(auth, l)
44 stream.filter(track=["@Narendramodi"], languages = ["en"])
45
46
```

## Graphs

The code snippets below show that the library used is matplotlib for the graph visualizations in python.

In the first snippet, the line graph is plotted based on the scores of the tweets received in a Scores.txt, setting the labels as Score Vs Time respective of tweets streamed.

```
1 import matplotlib.pyplot as plt
2 %matplotlib notebook
3 plt.plot([2.0,
4 4.0,
5 4.0,
6 0.0,
7 -5.0,
8 0.0,
9 2.0,
10 -1.0,
11 4.0,
12 4.0,
13 -2.0,
14 3.0,
15 1.0,
16 1.0,
17 ])
18 plt.ylabel('Score')
19 plt.xlabel('Time')
20 plt.show()
```

In the code snippet below, it tells that, algorithm, if else, will check for positive, negative and neutral sentiments based on the score of the tweets and plot the bar graph.

```
8 # checking condition
9 if num >= 0:
10     pos_count += 1
11
12 elif num == 0:
13     neutral_count += 1
14
15 else:
16     neg_count += 1
17
18 print("Positive Sentiments : ", pos_count)
19 print("Negative Sentiments : ", neg_count)
20 print("Neutral Sentiments : ", neutral_count)
21
22 import matplotlib.pyplot as plt
23 fig = plt.figure()
24 ax = fig.add_axes([0,0,1,1])
25 langs = ['Positive Sentiments', 'Negative Sentiments', 'Neutral Sentiments']
26 students = [pos_count, neg_count, neutral_count]
27 ax.bar(langs, students)
28 plt.show()
```

## RESULTS

The results of the above program has been stored in two separate file on the disk and used further for analysis. The two files Scores.txt and Tweets. txt is generated. Wherein , Scores.txt contains all the scores of the streaming tweets and Tweet.txt stores all the tweets for the specific hash tag or for the keyword searched.

The location path along with the details is mentioned below in the Annexure after references section in this report.

The output of few tweets along with their respective scores is shown below.

### *Tweets & Calculated Score :*

*#SaveAdarshCredit #SaveAdarshCredit \nRespected all we request you to look into the matter of Adarsh credit cooperative society and do the needful for the payment of investors and employees. A positive response is awaited.\n@narendramodi \n@RSSorg \n@PMOIndia @nstomar @AmitShah https://t.co/PkN3MLwin*

*2.0*

*@narendramodi Ji, Indian #trade is struggling for survival. #CFSs which is controlled by @cbic\_india continue to not adhere @shipmin\_india @cbic\_india \u2018s order & force trade\#importers to pay hefty charges. #6000units fears closure. @PMOIndia we seek ur kind attention & support\ud83d\ude4f\ud83c\udff*

*-1.0*

*Food distribution going on in jammu since morning. Thanks \ud83d\ude4f to friends who are traders and come forward to a noble cause of feeding poor. Seva paramo dharma.\n@narendramodi \n@AmitShah*

*3.0*



*A man in Palamaneru, Chitoor, #AndhraPradesh came home drunk & beat his wife & 18-year-old daughter. The wife and daughter ended their lives. Now who would take up responsibility for this @AndhraPradeshCM @ysjagan or @PMOIndia @narendramodi !? #WineShops #COVID19 #APIInUnsafeHands  
<https://t.co/4sGtyIpJo>*

*-1.0*

*#OpenUSConsulate #OpenUSEmbassyIndia @MEAIndia @PMOIndia @AmitShah @narendramodi @USAmbIndia @USAndIndia @NikunjGargN @kishanreddybjp @MIB\_India @PIBHomeAffairs @Secretary\_MoPR @Geeta\_Mohan  
Many NRIs are stranded for more than 2 months. Please open the US consulates and help u*

*3.0*

*@bhupeshbaghel @DrRPNishank @narendramodi @PMOIndia Sir, Our School has been made quarantine cntr for #labours. There are ab. 200 inmates residing in the campus. The staff are in a state of distress sir. It is kindly requested not to include our JNV BILASPUR CG as quarantine cntr*

*-2.0*

*For many of us Tourism is not only our job, it's our passion too. Your silence literally kills our lives and passion too. Please save our lives and Tourism too... #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_indi*

*2.0*

*#SaveAdarshCredit @narendramodi @PMOIndia Sir, Our Authority Central Registrar want to Appoint Liquidator Forcefully on ||"ADARSH CREDIT COOPERATIVE SOCIETY LTD.||" STILL THERE IS OPTION TO APPOINT ADMINISTATOR TO REGULARIZE WORK OPERATION OF ADARSH PAN INDIA ! PLEASE DO THE NEEDFU*

*3.0*

*#YesBank\_AT1\_RetailInvestor Please save our lives from getting written down by the draconian step of write down of AT1 bonds by @YESBANK ! Our life savings are at stake @FinMinIndia @nsitharaman @PMOIndia @narendramodi @RBI @DasShaktikanta @SEBI\_Indi*

*3.0*

*Please reunite families @MIB\_India @COVIDNewsByMIB @sonmonib5 @BhallaAjay26 @kishanreddybjp @NITIAayog @CovidIndiaSeva @DrHVoffice @MoHFW\_INDIA @USAmbIndia @drharshvardhan @Harshita0908 ||n@AmankayamHai\_ET @PIBHomeAffairs ||n#OpenUSEmbassyIndia #OpenUSConsulat*

*1.0*

*||"Buddha is not only a name but a sacred thought.A thought that beats in every human heart, guides the humanity.Buddha is ultimate limit of sacrifice and devotion||" ||nPrime Minister @narendramodi in his keynote address at virtual Vesak global celebrations.||n||n #BuddhaPurnima <https://t.co/9ul7wfb3v>*

*5.0*

*Mr. Modi ||u2013 you saved India from Covid. Now please Save Tourism. We have no backup plan, Our companies will die without your support. @narendramodi*

*3.0*

*@sumeetbhasin @narendramodi @tarunchughbjp @Virend\_Sachdeva  
@VikramMittalBjp @nikhil5706 @Hemantrbhardwaj @Idivyaratan @chetanbragta  
@varunpuri1984 @Chetansharmabjp @pankaj\_maphd Congrats!!!!\nWe need a PM  
like @narendramodi for his ability to galvanise the whole system to be people  
friendly. God Bless Shrivastavas and @narendramodi |\n|nJAI  
HIND|\ud83c|\uddee|\ud83c|\uddf3|\ud83c|\uddee|\ud83c|\uddf3|\ud83c|\uddee|\ud83  
c|\uddf*

*11.0*

*Tourism is the key source of revenue and economy for any country. It helps promote  
an understanding of culture, arts, history etc. Bcs of tourism, you have industries like  
aviation, railway, hospitality etc. But still Ignored? #savetourismjobs @FinMinIndia  
@PMOIndia @narendramod*

*4.0*

*@bjpdrmahendra @kpmaurya1 @BJP4India @BJP4UP @BJPLive @narendramodi  
@AmitShah @JPNadda @gssjodhpur @myogiadityanath @MoJSDoWRRDGR  
@JalShaktiAbhyan #UPPSCJE2013 great work si*

*3.0*

*Who will help India?@PMOIndia @narendramodi |\n|\n|\n|\n@PMEthiopia  
@Ethiopia\_UN Hey Ethiopia, can you please ask PM of India to take care of his  
country first.|\nThank you*

*5.0*

*@sambitswaraj @narendramodi Jai hin*

*0.0*

*#YesBank\_AT1\_RetailInvestor @narendramodi @nsitharaman @PMOIndia This is white collar robbery by YB under very noses of @SEBI\_India & @RBI @DasShaktikanta @nsitharamanoffc @aahtak @ndtv @pti\_news @CNBCTV18Live\|nplease R*

*0.0*

*@cbic\_india @FinMinIndia @PMOIndia @ficci\_india\|n@narendramodi @FollowCII \|nGood Afternoon. Thanks for extending date for filing annual return for 18-19. I would like to draw attention that many businesses including MSME remain pending with filing annual return for 17-18 for whic*

*5.0*

*PM Holds Meeting With NDMA Officials Over Vizag Gas Leak \|n\|nRead Here: <https://t.co/UBKRV5dIFd>\|n\|n@PMOIndia / @narendramodi / @AmitShah / @rajnathsingh / #Vishakapatnam / #VizagGasLeak <https://t.co/8FwFSnO4M>*

*-1.0*

*Tourism a major source of income . MOT provided monthly tourism revenue in USD which comes around 40% or generated 9.9% of GDP. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @NITIAayog @tourismgoi @prahladspatel @Official\_IATO @TourismFait*

*0.0*

*@narendramodi Ji, Indian #trade is struggling for survival. #CFSs which is controlled by @cbic\_india continue to not adhere @shipmin\_india @cbic\_india \|u2018s order & force trade\|#importers to pay hefty charges. #6000units fears closure. @PMOIndia we seek ur kind attention & support\|ud83d\|ude4f\|ud83c\|udff*

*-1.0*

*#SaveAdarshCredit* *@narendramodi* *ADARSH credit co-operative society LTD*  
*Ko Regulet kare sar* *PM SAR se nivedan ha*

2.0

*Workers on verge of loosing jobs! Companies can't pay salaries until they get relief. This is turning to pandemic of unemployment Need some relief at the earliest*  
*#savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman*  
*@PiyushGoyal @tourismgoi @iato\_india @TourismFait*

-6.0

*Doctors have given us a lifeline. Tourism needs a Doctor, Tourism needs your help, Don't know how will we feed our families with no work left. #savetourismjobs*  
*@FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal*  
*@NITIAayog @tourismgoi @iato\_india @TourismFait*

0.0

*@RBI @DasShaktikanta You must be feeling pressure of liquidity drying up due to your folly of AT1 decision. @PMOIndia @pk63 @ananthng @rkumar1958*  
*@TheOfficialSBI @nsitharaman @narendramodi @BrigMahalingam*  
*@RanjangogoiRS @PTI\_News @CNBC\_Awaaz #YesBank\_AT1\_RetailInvesto*

-1.0

*@Re\_tweeteer @hindu\_by\_heart @srk7353 @vivekagnihotri @narendramodi Wasn't talking on ur behalf .. that was my expression . Hope someday some research from the pocket will make u understand.. ' kudos' was sarcasm.*

2.0

*@DrSJaishankar @moteging @narendramodi it is a better opportunity. India should ask Japan assistance in the defence sector & hardware, robotic technology. GOI should select the best students In India and send them to Japan. Once they finish training to provide them with a platform to explore*

8.0

*unless we relocate huge number of Ex-Army men and rajputs/Yadavs/Sikhs etc each with a gun and rs 20 L in the valley--the barbarians cant be controlled-- @narendramodi @PMOIndia @AmitShah @rajnathsingh R*

-2.0

*PM @narendramodi has spoken to Andhra Pradesh CM Shri @ysjagan regarding the situation in Visakhapatnam. He assured all help and support*

4.0

*@priyankagandhi @PMOIndia @narendramodi @PiyushGoyal @VTankha Oh .....my God, Save..... Our Country n Humanity*

3.0

*CEA spoke about free lunch. This is not the first time he is sounding arrogant. He is having free lunch out of tax payers money. Hope his view is not reflective of the government's.*

2.0

*Year 1981, when Indian Master Lic was Sailing as 3rd Officer because of World Recession. 2020: Jobs wiped out for Indian Seafarers as Government didn't recognise input by Foreign ship Owners who employ 200,000 Indians every Year. Jobs shifted to other countries.*

-2.0

*Watch PM @narendramodi ji's 2019s keynote address at virtual Vesak global celebrations on Buddha Purnima in honour of the victims and frontline warriors of COVID-19 global pandemic today at 9 am. <https://t.co/j0vDRkFUb>*

2.0

*I have never witnessed slander of a woman in such a vile manner by a vast majority including the top brass SO OPENLY. Not in India, not elsewhere. Much talked about Indian civilisation has literally gone to the dogs. Totally at the end of my rope. <https://t.co/Es7Z5Nlvy>*

-1.0

*We the tourism fraternity of India kindly request Hon'ble PM Shri @narendramodi ji to help with a financial relief package, bcoz of covid19 our industry is suffering a lot, our people are not able to feed our families. We kindly request you to save our industry. @nsitharamanoff*

2.0

*@EKadhirvel @MoHFW\_INDIA @narendramodi @PMOIndia @narendramodi\_in  
Meanwhile: @sambitswaraj is doing what he can do to his best capacity to fight covid19. <https://t.co/hD3XtF6ek>*

2.0

*Our livelihood at stake, urgent intervention needed,.SOS, Save Indian Tourism, Save Jobs. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

3.0

*Punish the woman who allegedly beat a pregnant stray dog until she and her puppies died. #Justiceforapril #helpstreetdog @narendramodi @mygiadityanath  
<https://t.co/gZXwpnQXO>*

*-5.0*

*#OpenUSConsulate ||n#OpenUSEmbassyIndia ||n||nPlease find a way for visa stamping, and help us reunite with our family.||n@VFSGlobal @USAndIndia @narendramodi @AmitSha*

*2.0*

*Modi Ji please help us navigate through these tough crossroads. Tourism businesses will have longer recovery. Help save our jobs and future #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

*7.0*

*#Gamcha, basically a soft towel made of cotton is a very handy piece of cloth. It can easily be used as a mufler, mask , turban,shawl & even a sheet for sleeping. Thanks to @narendramodi ji that it is back in use even in urban India. I pulled mine from wardrobe yesterday <https://t.co/Vt7MXwzuo>*

*2.0*

*#IndiaFightsCorona:||n||nPM @narendramodi praises International Buddhist organization for organizing a virtual Vesak Buddha Purnima Day in these difficult circumstances of lockdown. ||n||nText of PM||u2019s Speech on the occasion of Vesak-Buddha Purnima:||n<https://t.co/5W3bosBNYE>||n||n#StayAtHom*

*2.0*



*@PMOIndia @Nidhi @narendramodi More opportunities for ripping funds from citizen*

*2.0*

*@pk63 @YESBANK Straight forward denial of mis-selling allegations by #YesBank\_AT1\_RetailInvestor is uncalled for. Please live up to your promise of investigation into this. So many investors cannot lie about||/allege the same thing. @rkumar1958 @RBI @narendramodi @nsitharama*

*-1.0*

*.@urbandictionary You cannot degrade PM of India @narendramodi ji on your platform by spreading such filthy meanings about him||n||nTake this as a WARNING to you before we proceed for legal actions||n||nWe Immidiately want an Apologies&this taken off your platform and things be corrected <https://t.co/zYRqUWC4P>*

*-4.0*

*70% Tourism Industry jobs will go in the next 60 days. Please help the industry now. We have no business for the next 12 months! #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFaith @VinodChavdaBJ*

*2.0*

*@MutilatedDreams @srivatsayb Pls stop saying GOVERNMENT. ||n||nThe buck stops at @narendramodi @narendramodi\_in ||n@PMOIndia ||n||nAnd his silence is purely bcos all this has nothing to do with his agenda.||n||nShame on the people for voting him to power*

*-2.0*

*@VinayDokania @narendramodi Best PM in world...Handled Media very smart!*

*3.0*

*OUR FRIEND DIED\\nHELP #VIZAG\\n#VizagGasLeak\\nPLS TAKE ACTION  
@ysjagan @narendramodi @JanaSenaParty @PawanKalyan  
<https://t.co/Mk4zNjLKI>*

*-2.0*

*@TimesNow @narendramodi @kishanreddybjp We noticed CMs have also asked for immediate funding. Has all that also been given in full*

*0.0*

*Please take note of old precedents of saving AT1 bonds of other banks. Please don't do this step motherly treatment with @YESBANK AT1 bonds. Save us!  
#YesBank\_AT1\_RetailInvestor @RBI @DasShaktikanta @FinMinIndia  
@nsitharaman @PMOIndia @narendramodi @pk63 @PTI\_News @CNBCTV18Liv*

*6.0*

*Sir, I am from Saharsa, Bihar. My father is in Nepal (Dharan). He wants to come home, but due to lockdown he is unable to come. There are no essential facilities provided by the Nepal government. Please help them. @narendramodi @PMOIndia @DrSJaishankar @NitishKumar @SushilMod*

*1.0*

*When we said that we will seek police help he said that I sponsor the police and I am part of @BJP4Karnataka @BJPindia\_\_ @PMOIndia @narendramodi\\nHe even said us refugees. Said you are not in refugee camps*

*2.0*

*PM @narendramodi has spoken to Andhra Pradesh CM Shri @ysjagan regarding the situation in Visakhapatnam. He assured all help and support*

*4.0*

*In the wake of the situation in Visakhapatnam, PM @narendramodi has called for a meeting of the NDMA at 11 AM*

*0.0*

*#SaveAdarshCredit @aajtak @AmitShah @narendramodi @PMOIndia please solve the Adarsh credit matter... Please solve this like YES bank and PMC bank matter solved by government*

*9.0*

*It is complete carelessness of #LGPolymer and #AP government serious investigation needs to be done by central government even AP govt escaped from papikondalu boat mishap.. @narendramodi @AmitShah @HMOIndia @PawanKalyan #Vizag #VizagGasLeak #VizagGasTraged*

*-1.0*

*70% Tourism Industry jobs will go in the next 60 days. Please help the industry now. We have no business for the next 12 months! #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

*2.0*

*@PMOIndia @narendramodi Modi ji, How U associate urself with Budha, when U did not follow his path in 2018? Pls renotify 2018 amended gratuity act effective from 01/12/2016 & prove U R also not limited to one context*

*2.0*

*@narendramodi We should add these types of machines guns on helicopters and provide assistance in Jammu Kashmir. As in other countries even for a small chase they use helicopters to track them down <https://t.co/rHdRnqBKq>*

*-1.0*

*@bjpdrmahendra @myogiadityanath @BJP4India @BJPLive @BJP4UP @narendramodi @AmitShah @gssjodhpur @OfficeOfGSS @MoJSDoWRRDGR @JalShaktiAbhyan During this dreadful time we are along with Nation and humanity. We the final selected candidates of #UPPSCJE2013 irrigation dept are waiting since last 7 years, Now this is the right time to serve for the nation, kindly proceed our joining process. @UPGovt @bjpdrmahendra @PMOIndi*

*-2.0*

*#YesBank\_AT1\_RetailInvestor @RBI @narendramodi @nsitharaman @PMOIndia Auditors have also clearly outlined that the government Gazette excluded AT1 write-offs- please help #YesBank\_AT1\_RetailInvestor @DasShaktikanta @nsitharamanoffc @ndtv @pti\_news @CNBCTV18Live @ShereenBha*

*3.0*

*In the wake of the situation in Visakhapatnam, PM @narendramodi has called for a meeting of the NDMA at 11 AM*

*0.0*

*Mr. Modi you saved India from Covid. Now please Save Tourism. We have no backup plan, Our companies will die without your support. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

*3.0*

*On the auspicious occasion of #BuddhaPurnima, Hon @PMOIndia @narendramodi ji reinstated Buddha's teachings, asking us to inculcate it in our lives, as we fight the #Pandemic #Covid\_19!||n||nIndia stands firmly with each one, around the globe, in distress*

*-3.0*

*#OpenUSConsulate ||n#OpenUSEmbassyIndia ||n||nPlease find a way for visa stamping, and help us reunite with our family.||n@VFSGlobal @USAndIndia @narendramodi @AmitSha*

*2.0*

*#YesBank\_AT1\_RetailInvestor @RBI @narendramodi @nsitharaman @PMOIndia Auditors have also clearly outlined that the government Gazette excluded AT1 write-offs- please help #YesBank\_AT1\_RetailInvestor||n@DasShaktikanta @nsitharamanoffc @aajtak @ndtv @pti\_news @CNBCTV18Liv*

*3.0*

*It's a pleasure to be amongst you, but the situation doesn't permit us. Even during this critical situation of a lockdown, the International Buddhist Confederation deserves praise for organising this virtual celebration of Buddha Purnima: PM Shri @narendramodi ji . <https://t.co/IB6xJfls5>*

*9.0*

*Plzz @MoHFW\_INDIA||n @drharshvardhan ||n@PMOIndia ||n@narendramodi ||n@AmitShah ||n@ramsinghjajim8 @isonu8722 ||nLook into the matter||ud83d||ude4f||nContract nursing officers ko parmanent karne ki babat m||ud83d||udc47||ud83d||udc47 <https://t.co/885uwt3pJ>*

*1.0*

*70% Tourism Industry jobs will go in the next 60 days. Please help the industry now. We have no business for the next 12 months! #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

2.0

*@LrdJustice @PMOIndia @narendramodi @AmitShah @CMOGuj @vijayrupanibjp @Nitinbhai\_Patel @PradipsinhGuj @BJP4Gujarat @INCGujarat @paresh\_dhanani @Zee24Kalak @ABPNews @GSTV\_NEWS @tv9gujarati @VtvGujarati @DDNewsGujarati @News18Guj @ddgirnarlive @sandeshnews @BJP4India @INCIndia @RahulGandhi Justice lrd mal*

2.0

*@VvekTyagi @AmitShah @AmitShahOffice @PMOIndia @narendramodi @rajnathsingh Govt sleeping*

0.0

*@FlagsOfHonour @Ptr6Vb @Chopsyturvey @SinghNavdeep @atahasnain53 @BahadurManmohan @rashtrapatibhvn @narendramodi @rajeev\_mp @adgpi In our course, during Ex Golden Key, we also had near fatal accidents. Our condolences & sympathies. Om Shanti*

-3.0

*Mr. Modi you saved India from Covid. Now please Save Tourism. We have no backup plan, Our companies will die without your support. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

3.0

*Modi Ji, Our livelihood at stake, urgent intervention needed,.SOS, Save Indian Tourism, Save Jobs. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

**3.0**

*#YesBank\_AT1\_RetailInvestor @RBI @narendramodi @nsitharaman @PMOIndia This 2000+ crore is twice the money bank owes to us which were missold. There's every reason for us to feel shortchanged@DasShaktikanta @nsitharamanoffc @aajtak @ndtv @pti\_news @CNBCTV18Liv*

**0.0**

*##SaveIndianTourism #savetourismjobs||nHumble request to Govt. of India PM||n@narendramodi ||n@nsitharaman||n@tourismgoi||n@iato\_india||n please announce survival measures #reliefpackage for tourism industr*

**1.0**

*Modi Ji please help us navigate through these tough crossroads. Tourism businesses will have longer recovery. Help save our jobs and future #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

**7.0**

*I had an excellent conversation today with @narendramodi, whom I congratulated on the good results achieved in containing the pandemic in a country as large and populous as #India. We shared information on the management of the pandemic and reflected on the post-#COVID19 world*

**9.0**

**@DJashapara @narendramodi @BorisJohnson @BobBlackman @nytimes @DVATW @Mahna5G @abhikyogi @Nanm @LADHIT2 @naomi2009 OMG INDIA!:** *Humanity Rise & Shine! Difficult times - CORONA! For let's UNITE - Forget politics foronce! Indulge in Yogic & Ayurvedic practices & add LIKE, RT + COMMENTS!! I am illustrating SITTING POSITIONS & ||"YOGIC BANDHA||". TRANSFORM YOUR LIVES VIA ||"KAYA-KALP! Await next one!* <https://t.co/1Af3hTPBa>

**0.0**

*Uncertainty in Tourism. No business for next 12 months. No job security. Companies helpless. Financial support needed to survive #savetourismjobs @nitin\_gadkari @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @tourismgoi @iato\_india @TourismFait*

**-2.0**

**@BSYBJP @nimmaresh @PrakashJavdekar @narendramodi** *The fees for the schools needs immediate attention from your esteemed leadership as we are already paying fees that are many times more than the national standards (a fees for more than 1.3 lakhs for primary school)*

**2.0**

**#YesBank\_AT1\_RetailInvestor @RBI @narendramodi @nsitharaman @PMOIndia** *after wrecking havoc on the #YesBank\_AT1\_RetailInvestor by writing their holdings off and subsuming towards shameless profiteering||n @DasShaktikanta @nsitharamanoffc @ajtak @ndtv @pti\_news @CNBCTV18Liv*

**-4.0**



*Modi Ji, Our livelihood at stake, urgent intervention needed,.SOS, Save Indian Tourism, Save Jobs. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

*3.0*

*@narendramodi @PMOIndia @ravishndtv||ni want a respectable salary... i want cpc for banke*

*2.0*

*I have never witnessed slander of a woman in such a vile manner by a vast majority including the top brass SO OPENLY. Not in India, not elsewhere. Much talked about Indian civilisation has literally gone to the dogs. Totally at the end of my rope. <https://t.co/Es7Z5Nlvy>*

*-1.0*

*PM @narendramodi has spoken to Andhra Pradesh CM Shri @ysjagan regarding the situation in Visakhapatnam. He assured all help and support*

*4.0*

*70% Tourism Industry jobs will go in the next 60 days. Please help the industry now. We have no business for the next 12 months! #savetourismjobs @FinMinIndia @PMOIndia @narendramodi*

*2.0*

*||'Amnesty International has finally confirmed the massacre of Hindus by Rohingya Muslims even as Indian ||u2018liberals||u2019 tried to whitewash their crimes.||'|n||n#HinduLivesMatter #Hinduphobia  
#Amnesty||n||n<https://t.co/eARH3h7UZ>*

*-6.0*

*@RMCpost @AmitShah @narendramodi @rajshekhartOI Permanent solution? Then what will @sambitswaraj & @amitmalviya do? With what they will whine on Channel debates????*

*1.0*

*@MoCA\_GoI @narendramodi @PMOIndia @ushapadhee1996 @HardeepSPuri @AAI\_Official @PawanHansLtd @PIB\_India @airindiain @PTI\_News There are no to and from flights from Goa. What kind of evacuation is this?Your eligibility criteria misses out so many points. We are just asking to open outbound international flights for a few days to allow us to leave*

*-2.0*

*#YesBank\_ATI\_RetailInvestor @narendramodi @nsitharaman Great to see a Yes Bank a private entity making profits, Government pocketing 2000+ cr taxes, 'strategic' investors making profits in a fortnight*  
*@DasShaktikanta @nsitharamanoffc @aajtak @ndtv @pti\_news @CNBCTV18Liv*

*8.0*

*@BhollaChandan @narendramodi register on @HCI\_Ottawa who want to come from Canada*

*1.0*

*In the wake of the situation in Visakhapatnam, PM @narendramodi has called for a meeting of the NDMA at 11 AM*

*0.0*

*@rashtrapatibhvn @VPSecretariat @BSKoshyari @narendramodi Before it get late kindly look after maharastra specially ||"mumbai||" the condtion is critical here,theres no space in hospitals now for patient, what will be our future no one knows here after +ve\'s cases rising day by day*

*-1.0*

*Please open us consulates and start processing 221g.||n#OpenUSEmbassyIndia||n#OpenUSConsulate. ||n @MIB\_India @COVIDNewsByMIB @sonmonib5 @BhallaAjay26 @kishanreddybjp @DrHVoffice @MoHFW\_INDIA @drharshvardhan @Harshita0908 ||n@AmankayamHai\_ET @PIBHomeAffairs @bkhulbe ||n @Secretary\_Mo*

*1.0*

*PM @narendramodi has spoken to Andhra Pradesh CM Shri @ysjagan regarding the situation in Visakhapatnam. He assured all help and support*

*4.0*

*70% Tourism Industry jobs will go in the next 60 days. Please help the industry now. We have no business for the next 12 months! #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

*2.0*

*India has:||n||n||ud83d||udc49Saved ||u20b989,122 Cr||n||n||ud83d||udc49Reduced 151.74 Million Tonnes of CO2||n||nIn 2018-19.||n||nDue to Various Energy Efficiency Measures.||n||nWell done @narendramodi sir!||n||n@AmitShah @JPNadda*

*0.0*

*Mr. Modi ||u2013 you saved India from Covid. Now please Save Tourism. We have no backup plan, Our companies will die without your support. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

3.0

*@dpradhanbjp @narendramodi great si*

3.0

*@HariomRastogie @satyam21997 @narendramodi @PMOIndia Yes that's my point action must be taken against these factories ... against these tycoons who just wanna make money by putting someone's life in danger ...so i think i made my point clear boss...have a good day !!*

3.0

*Modi Ji, Our livelihood at stake, urgent intervention needed,.SOS, Save Indian Tourism, Save Jobs. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

3.0

*@narendramodi @im\_kcr @RajKSinghIndia @TelanganaCMO @AIPEFINDIA||nPower Engineers express hearty gratitude towards Telangana CM KCR for boldly opposing Electy Amendment Bill 2020 in larger interest of farmers,common consumers,power employees & utilities.@AIPEF||n#SavePowerSectorIndi*

3.0

*Covid-19 has hit the Indian tourism industry hard. Need support. Need some relief at the earliest #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @tourismgoi @iato\_india @TourismFait*

*1.0*

*Modi Ji please help us navigate through these tough crossroads. Tourism businesses will have longer recovery. Help save our jobs and future #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

*7.0*

*In one side COVID-19 outbreak affected whole world, lockdown- 1.0,2.0,3.0. Passing away of two of the most precious gems of our country Irrfan sir and Rishi sir. Now today. Vizag gas leak occurred. mWhat is left to see more in 2020. Stay home Stay Safe. ||ud83d||ude4f||n#VizagGasLeak ||n@narendramod*

*0.0*

*PM @narendramodi has spoken to Andhra Pradesh CM Shri @ysjagan regarding the situation in Visakhapatnam. He assured all help and support*

*4.0*

*Modi Ji, Our livelihood at stake, urgent intervention needed,.SOS, Save Indian Tourism, Save Jobs. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

*3.0*

*9.2% of GDP \|\ 8.1% of total employment - 42.6 millions jobs - is tourism contribution to our economy. How can we be overlooked? Help us help India #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

*4.0*

*@BDUTT Disturbing \|\ud83d\ude14... @narendramod*

*-2.0*

*@AshwiniBJP @narendramodi @AmitShah This is wht these Jihadis r doing in INDIA to convert INDIA in to an ISIS state(GAJVA E HIND) since centuries.yet they play #VictimJihad muslim victim card Strategy to hide thr terrorism to defame Hindus nd Modi government in frnt of the whole world*

*-4.0*

*PM @narendramodi has spoken to Andhra Pradesh CM Shri @ysjagan regarding the situation in Visakhapatnam. He assured all help and support*

*4.0*

*Please help the Tourism industry now. We have no business for the next 12 months! #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

*2.0*

*Modi Ji, Our livelihood at stake, urgent intervention needed,.SOS, Save Indian Tourism, Save Jobs. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

*3.0*

*Modi Ji, Tourism industry is bleeding. Please help us revive. #savetourismjobs  
@FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal  
@NITIAayog @tourismgoi @iato\_india @TourismFaith @EPSTamilNadu  
@NNatarajanoff*

*5.0*

*#SaveAdarshCredit\n@PMOIndia @narendramodi\nRespected PM sir, \nPlease  
feel the pain of all 21 lakh investors who credited their money but now they are unable  
to get their money since last 2years. my request to you sir to give your attention of this  
too please*

*-3.0*

*I have never witnessed slander of a woman in such a vile manner by a vast majority  
including the top brass SO OPENLY. Not in India, not elsewhere. Much talked about  
Indian civilisation has literally gone to the dogs. Totally at the end of my rope.  
<https://t.co/Es7Z5Nlvy>*

*-1.0*

*#savetourismjobs We request our government to give bailout financial package to  
defray the salaries of the employees  
\n@iato\_india\n@TourismFaith\n@FinMinIndia\n@tourismgoi\n@PMOIndia\n@narendramodi\n@nitin\_gadkari\n@PiyushGoya*

*-2.0*

*All speeches of @NarendraModi are now boring... He imagines hes some spiritual  
leader speaking from his cave in the Himalayas.. Nobody wants Morari Bapu  
speeches... We have many other Gurus doing that.. These speeches are now boring  
& with ZERO substance.. <https://t.co/gNCAuPme8>*

*-4.0*

*Mr. Modi ||u2013 you saved India from Covid. Now please Save Tourism. We have no backup plan, Our companies will die without your support. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFaith @EPSTamilNadu <https://t.co/cbWQNsDNU>*

3.0

*Watch PM @narendramodi ji||u2019s keynote address at virtual Vesak global celebrations on Buddha Purnima in honour of the victims and frontline warriors of COVID-19 global pandemic today at 9 am. ||n||n<https://t.co/j0vDRkFUb>*

2.0

*Exams are one of good ways to test our sincerity and knowledge. KIIT has distinction of conducting online examinations for the students with complete invigilation. #KIITatHome ||n@CMO\_Odisha||n ||n@KIITUniversity||n ||n@KISSFoundation||n ||n@HRDMinistry||n ||n@narendramod*

5.0

*#SaveAdarshCredit @narendramodi @AmitShah It is our humble request please save our Adarsh society. It is your duty to save the poor people||u2019s life. It||u2019s very difficult them to survive without Adarsh. We donot only want deposits,we also wants our services. Please restart our Adars*

6.0

*Geared up to Tackle COVID-19 ||u26d1||ufe0f: In line with PM @NarendraModi ji's determination to provide healthcare in every corner of the nation, Special Isolation Coaches prepared by Railways will be placed at 215 Railway Stations across 23 states & UTs for use as COVID-19 Care Centres*

2.0



*Modi Ji, Our livelihood at stake, urgent intervention needed,.SOS, Save Indian Tourism, Save Jobs. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

3.0

*Watch PM @narendramodi ji's 2019s keynote address at virtual Vesak global celebrations on Buddha Purnima in honour of the victims and frontline warriors of COVID-19 global pandemic today at 9 am. |n|nhttps://t.co/j0vDRkFUb*

2.0

*Our livelihood at stake, urgent intervention needed,.SOS, Save Indian Tourism, Save Jobs. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

3.0

*Modi Ji please help us navigate through these tough crossroads. Tourism businesses will have longer recovery. Help save our jobs and future #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

7.0

*@narendramodi Great presentatio*

3.0

*Respected Modi Ji, Joblessness is leading to hopelessness..Urgently seek your support, Save tourism and save jobs. #savetourismjobs @FinMinIndia @PMOIndia @narendramodi @nsitharaman @PiyushGoyal @NITIAayog @tourismgoi @iato\_india @TourismFait*

6.0

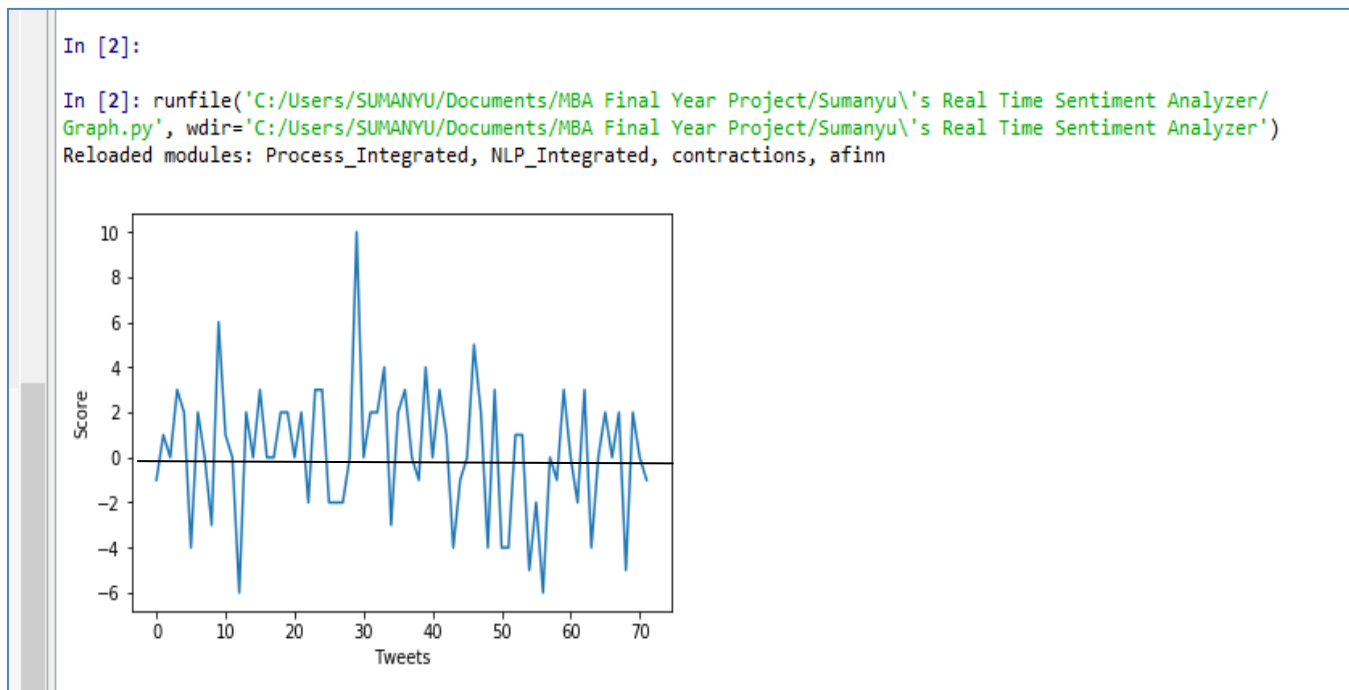
## CHAPTER 5

### FINDINGS & INTERPRETATION

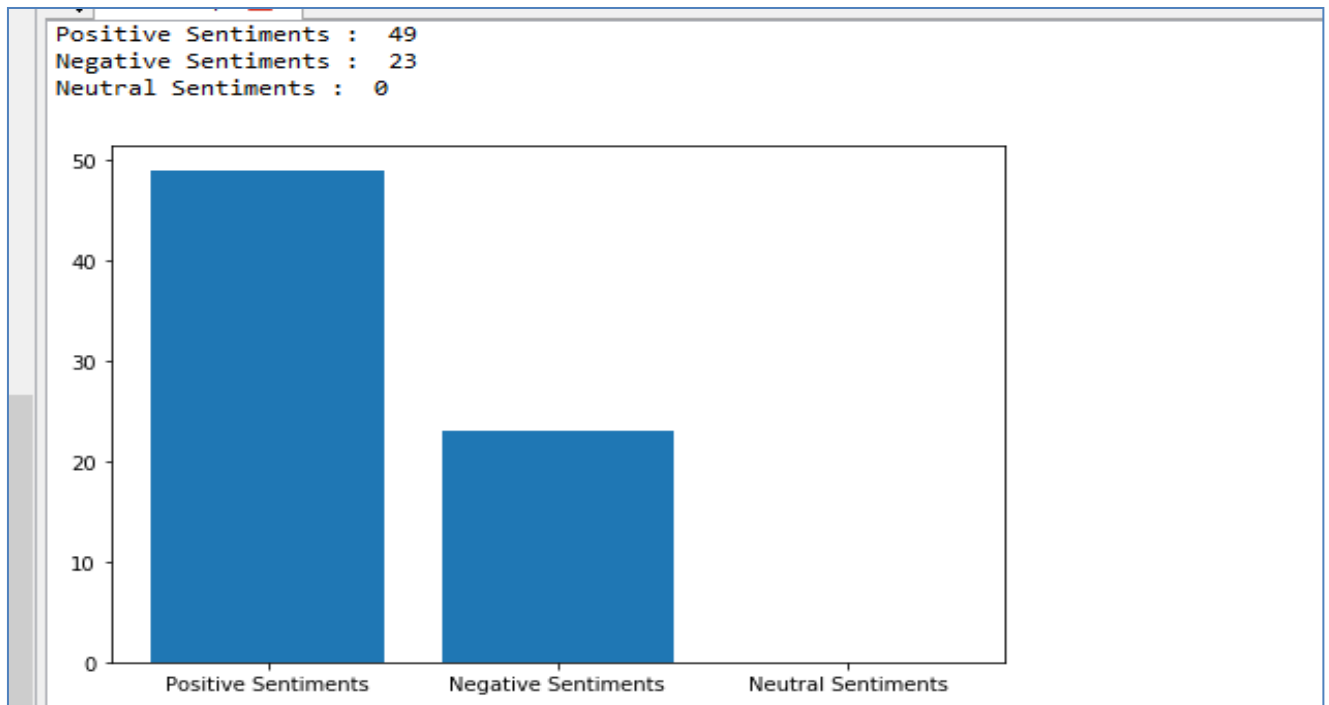
DATA RECORDED FOR EACH OF THE BELOW STRINGS FOR ONLY 5 MINUTES

CASE- 1: Persons

CASE- 1.1: Narendra Modi, Prime Minister, Real Time Twitter® Sentiment analysis



**Graph 5.1** Line Plot of *Narendra Modi*



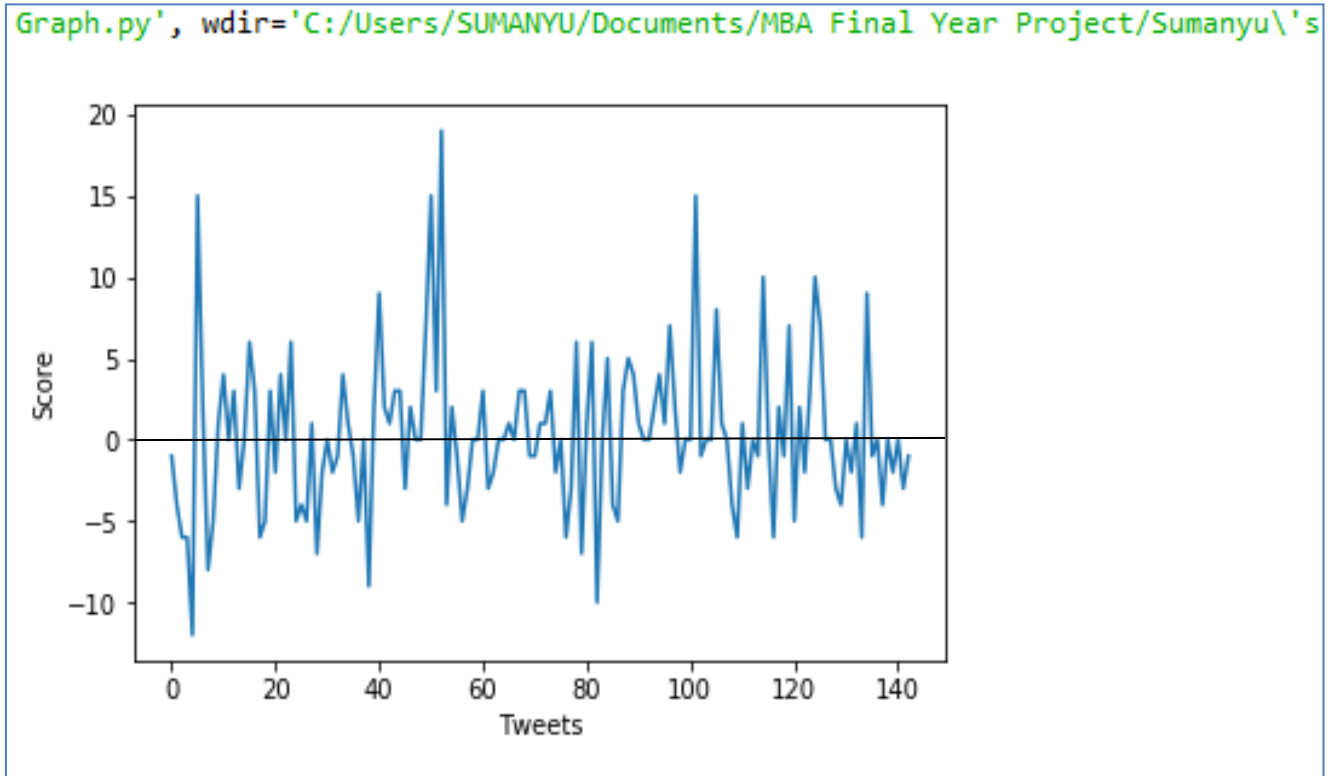
**Graph 5.2** Bar Graph of *Narendra Modi*

So ,to interpret , in the above Graph 5.1 & 5.2 , most of the tweets of PM Narendra Modi on 26th April 2020, are recorded as positive , ranging from + 0 to + 3 and very few were recorded as negative tweets. 0 Neutral sentiments were seen. To observe in Graph 5.1 Line Graph , maximum positive score is + 10 and maximum negative score is- 6.

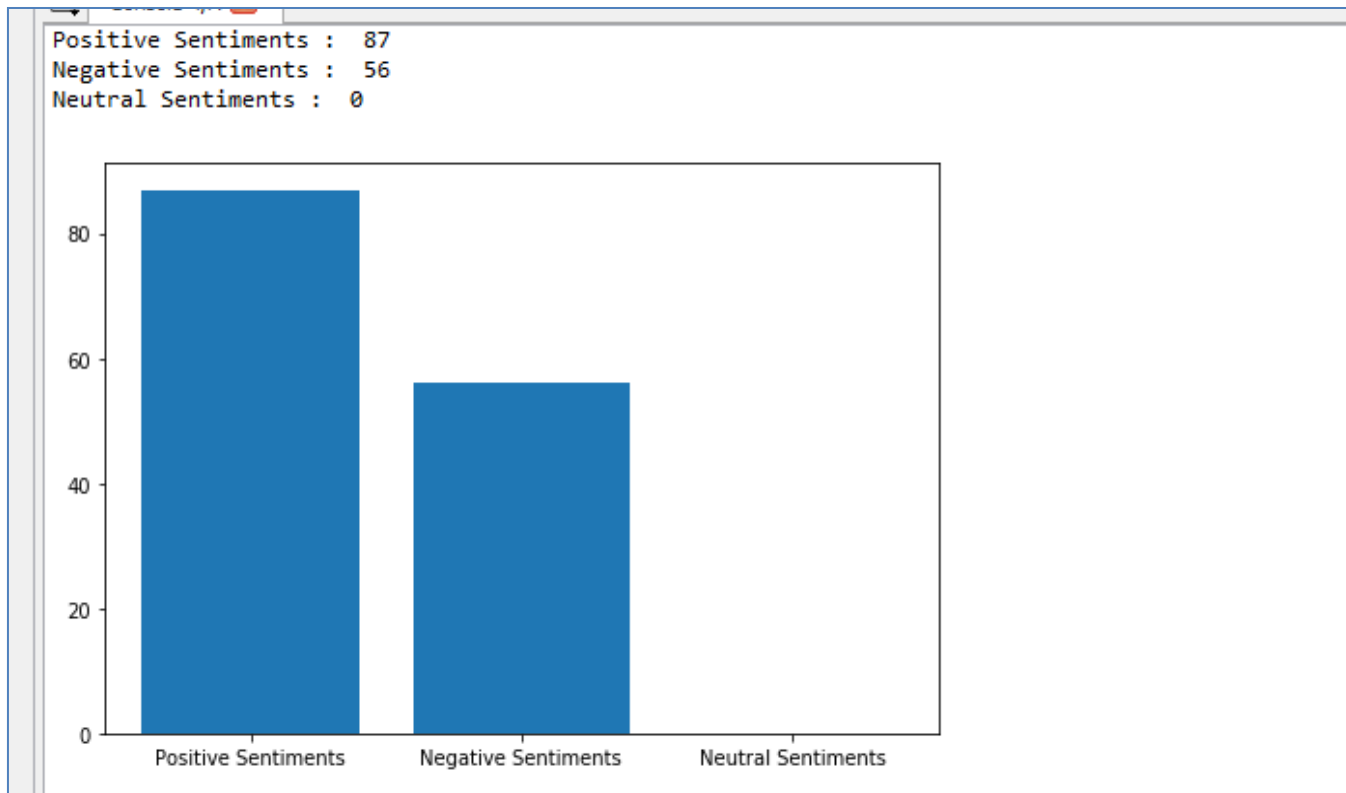
In Graph 5.2 , bar graph of Narendra Modi , it is clearly seen that count of positive sentiments are greater than negative sentiments leading to 49 compared with 23 negative sentiments.

Overall , observing the results of 73 scores the subjectivity & polarity of Narendra Modi, Prime Minister, as above , his personality & work is satisfying his nationals.

CASE- 1.2 : Donald Trump, President of USA , Real Time Twitter® Sentiment analysis.



**Graph 5.3** Line Plot of *Donald Trump*



**Graph 5.4** Bar Graph of *Donald Trump*

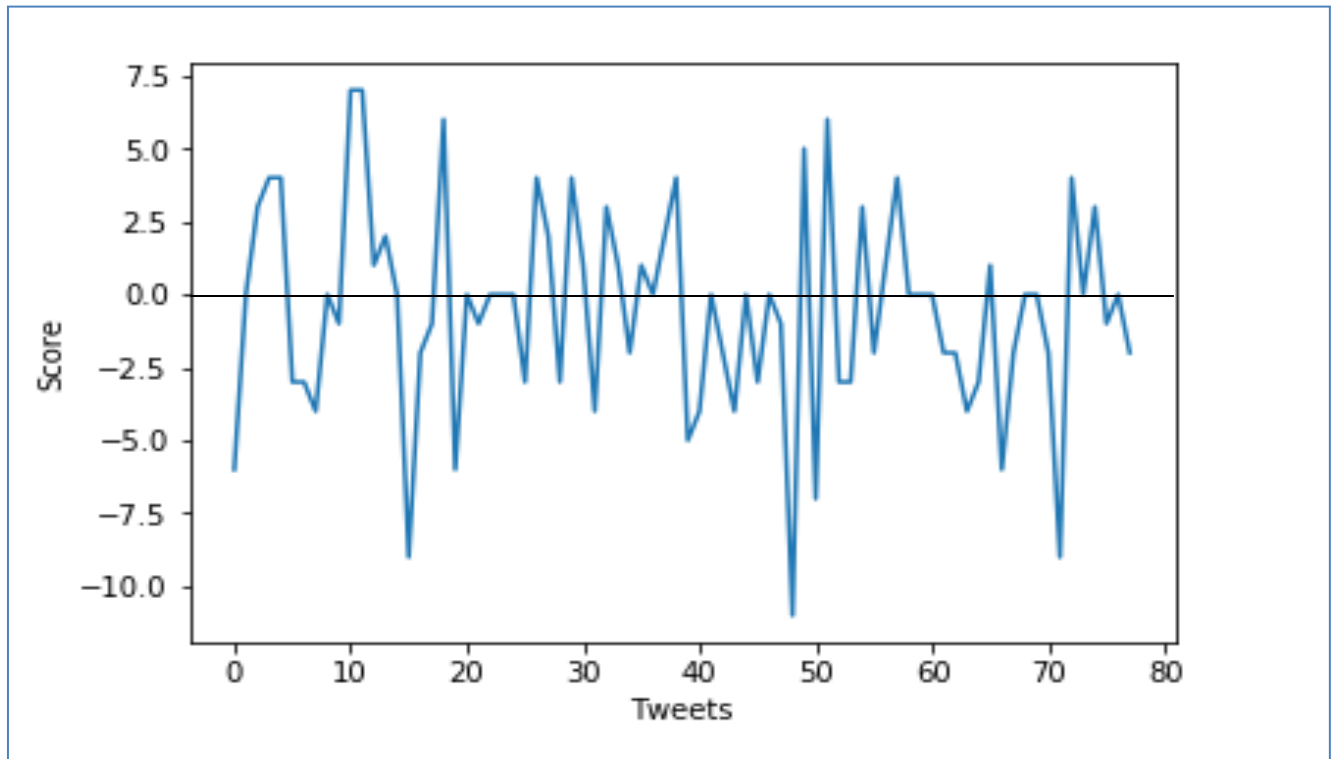
So, to interpret, in the above above Graph 5.3 & 5.4, most of the tweets of President Donald Trump on 26th April 2020, were recorded as positive, counted as 87, ranging from + 0 to + 5 and 56 were recorded as negative tweets. Maximum positive score is + 19 and maximum negative score is - 12.

In graph 5.3 Line Plot, the strength of the polarity have touched nearby high extreme limits in few tweets during the time.

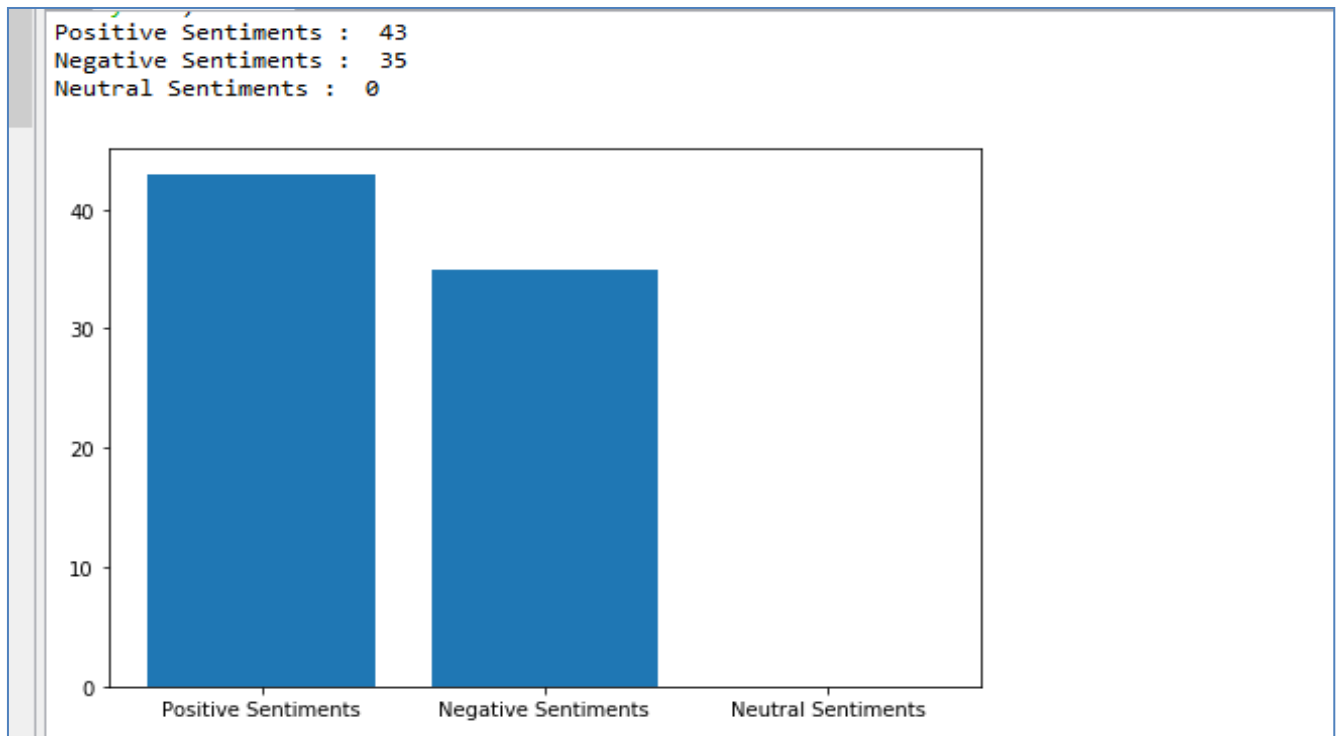
Overall, observing the results of 143 scores, the subjectivity & polarity of the Donald Trump above, it can be concluded that he has a positive attitude in his country for his efforts.

CASE- 2: Virus

CASE- 2.1: Real Time Twitter® Sentiment analysis of Covid-19



**Graph 5.5** Line Plot of Covid-19



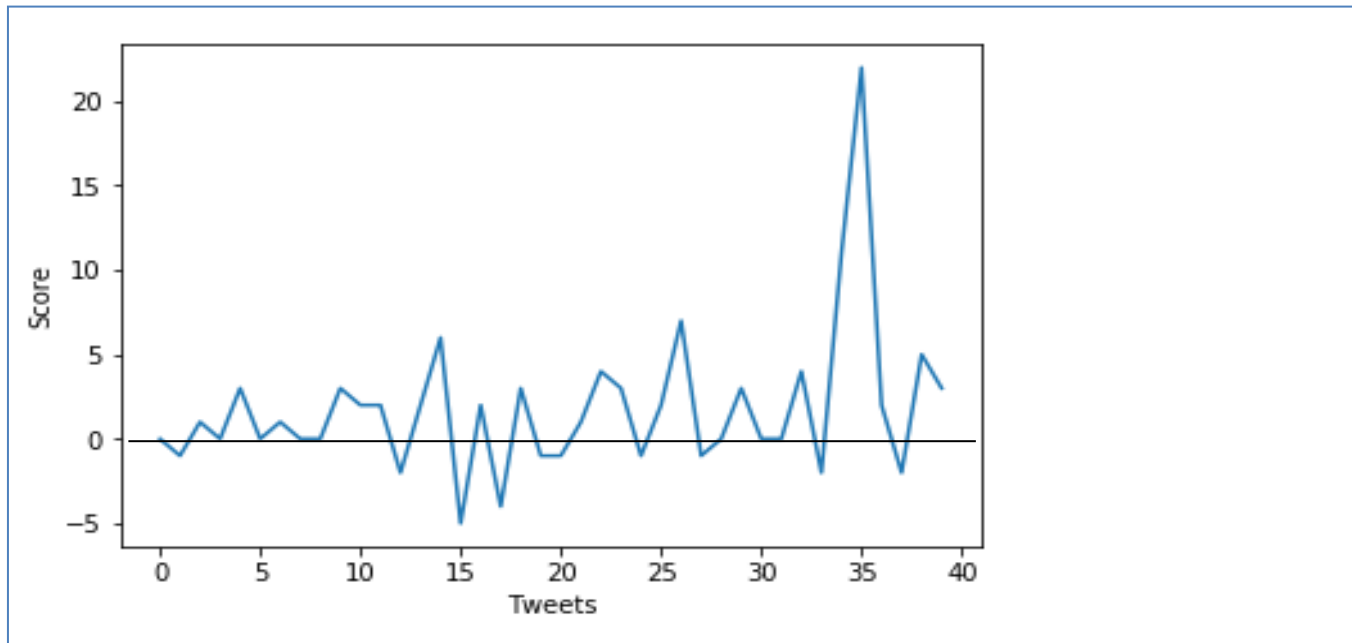
**Graph 5.6** Bar Graph of Covid-19

So ,to interpret , in the above above Graph 5.4 & 5.6 , 43 tweets regarding covid19 on 26th April 2020, were recorded as positive , ranging from + 0 to + 7 and 35 were recorded as negative tweets. Maximum positive score was + 7 and maximum negative score was -11 .

Overall , observing the results of 78 scores, the subjectivity & polarity of covid19 above, it can be concluded that negative and positive sentiments , does not have much of a difference and people are happy regarding various medicines and techniques being used by doctors in order to control the situation and the government steps for the situation.

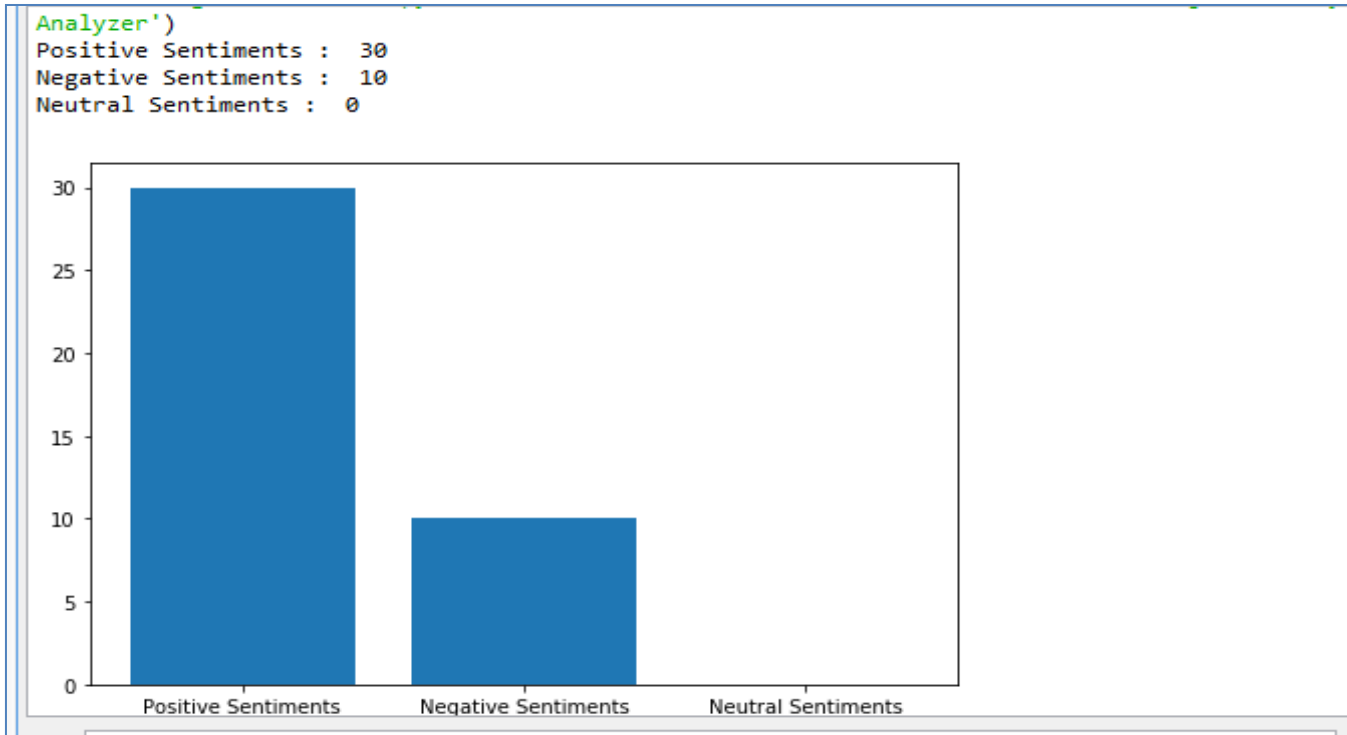
CASE- 3: E Commerce

CASE- 3.1: Real Time Twitter® Sentiment analysis of Amazon



**Graph 5.7** Line Plot of Amazon





**Graph 5.8** Bar Graph of Amazon

So ,to interpret , in the above Graph 5.7 & 5.8, 30 tweets regarding Amazon on 26th April 2020, were recorded as positive and only 10 were recorded as negative tweets. Maximum positive score is above + 20 and maximum negative score is - 4.

Overall , observing the results of 40 scores, the subjectivity & polarity of Amazon above, it can be concluded Amazon is doing quite well in the market in delivery and product variances and even have good services and appearances among consumers.

## CHAPTER 6

### LIMITATIONS OF THE STUDY

One has to extract a huge text of information when analyzing in understand the feeling of the content.

Misrepresentations , mockery and incongruity, refutations, jokes, emojis and the sorts of things an individual would experience little difficulty distinguishing.

Opinions are based on individual perceptions.

Consumers thinking towards a brand or item of its choice gets affected by at least one level of usage and it causes , somebody may have a terrible day and tweet a pessimistic comment about something they in any case have felt.

To summarize , exceptions are weakened if analyzing overall . Predictions are likely to change after some depending on individuals state of mind at that time and as per global scenarios. So, the perceptions and views of one gets change as per the time and nearby surrounding and experience.

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- <https://developer.twitter.com/en>
- <https://towardsdatascience.com>
- <https://www.geeksforgeeks.org>
- <https://www.wikipedia.org>
- [http://corpustext.com/reference/sentiment\\_afinn.html](http://corpustext.com/reference/sentiment_afinn.html)
- International Journal of Scientific and Research Publications, Volume 5, Issue 4, April 2015 1 ISSN 2250-3153 [www.ijsrp.org](http://www.ijsrp.org)
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- Mostafa, M.M. (2013) ‘More than words: Social networks’ text mining for consumer brand sentiments’, Expert Systems with Applications, Vol. 40, No. 10, pp.4241–4251.
- <https://getthematic.com/insights/sentiment-analysis/> , is the image used in Chapter 1 .

## ANNEXURE

### Part A

- C:\Users\SUMANYU\Documents\MBA Final Year Project\Sumanyu's Real Time Sentiment Analyzer\contractions
- C:\Users\SUMANYU\Documents\MBA Final Year Project\Sumanyu's Real Time Sentiment Analyzer\afinn-master\afinn\data
- C:\Users\SUMANYU\Documents\MBA Final Year Project\Sumanyu's Real Time Sentiment Analyzer\Scores.txt : Mentioned in Results section above.
- C:\Users\SUMANYU\Documents\MBA Final Year Project\Sumanyu's Real Time Sentiment Analyzer\Tweets.txt - Mentioned in Results section above

### Part B

- Code
-  C:\Users\SUMANYU\Documents\MBA Final Year Project\Sumanyu's Real Time Sentiment Analyzer\Sentiment.py

# PLAGIARISM CHECK

## ANALYZING THE POLARITY & SUBJECTIVITY OF THE REAL TIME UNSTRUCTURED DATA USING NLP

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