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Twitter User Profile Analyzer

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Abstract— Twitter is the most requested microblog site with 336million active users. On Twitter, users can instantly express ideas, emotions and reactions with tweets. Data coming from twitter is fast and effective responsescanbeobtained,whichcanbeusedin political, social and economic areas. It is possible to analyze the characteristics, trends and behaviors of the users by revealing their interaction. In this study, a brief description of methodology used to analyze the Twitter account/Profile of an individual based on the tweets tweeted by user along with sentiment analysisofthesameispresented.Twitterprofile analysis by parsing the tweets fetched from Twitter using Python isdiscussed.

Keywords— Twitter, Profile Analysis, Python, Sentiment Analysis, social media

I. INTRODUCTION

During these last few decades, Twitter rapidlybecametheleaderofmicrobloggingplatformson the web. Each Twitter user can send messages of less than one hundred and forty characters, called tweets, to a list of volunteer contacts called followers. These users can also receive a list of messages produced by a set of individuals called followers. A huge amount of tweets arepublishedandstoredeachsecondonthemainTwitter database. The density of exchanges on the platform is one of the major challenges when one wants to analyze theprofilesandtheirtweets.Wefocusedonuser'sprofile information changes and analyzeit.

This paper provides individuals a means of creating a persona of an individual based on his Twitter profile. Social media have received more attention nowadays. Public and private opinion about a wide variety of subjectsareexpressedandspreadcontinuallyviaseveral social media. Individuals all over the world, including celebrities and important personalities of all fieldsuse the microblogging social media platform Twitter. We aimtoanalyzeusers,theirtweetstrategies,tweetcontent and popularity of the tweets of their Twitter accounts with sentiment analysis of their tweets .Sentiment Analysis also known as *Opinion Mining* is a fieldwithin Natural Language Processing (NLP) that builds systems that try to identify and extract opinions within text[1]. Usually, besides identifying the opinion, these systems extract attributes of the expressione.g.:

- *Polarity*: if the speaker express a*positive* or *negative*opinion,
- *Subject*: the thing that is being talkedabout,
- *Opinion holder*: the person, or entity that expresses theopinion.

This analysis is required for three domains:

(1) **Business:**Inthemarketingfield,companiesuse it to develop their strategies, to understandcustomers' sentiments towards their products or brand, how peoplerespondtotheircampaignsorproductlaunches and why consumers don't buy someproducts.

(2) **Politics:** In political field, it is used to keep track of political view, to detect consistency and inconsistency between statements and actions at the government level. It can be used to predict election result as well.

(3) **Publicactions:**Sentimentanalysisisalsoused tomonitorandanalyzesocialphenomena,forspotting social threatening situations and determining the general mood of the blogosphere. This is done by using the python Twitter API , called tweepy along with other powerful and useful libraries ofPython.

Challenges in Sentiment analysis:

1. Context AndPolarity

One of the problems that arise from context is changes in polarity[5]. Look at the following responses to a survey:

Everything of it.
Absolutely nothing!

Imagine the responses above come from answers to the question *What did you like about the event?* The

first response would be positive and the second one would be negative, right? Now, imagine the responses come from answers to the question *What did you DISlike about the event?* The negative in the question will make sentiment analysis change altogether.

A good deal of preprocessing or post processing will be needed if we are to take into account at least part of the context in which texts were produced.

However, how to preprocess or post process data in order to capture the bits of context that will help analyze sentiment is not straightforward.

2. Irony andSarcasm

Differences between literal and intended meaning (i.e. *irony*) and *sarcasm* usually change positive sentiment into negative whereas negative or neutral sentiment might be changed to positive. However, detecting irony or sarcasm takes a good deal of analysis of the context in which the texts are produced and, therefore, are really difficult to detect automatically.

3. Emojis

There are two types of emojis according to [6]. *Western emojis*(e.g. :D) are encoded in only one character or in a combination of a couple of them whereas*Eastern emojis*(e.g. ¯ \ _ (ツ) _ / ¯) are a longer combination of characters of a vertical nature.

Particularly in tweets, emojis play a role in the sentiment of texts.

4. DefiningNeutral

Defining what we mean by *neutral* is another challenge to tackle in order to perform accurate sentiment analysis. As in all classification problems, defining our categories and, in this case, the *neutral* tag is one of the most important parts of the problem. What *we* mean by *neutral*, *positive*, or *negative* does matter when we train sentiment analysis models.

I. OVERVIEW OF USER PROFILEANALYZER

In this paper we provide a wide array of information about the tweets published on twitter by multiple users and to analyze those tweets so as to obtain meaningful information about that particular topic.

The main information we obtain from this is the sentiment value of a particular product/person/organization etc which can be used to estimate the value of that resource in the community.

Following are the key Steps done:

1. StreamingTweets

The Twitter streaming API is used todownload twitter messages in real time. It is useful for obtaining a highvolumeoftweets,orforcreatingalivefeedusinga site stream or userstream.

2. Cursor and Pagination

Cursor and Pagination is a technique for breaking large record sets into smaller portions called pages. This module will use the python libraries so as to obtain the tweets in a proper readable manner.

3. AnalyzingTweets

We downloaded the tweets made by a specific user,tweets based on specific hashtag(keyword based search),tweets of a specific user,the likes and retweet made on a particular tweets which is elaborated in next section

4. VisualizingTweets

Matplotlib is a python library that visually graphs Twitter trends based on a variety of factors, such as number of tweets and followed total. It takes its information from a sample subset of Twitter accounts. The data can be complicated to work with, but it is a unique way to visualize data on Twitter

5. SentimentalAnalysis

The process of computationally identifying and categorizing opinions expressed in a piece of text, especially in order to determine whether the writer's attitude towards a particular topic, product, etc. is positive, negative, or neutral.

II. EASE OFUSE

A. Selecting a socialplatform

First, we decided on a social platform to capture data from. A number of platforms were taken into consideration including Facebook, YouTube and Twitter. The reason for choosing Twitter was that itis a largely used platform by common people and big personalities alike. Also, Twitter is accessible for unregistered users as well which can be used to monitor and analyze data unlike Facebook that uses privacy settings for its profiles.[3]As a result, Twitter datacanbealargedoorintotheinsightsofthegeneral public, and how they receive a topic. That, combined with the openness and the generous rate limiting of Twitter's API, can produce powerfulresults..

B. Selecting the programminglanguage

Python has an accurate interactive shell and has a large collection of open source packages, simple syntax and it takes much less time to write and debug

bybeingsimpleandreadable.Thereareseveralhighly optimized libraries related to learning Python machines like Tweepy, Text Blob, Numpy, Pandas andOpenCVthatyoucanuseinyourcodeevenifyou know a minimum ofPython.

Prerequisites for Twitter data extraction:

In order to use Twitter's API, we have to create a developer account on the Twitter apps site.

- Open ' https://apps.twitter.com/' and clickthe button: 'Create NewApp'
- Fill the application details. You can leavethe callback url field empty.
- Once the app is created, you will beredirected to the apppage.
- Open the 'Keys and Access Tokens'tab.
- Copy 'Consumer Key', 'ConsumerSecret', 'Access token' and 'Access TokenSecret'.

C. Librariesused

- **Tweepy:** tweepy is the python client forthe official TwitterAPI.
- **TextBlob:** textblob is the python libraryfor processing textualdata
- **Matplotlib :**matplotlib is a Python 2Dplotting library which produces publication quality figures in a variety of hard copy formats and interactive environments acrossplatforms.
- **Numpy:** numpy is the core library for scientific computing in Python. It provides a high-performance multidimensional array object,and tools for working with thesearrays.
- **Pandas:** pandas aims to be thefundamental high-level building block for doing practical, real world data analysis in Python.

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III. METHODOLOGY

Once the environment is set up and keys for Twitter are obtained, the methodology used for extracting tweets from Twitter and analyzing the Profiles is given below:

We follow these 5 major steps:

A. Authorize Twitter APIClient
B. FetchTweets
C. Analyze Tweets
D. VisualizeTweets
E. SentimentAnalysis

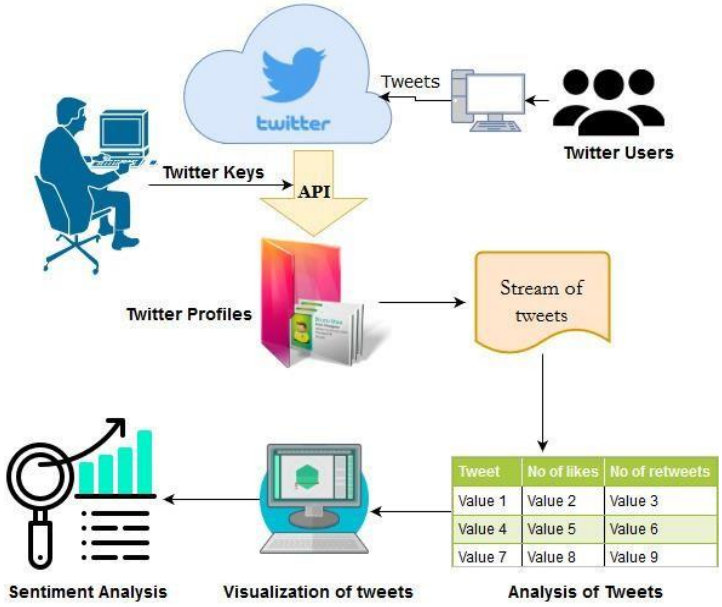


Fig.3.0 Block diagram of the Twitter Profile Analyzer

A. Authorize Twitter APIClient

In order create the API object, we must first authenticateourselveswithourdeveloperinformation. Tweepy supports oauth authentication.Authentication is handled by the tweepy.AuthHandlerclass.
After creating an OAuthHandlerinstance,we pass our consumer token and secret into it.
auth = tweepy.OAuthHandler(consumer_token, consumer_secret)
Ifyouhaveawebapplicationandareusingacallback URLthatneedstobesupplieddynamicallyyouwould pass it inas:
auth = tweepy.OAuthHandler(consumer_token, consumer_secret,callback_url)
Unlike basic auth, we must do the OAuth "dance" before we can start using the API. We must complete the following steps:

1. Get a request token fromtwitter
2. Redirect user to twitter.com to authorize our application
3. If using a callback, twitter will redirect the user to us. Otherwise the user mustmanually supply us with the verifiercode.
4. Exchange the authorized request token foran accesstoken.

If this is a desktop application (or any application not using callbacks) we must query the user for the "verifier code" that twitter will supply them afterthey

authorize us. Inside a web application this verifier value will be supplied in the callback request from twitter as a GET query parameter in the URL.

The methodology used by us involves an application that does not use callback and hence we usefollowing way:

```
auth = OAuthHandler(CONSUMER_KEY, CONSUMER_SECRET)
auth.set_access_token(ACCESS_TOKEN, ACCESS_TOKEN_SECRET)
```

B. *FetchTweets*

InTweepy,aninstanceoftweepy.Streamestablishesa streaming session and routes messages to StreamListener instance. The on_data method of a stream listener receives all messages and calls functions according to the messagetype.

Therefore using the streaming api has three steps.

- Create a class inheriting from **StreamListener**
- Using that class create a **Stream**object
- ConnecttotheTwitterAPIusingthe**Stream**.

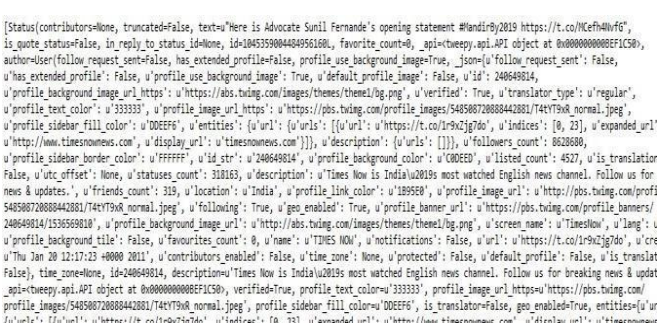
C. AnalyzeTweet

Anumberoffunctionsareappliedontheextracted tweets so as to get information regarding them. The basic thing done is to organize the tweets in a dataframe using pandas and numpy library. The following analysis was done:

1. Accessing your own timeline

Tobeginwith,wehaveaccessedourowntimelineand fetchedalltweetsfromit.WedidthisbyusingtheAPI object's home_timeline() function. We then store the result in a variable, and loop through it to print the results. By accessing our own timeline tweets, we can learn about the popularity of our own tweets and understand what type of content resonates the best among our audiences. It gives an insight about how muchourtweethasgainedattentionbymeansoflikes

and retweets.


[Status(contributors=None, truncated=False, text=u"Here is Advocate Sunil Fernande's opening statement #Mandir8y2019 https://t.co/MCefh4Nvf6",
is_quote_status=False, in_reply_to_status_id=None, id=1045359004484956160L, favorite_count=0, _api=<tweepy.api.API object at 0x000000000EF1C50>,
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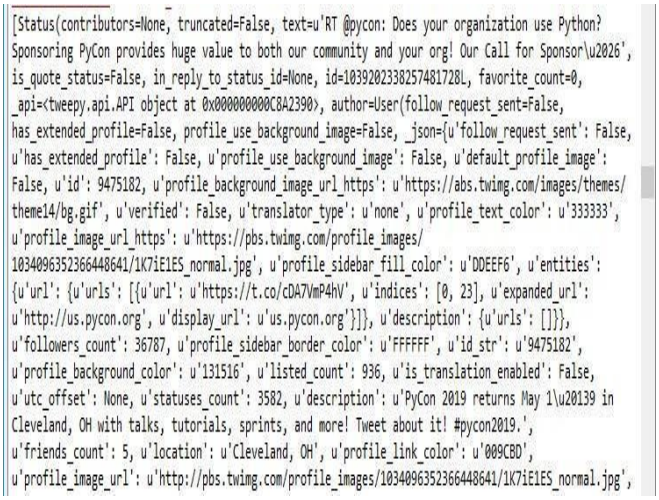
u'has_extended_profile': False, u'profile_use_background_image': True, u'default_profile_image': False, u'id': 240649814,
u'profile_background_image_url_https': u'https://abs.twimg.com/images/themes/theme1/bg.png', u'verified': True, u'translator_type': u'regular',
u'profile_text_color': u'333333', u'profile_image_url_https': u'https://pbs.twimg.com/profile_images/548508720888442881/T4tYT9xR_normal.jpeg',
u'profile_sidebar_fill_color': u'DDEEF6', u'entities': {u'url': {u'urls': [{u'url': u'http://www.timesnownews.com', u'indices': [0, 23], u'expanded_url'
u'http://www.timesnownews.com', u'display_url': u'timesnownews.com'}]}, u'description': {u'urls': []}}, u'followers_count': 8628680,
u'profile_sidebar_border_color': u'FFFFFF', u'id_str': u'240649814', u'profile_background_color': u'C0DEED', u'listed_count': 4527, u'is_translatior
False, u'utc_offset': None, u'statuses_count': 318163, u'description': u'Times Now is India\u2019s most watched English news channel. Follow us for
news & updates.', u'friends_count': 319, u'location': u'India', u'profile_link_color': u'1B95E0', u'profile_image_url': u'http://pbs.twimg.com/profi
548508720888442881/T4tYT9xR_normal.jpeg', u'following': True, u'geo_enabled': True, u'profile_banner_url': u'https://pbs.twimg.com/profile_banners/
240649814/1536569810', u'profile_background_image_url': u'http://abs.twimg.com/images/themes/theme1/bg.png', u'screen_name': u'TimesNow', u'lang': u
u'profile_background_tile': False, u'favourites_count': 0, u'name': u'TIMES NOW', u'notifications': False, u'url': u'https://t.co/1r9xZjg7do', u'cre
u'Thu Jan 20 12:17:23 +0000 2011', u'contributors_enabled': False, u'time_zone': None, u'protected': False, u'default_profile': False, u'is_translat
False}, time_zone=None, id=240649814, description=u'Times Now is India\u2019s most watched English news channel. Follow us for breaking news & updat
_api=<tweepy.api.API object at 0x000000000EF1C50>, verified=True, profile_text_color=u'333333', profile_image_url_https=u'https://pbs.twimg.com/
profile_images/548508720888442881/T4tYT9xR_normal.jpeg', profile_sidebar_fill_color=u'DDEEF6', is_translator=False, geo_enabled=True, entities={u'ur
{u'urls': [{u'url': u'http://www.timesnownews.com', u'indices': [0, 23], u'expanded_url': u'http://www.timesnownews.com', u'display_url': u'timesnownews

Fig.3.1 Tweets obtained of our own timeline


[Status(contributors=None, truncated=False, text=u'RT @pycon: Does your organization use Python?
Sponsoring PyCon provides huge value to both our community and your org! Our Call for Sponsor\u2026',
is_quote_status=False, in_reply_to_status_id=None, id=1039202338257481728L, favorite_count=0,
_api=<tweepy.api.API object at 0x000000000C8A2390>, author=User(follow_request_sent=False,
has_extended_profile=False, profile_use_background_image=False, _json={u'follow_request_sent': False,
u'has_extended_profile': False, u'profile_use_background_image': False, u'default_profile_image':
False, u'id': 9475182, u'profile_background_image_url_https': u'https://abs.twimg.com/images/themes/
theme14/bg.gif', u'verified': False, u'translator_type': u'none', u'profile_text_color': u'333333',
u'profile_image_url_https': u'https://pbs.twimg.com/profile_images/
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{u'url': {u'urls': [{u'url': u'https://t.co/cDA7VmP4hV', u'indices': [0, 23], u'expanded_url':
u'http://us.pycon.org', u'display_url': u'us.pycon.org'}]}, u'description': {u'urls': []}},
u'followers_count': 36787, u'profile_sidebar_border_color': u'FFFFFF', u'id_str': u'9475182',
u'profile_background_color': u'131516', u'listed_count': 936, u'is_translation_enabled': False,
u'utc_offset': None, u'statuses_count': 3582, u'description': u'PyCon 2019 returns May 1\u20139 in
Cleveland, OH with talks, tutorials, sprints, and more! Tweet about it! #pycon2019.',
u'friends_count': 5, u'location': u'Cleveland, OH', u'profile_link_color': u'009CBD',
u'profile_image_url': u'http://pbs.twimg.com/profile_images/1034096352366448641/1K7iE1ES_normal.jpg',

2. *Accessing tweets of a specific user*

We do this by using the user_timeline() function of API object. This is particularly useful to make a detailedanalysisofthetweetsofaspecificusertofind out his/her popularity, their influence on the community and their reach amongst various parts of thecommunity.TheTwitterAPIprovidesinformation about specific users based on searching specific Twitter handles. This is important to get a detailed evaluationofauser.Forexample,sincesource,ie.the deviceonwhichTwitterwasstarted,isincludedinthe tweets we accessed, we can find when the user when willbesittingonapersonalcomputerorwhentheuser willbeusingTwitteronitshandhelddevices.Wealso getanunderstandingofwhenauserswitchedtoanew phone or understand their pattern of life. . Along with such information, we also find his/her impact and reachinthecommunity,whatistheresponsegivenby the audience of that user and what is of interest to the user itself.

Fig.3.2 Tweets gathered from a specific user '@pycon'

3. *Accessing tweets using a set ofkeywords*

This is done by creating a hash tag list and passing the list as argument 'track' in the filer() method of Stream class. Thus the Stream class filters all tweets having the keywords or hashtagsmentioned in the list given by user and presents the results in a json file or on theconsole.

Hash based search is growing more and more importanttodaysincehashtagshavegainedpopularity and are present in almost every tweet of users all over the Twitter community.Hashtags have been an important tool to organize and sort tweets of various users. They are a great way to indicate the content is relevant to a certain topic we are interested to peek into. These hashtagsare easily searchable and become an extraordinary marketing tool for marketing, businesses, celebrities, and even theaverage

individuals. The tweets obtained from them are all the more useful for the same.After doing preprocessing the information is presented as the average number of likes of a particular user, average length of tweets and average number of retweets of a particular user.The result obtained includes the tweet as well as other information about the tweets in a proper format as follows:


{"created_at":"Sun Sep 23 09:20:14 +0000 2018","id":1043792144903884800,"id_str":"1043792144903884800","text":"RT @vikaskyogi: \u0914\u0930 PM \u0905\u092e\
{"created_at":"Sun Sep 23 09:20:15 +0000 2018","id":1043792149488308226,"id_str":"1043792149488308226","text":"RT @kansaratva: Rahul, Kejriwal, and Trudeau
{"created_at":"Sun Sep 23 09:20:17 +0000 2018","id":1043792154458345472,"id_str":"1043792154458345472","text":"RT @ssurjewala: Amit Shahji,\n\nCongress doe
{"created_at":"Sun Sep 23 09:20:17 +0000 2018","id":1043792155095883776,"id_str":"1043792155095883776","text":"RT @amitmalviya: Rahul Gandhi goes blank when
{"created_at":"Sun Sep 23 09:20:17 +0000 2018","id":1043792155557257216,"id_str":"1043792155557257216","text":"RT @TheQuint: Opinion | Not even one minister
{"created_at":"Sun Sep 23 09:20:18 +0000 2018","id":1043792160254881792,"id_str":"1043792160254881792","text":"RT @ndtv: I won\u2019t be surprised if the wh
{"created_at":"Sun Sep 23 09:20:18 +0000 2018","id":1043792159785324547,"id_str":"1043792159785324547","text":"RT @kunalpurohit: Lool. The BJP must make up
{"created_at":"Sun Sep 23 09:20:19 +0000 2018","id":1043792163748892672,"id_str":"1043792163748892672","text":"RT @Shehzad_Ind: I have proof on how on Rafal
{"created_at":"Sun Sep 23 09:20:19 +0000 2018","id":1043792166580031488,"id_str":"1043792166580031488","text":"RT @davidfrawleyved: India's healthcare syste
{"created_at":"Sun Sep 23 09:20:19 +0000 2018","id":1043792166940790784,"id_str":"1043792166940790784","text":"RT @bombaywallah: Lessons from recent history
{"created_at":"Sun Sep 23 09:20:21 +0000 2018","id":1043792173123002374,"id_str":"1043792173123002374","text":"RT @amitmalviya: Rahul Gandhi and his mother
{"created_at":"Sun Sep 23 09:20:23 +0000 2018","id":1043792182971379713,"id_str":"1043792182971379713","text":"RT @SPSHARMI1341210: @edcjai Yes that is the
{"created_at":"Sun Sep 23 09:20:24 +0000 2018","id":1043792184053395456,"id_str":"1043792184053395456","text":"RT @rajeev_mp: So @RahulGandhi is ok with #Da
{"created_at":"Sun Sep 23 09:20:25 +0000 2018","id":1043792191947264003,"id_str":"1043792191947264003","text":"RT @ZeeNews: PM #NarendraModi launches #Ayush
{"created_at":"Sun Sep 23 09:20:26 +0000 2018","id":1043792192421212160,"id_str":"1043792192421212160","text":"RT @rose_k01: Rahul Gandhi & Randeep Surj

er

Fig.3.3 Tweets containing the keywords 'Rahul Gandhi' , 'Narendra Modi' .

	Tweets	id	...	likes	retweets
0	Sharing my speech at the Karyakarta Mahakumbh ...	1044584089808908289	...	522	131
1	It has been 17 years and counting, the Congres...	1044582736990629888	...	1323	484
2	?????? ????? ?? ?????? ?? ????? ??? ??????? \n...	1044582325038702592	...	921	329
3	??? ???? ?? ???????? ??? ???? ????????? ?? ?????...	1044581588355362818	...	1296	424
4	We have also lost elections but we have never ...	1044581294468808705	...	1119	405
5	??? ???? ?? ??????? ?? ???? ?? ???? ?? ????? \...	1044580950288429058	...	1055	352
6	The @BJP4India family is grateful to all our l...	1044580808642576384	...	1060	332
7	????? ??????? ???????? ?? ?? '?????? ???????' ...	1044580081752887296	...	1295	399
8	????? ?? ?????????? ??????? ?? ??? ????????? #...	1044579887002972160	...	1078	315
9	Looking forward to interacting with the hardwo...	1044425650982080513	...	7889	2060
10	Just doing my work and doing everything possib...	1044424867603468289	...	9580	2219
11	Thank you! I am confident the Pakyong Airport ...	1044422654252511232	...	11766	2577
12	Thanks Abhinav! I appreciate your optimism. As...	1044421950162890752	...	4812	1202
13	Thank you for the kind words. The scenery was ...	1044421734047322112	...	3231	715
14	It did startle me that for almost seven long d...	1044421614748815361	...	3975	1029
15	????? ??????? ????????? ?? ?? ????-????? ?? ???...	1044420346701471744	...	13478	3417
16	Addressed a public meeting in Pakyong, Sikkim....	1044192793734766595	...	10485	2302
17	In the Pakyong Airport, Sikkim gets its first ...	1044192023190749184	...	22502	4799
18	Serene and splendid! \n\nClicked these picture...	1043840106631745538	...	35752	6546
19	Along with affordable healthcare, the Governme...	1043823702062682112	...	18470	4389

[20 rows x 7 columns]
Average length of tweets=
134.9
Average number of likes=
35752
Number of retweets=
6546

Fig.3.4 Tabulated tweets and information about tweets of user @narendramodi

D. Visualizing tweets

Tweets now are visualized as graphs. By organizing data, it is more easy to interpret what has been observed. Making sense of data is called interpretation. Since most of the data we collected (such as number of likes and retweets) is quantitative, data tables and *charts* are usually used to organize the information. *Graphs* are created from data tables. The Pythonlibrarymatplotlibproducespublicationquality figures in a variety of hard copy formats and interactive environments acrossplatforms.

The most popular, visualization for time series, the line plot is used here. It is plotted by Series and plot functionsofmatplotliblibrary.Thiscanbeusedtoget a graph of number of likes and retweets for the tweets of a particular user over a period oftime.

Following are the figures showing graphs of likes and tweets in a Time Series graphs and Layered Time Series Graphs:

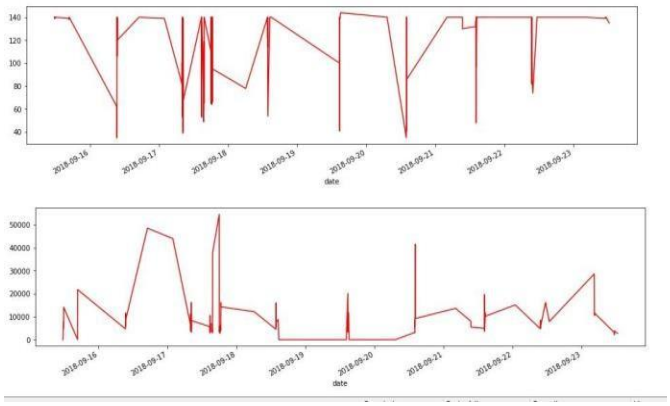


Fig.3.5(a)GraphofLikes(X-axis)vsTime(Yaxis)of tweets of a particular user for a period oftime

(b) Graph of Retweets (X-axis) vs Time (Y axis) of tweets of a particular user for a period oftime

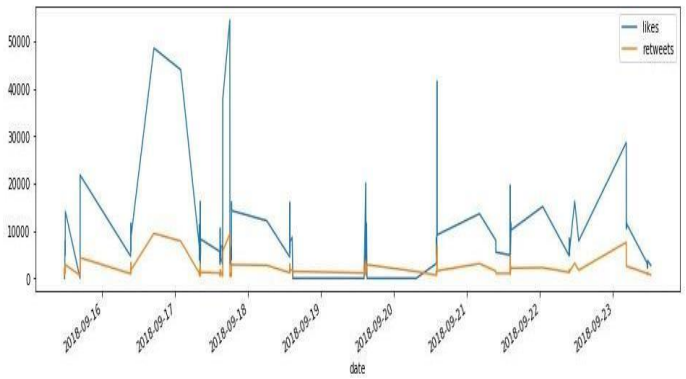


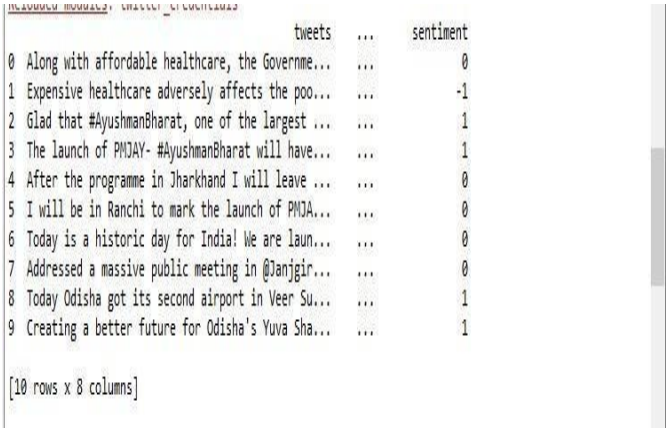
Fig.3.6 Joint graph of Likes and retweets (X-axis) vs Time (Y axis) of tweets of a particular user for a period of time

E. SentimentAnalysis

Sentiment analysis of tweets of a particular user is obtained by using polarity values and classifying sentiments as

1. Positive:1
2. Negative:-1

3. Neutral:0



	tweets	...	sentiment
0	Along with affordable healthcare, the Governme...	...	0
1	Expensive healthcare adversely affects the poo...	...	-1
2	Glad that #AyushmanBharat, one of the largest ...	...	1
3	The launch of PMJAY- #AyushmanBharat will have...	...	1
4	After the programme in Jharkhand I will leave ...	...	0
5	I will be in Ranchi to mark the launch of PMJA...	...	0
6	Today is a historic day for India! We are laun...	...	0
7	Addressed a massive public meeting in @Janjgir...	...	0
8	Today Odisha got its second airport in Veer Su...	...	1
9	Creating a better future for Odisha's Yuva Sha...	...	1

[10 rows x 8 columns]

Fig.3.7 Sentiment analysis carried out for ten tweets of our Prime Minister, Narendra Modi

IV. CONCLUSION

Large amount of data is available through various social media platform and analyze of this data is the major challenge. Through this work we mainly analyzed the data from twitter. By extracting tweets related to specific user or keyword based tweet search helps in identifying the specific tweets from the pool of large tweets. Also by analyzing the number of retweets and like we can identify the popularity of the subject in market related to various fields. Also by analyzing the sentiment associated with the tweets helpsinclassifyingthemaccordingtothepolarity.We can aggregate the Polarity information and find the aggregate sentiment associated with any topic in general.

V. REFERENCES

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