

ANALYSIS OF SOCIAL MEDIA USERS' SENTIMENT, ATTITUDE AND EMOTIONS TOWARDS COVID-19 USING COMMENTS

VIBHA K CHITRAVVARA¹, SAHANA N², Dr. N. GURUPRASAD³

^{1,2}6th semester, Department of Computer Science and Engineering,
Global Academy of Technology, Bengaluru

vibhakrishna2001@gmail.com, sahananagaraj86@gmail.com ³Professor, Department of Computer Science
And Engineering, Global academy of Technology, Bengaluru,

nguruprasad18@gmail.com, nguruprasad@gat.ac.in

Abstract—In our study, we investigated how people reacted to one another throughout the anguish by analyzing social media comments and doing a sentiment analysis on these comments regarding covid19 collected from Kaggle [1] by drawing positive, negative, and neutral comments in a Python environment. This study can be beneficial in a variety of ways, such as allowing organization or social service departments, as well as the government, to keep track of people's requirements, how the public is reacting to the strain, and the issues and challenges they are facing in order to assist the needy. Non-governmental organizations (NGOs) that wish to help people who are struggling to make ends meet on a daily basis

I. INTRODUCTION

Social media is one of the internet's biggest virtual communication platforms which allow its users to express their emotions, thoughts, ideas and information. Billions of people in the world use social media to communicate with each other, offer services to connect with their peers, new people and who they are compatible with. Social media consists of posts which offer an option for its users to comment on certain posts. This allows them to connect with each other based on their opinions and information. With the emergence of the internet and advent of social media, not only are we learning the latest news updates, but we are also using platforms like Facebook and Twitter to provide personal and business updates.

Covid-19 has affected many lives in many different ways. One third of the world's population was infected and during this challenging time due to the pandemic, many people have lost their lives, family and loved ones and it was extremely difficult for people to meet their acquaintances and family in order to keep each other safe. Everyone mostly depended on social media platforms to connect with their loved ones.

Surprisingly it was observed that people have helped other people on social media without any strings attached, and maintained a positive environment or rather a neutral environment.

A. KEYWORDS

Covid-19, Tweets, social media, Data analysis.

WHAT IS SENTIMENT ANALYSIS?

Sentiment analysis (or opinion mining) is a Natural Language Processing(NLP)technique used to determine whether data is positive, negative or neutral [2].

II. PROBLEM STATEMENT

We are going to build a classification model to predict the sentiment of Covid-19 tweets. The tweets have been taken from the Kaggle data set. We are given information like 'user_name', 'user_location', 'user_description', 'user_created', 'user_followers', 'user_friends', 'user_favourites', 'user_verified', 'date', 'text', 'hashtags', 'source', 'is_retweet'.

A. FEW TWEETS

As sentiment analysis works to extract positive, negative, and neutral comments, let's look at a few tweets to understand this scale of sentiment better. We can tell that "This pandemic isn't helping me at all, all my bills are stacked up and I'm on the verge of losing my job" is a negative statement, "I woke up early today" is a neutral statement and "I hope everyone's healthy and taking care of each other! Sending prayers everyone's way. Let's fight this pandemic together!" is clearly a positive statement. But while working on an extremely huge dataset, it is impossible to read every sentence and check its sentiment. So, this analytical technique of sentiment analysis helps us get the results in a faster and an adequate manner.

III. DATA SET

The dataset was extracted from Kaggle. It has 13 columns, and a total of 179107 comments on which we have performed data analysis.

```

0      If I smelled the scent of hand sanitizers toda...
1      Hey @Yankees @YankeesPR and @MLB - wouldn't it...
2      @diane3443 @wdunlap @realDonaldTrump Trump nev...
3      @brookbanktv The one gift #COVID19 has give me...
4      25 July : Media Bulletin on Novel #CoronaVirus...
      ...
179103 Thanks @IamOhmai for nominating me for the @WH...
179104 2020! The year of insanity! Lol! #COVID19 http...
179105 @CTVNews A powerful painting by Juan Lucena. I...
179106 More than 1,200 students test positive for #CO...
179107 I stop when I see a Stop\n\n@SABCNews\n@Izinda...
Name: text, Length: 179108, dtype: object

```

Fig. 1. Comments: a total of 179107 comments are represented.

	user_name	user_location	user_description	user_created	user_followers	user_friends	user_favourites	user_verified	date	text	hashtags	source	is_retweet
0	"%igst	astroworld	wednesday addams as a disney princess keepin...	2017-05-26 05:46:42	624	950	18775	False	2020-07-25 12:27:21	If I smelled the scent of hand sanitizers toda...	NaN	Twitter for iPhone	False
1	Tom Basile us	New York, NY	Husband, Father, Columnist & Commentator. Auth...	2009-04-16 20:06:23	2253	1677	24	True	2020-07-25 12:27:17	Hey @Yankees @YankeesPR and @MLB - wouldn't it...	NaN	Twitter for Android	False
2	Time4fiscouts	Pewee Valley, KY	#Christian #Catholic #Conservative #Raagan #Re...	2009-02-28 18:57:41	9276	9525	7254	False	2020-07-25 12:27:14	@diane3443 @wdunlap @realDonaldTrump Trump nev...	[COVID19]	Twitter for Android	False
3	ethel mertz	Stuck in the Middle	#Browns #Indians #ClevelandProud #[] #Cavs ...	2019-03-07 01:45:06	197	987	1488	False	2020-07-25 12:27:10	@brookbanktv The one gift #COVID19 has give me...	[COVID19]	Twitter for iPhone	False
4	DIPR-J&K	Jammu and Kashmir	// Official Twitter handle of Department of Inf...	2017-02-12 06:45:15	101009	168	101	False	2020-07-25 12:27:08	25 July : Media Bulletin on Novel #CoronaVirus...	[CoronaVirusUpdates', 'COVID19]	Twitter for Android	False

Fig. 2. A few columns of the dataset are represented.

Twitter Web App	12296
Twitter for Android	10019
Twitter for iPhone	8667
TweetDeck	2117
Hootsuite Inc.	1142
Twitter for iPad	1010
Buffer	498
Instagram	475
IFTTT	373
Sprout Social	270
GlobalPandemic.NET	194
dlvr.it	167
FS Poster	152
COVID19-Updates	148
LinkedIn	143

Fig. 3. **Source:** The highest number of tweets are seen in “Twitter Web App” with about 12296 tweets. The order of the first

For a better understanding the results were plotted in a bar graph format as shown below.

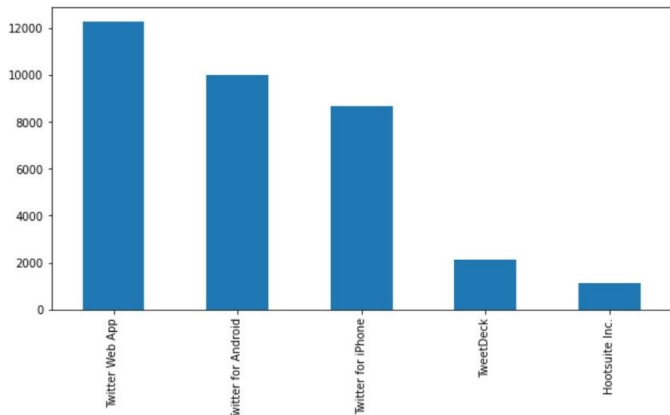


Fig. 4.

Hashtags: Maximum hashtags were COVID-19 and the highest number of comments were from India taken from users' location.

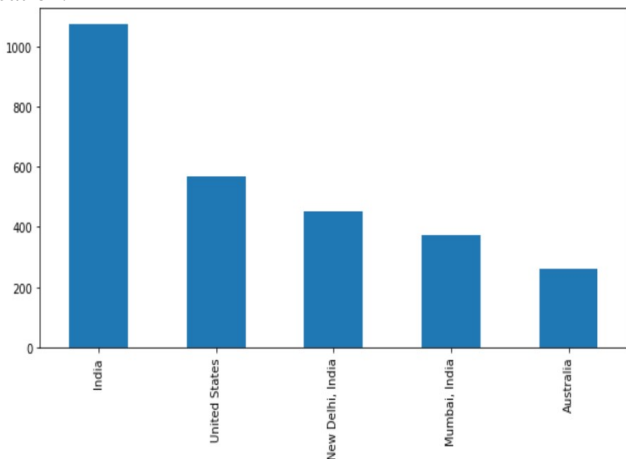


Fig. 5. Area

The maximum number of hashtags is represented in a bar graph format with other different hashtags which were observed.

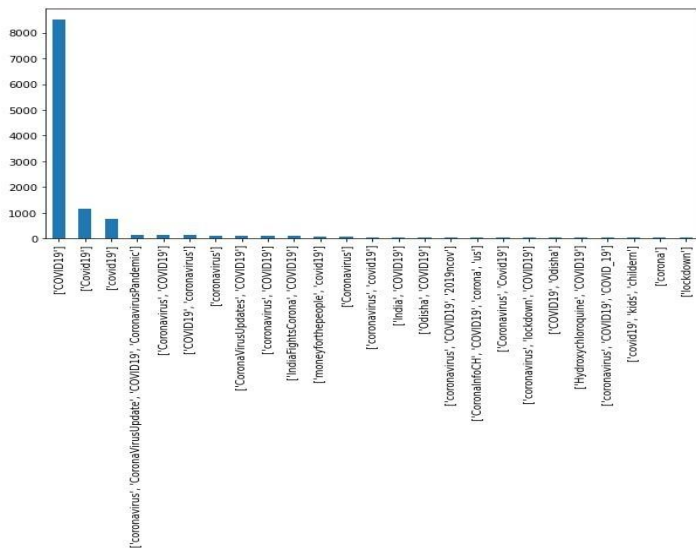


Fig. 6. Hashtags

A. DATA CLEANING

Data cleaning is the important part which comes under data pre-processing which involves transforming a raw data to an efficient format which makes it easier for us to work on the data. In short it removes all the punctuations, special characters, URLs, multiple white spaces, and numbers.

Suppose we have-
Hey @Yankee how you doing
As a comment, it changes it to something like: Hey Yankee how you doing
So, we cleaned up our data set to clear up these tweets, and the end result looked like this:

	text	clean_tweet
0	If I smelled the scent of hand sanitizers toda...	If I smelled the scent of hand sanitizers toda...
1	Hey @Yankees @YankeesPR and @MLB - wouldnt it...	Hey and wouldnt it have made more sense to ha...
2	@diane3443 @wdunlap @realDonaldTrump Trump nev...	Trump never once claimed was a hoax We all cl...
3	@brookbankvt The one gift #COVID19 has give me...	The one gift has give me is an appreciation f...
4	25 July : Media Bulletin on Novel #CoronaVirus...	25 July : Media Bulletin on Novel
...
52002	#COVID19 POLL InWill the @ciacsports decision ...	POLL Will the decision to sanction Fall sport...
52003	UK. Coronavirus (COVID-19) in the UK.\n\nDail...	UK Coronavirus (COVID19) in the UK Daily numbe...
52004	Replace the word "productive" with "expensive"...	Replace the word productive with expensive and...
52005	12:9:1 ==> SMI is now offering Protective F...	12:9:1 ==gt SMI is now offering Protective Fac...
52006		

Fig. 7.Clean text

B. POLARITY AND SUBJECTIVITY

The comments can be subjective or objective (Polarity). When a sentence is passed into Textblob it gives two outputs, which are polarity and subjectivity. We also checked which comments come under which category. Subjectivity deals with the emotional aspect of the sentence for example, blis, annoyance, etc. And its range is in between the float value of [-1,1]. It could either be positive [0,1] or be negative[-1,0].

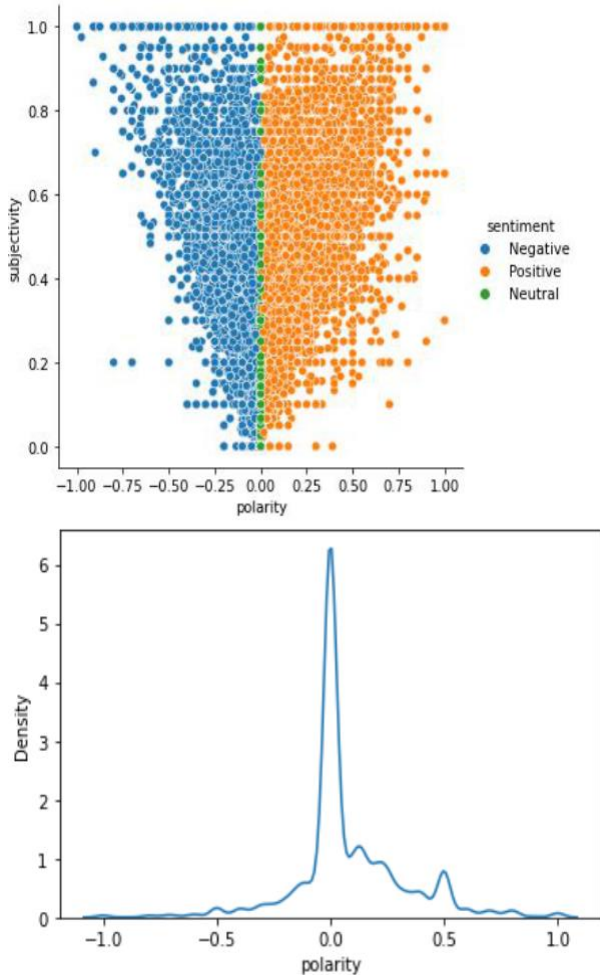
Polarity is the output that lies between [-1,1], here -1 refers to negative sentiment and +1 refers to positive sentiment. Polarity is based on factual information.

The following image shows three added columns of polarity, subjectivity, and its sentiment.

text	hashtags	source	is_retweet	clean_tweet	sentiment_results	polarity	subjectivity	sentiment
If I smelled the scent of hand sanitizers toda...	[COVID19]	Twitter for iPhone	False	If I smelled the scent of hand sanitizers toda...	{'polarity': -0.25, 'subjectivity': 0.25, 'sentim...	-0.25	0.250000	Negative
Hey @Yankees @YankeesPR and @MLB - wouldnt it...	[COVID19]	Twitter for Android	False	Hey and wouldnt it have made more sense to ha...	{'polarity': 0.5, 'subjectivity': 0.5, 'sentim...	0.50	0.500000	Positive
@diane3443 @wdunlap @realDonaldTrump Trump nev...	[COVID19]	Twitter for Android	False	Trump never once claimed was a hoax We all cl...	{'polarity': 0.0, 'subjectivity': 0.0, 'sentim...	0.00	0.000000	Neutral
@brookbankvt The one gift #COVID19 has give me...	[COVID19]	Twitter for iPhone	False	The one gift has give me is an appreciation f...	{'polarity': 0.0, 'subjectivity': 0.0, 'sentim...: 0.3571428571...	0.00	0.357143	Neutral
25 July : Media Bulletin on Novel #CoronaVirus...	[CoronaVirusUpdates', 'COVID19]	Twitter for Android	False	25 July : Media Bulletin on Novel	{'polarity': 0.0, 'subjectivity': 0.0, 'sentim...	0.00	0.000000	Neutral

Fig. 8. Sentiment for each text

Polarity, subjectivity in account to sentiment analysis by using seaborn.

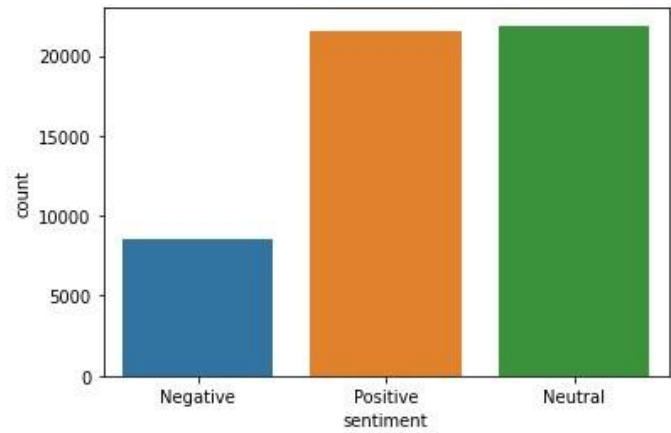


We can say that the density of sentiment is high towards positive and neutral.

IV. CONCLUSION

The comments are divided into three categories: positive, negative, and neutral. In the comments, we can observe that the number of positive and neutral responses is roughly equal, while the number of negative ones is far smaller. As a result, we may say that social media has benefited Generation Z and millennials in overcoming, sharing, and keeping a positive atmosphere. It's heartwarming to see strangers banding together to fight the pandemic during these tough times. This was the first epidemic in which people were able to freely communicate with one another while at home.

The analysis of the study is depicted graphically below. The majority of the responses were positive and neutral, with less than half being negative.



REFERENCES

[1] Gabriel Preda, "COVID19 Tweets", [Online Dataset]
<https://www.kaggle.com/datasets/gpreda/covid19-tweets>
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<https://monkeylearn.com/sentiment-analysis/>