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Sentiments Analyzer

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Abstract: *Individual internet usage has expanded significantly in today's globe when compared to previous years. The evolution of AI has occurred as technology has advanced dramatically. Covid-19 is a global pandemic that has been underway since 2019, and the WHO has advised governments to take the appropriate steps to contain the problem. To safeguard citizens from this hazardous illness, the Indian government has planned a state-by-state lockdown beginning March 24, 2020. People were not allowed to work outside their homes during the curfew. All modes of transportation were restricted, with the exception of critical commodities transit and fire, police, and emergency services. Lockdowns were also imposed on educational institutions, industry, and hospitality services. On social media sites like Twitter and Koo, millions of people around the world began to express their views on the imposition of lockdown during the outbreak. Sentiment analysis, a subset of machine learning, has emerged as one of the most important areas of natural language processing (NLP). The skills of sentiment analysis can be used to examine people's reactions to an event. This required data extraction in order to understand people's emotions and play a key role in making changes to keep the problem under control. The purpose of this study is to find out what Indian citizens think about the nationwide lockdown imposed by the Indian government in order to reduce the spread of Coronavirus. In this study, NLP and machine learning classifiers were used to analyse the sentiment of tweets. Information was obtained from Twitter, annotated with TextBlob, and preprocessed with the Python's natural language tool package. RNN is used to classify sentiment in this study. The majority of Indian inhabitants accept the Indian government's decision to enforce a lockdown during the corona outburst, according to the results of this survey.*

Keywords: Convolutional Neural Network, Deep Learning, Character, Segmentation

I. INTRODUCTION

Coronavirus disease (COVID-19), which began in Wuhan, China, has caused a regional and international public health calamity [1]. On January 20, 2020, the World Health Organization (WHO) released its first report on the scenario of Coronavirus disease 2019 (COVID-19) [2]. The Centers for Disease Control and Prevention (CDC) launched its Emergency Operations Center (EOC). The novel Coronavirus has been dubbed "2019-nCOV" by the WHO.

The severity of the COVID-19 influenza was underestimated until January 20, 2020, when the National Health Commission (NHC) formally designated it as a B-type infectious sickness and began combating it [3]. On January 30, 2020, the World Health Organization declared it a global medical emergency. COVID-19 is a virus that affects both humans and animals, wreaking havoc on their respiratory, digestive, liver, and nervous systems. The World Health Organization (WHO) reported 1,812,734 cases and 113,675 deaths in 213 countries as of April 14, 2020. COVID-19 cases are increasing due to a shortage of treatment and vaccines, as well as the fact that it is spread from person to person by direct contact with patients, coughing, and sneezing."

Prudence and social separation are the most cost-effective techniques to being safe in the absence of vaccine for these infectious diseases. Different physiological distancing restrictions are utilised to battle COVID-19, and social distance is an essential means of controlling the spread of the pandemic. People are instructed to stay at home and keep their distance from others. Shutdowns were used in almost every country to ensure social separation in public settings. There has never been a time in the history of mankind's civilization when the entire globe was placed under lockdown. Lockdown is an emergency procedure that prevents people from moving freely in public places.

COVID-19 is often discovered 2 to 14 days after the influenza virus, with symptoms ranging from mild to severe, and the possibility for death. New coronaviruses have developed as a serious global problem in a relatively short period of time.

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Since its discovery in Wuhan, Hubei People's Republic of China, in the first week of December 2019, it has spread to 213 countries, with verified cases in the United States, Spain, Italy, Germany, France, the United Kingdom, China, Iran, Turkey, Belgium, the Netherlands, and Switzerland.

However, additional COVID-19 cases are continuously being reported, and India is one of them. The world is facing unprecedented troubles as a result of the COVID-19 epidemic. Despite improvements in recognising the virus, prevention, and treatment, society is currently facing major psychological, cognitive, and social economic upheavals. Furthermore, past research has demonstrated that people are sensitive to emotional issues, mental health crises, fear, and anxiety in these conditions and epidemiological scenarios, all of which hinder their coping strategies (Gilman, 2010; Leung et al., 2003; Shultz et al., 2016). In conclusion, while the entire world is concentrated on producing COVID-19 flu vaccines and treatments, We may have been naive to the social conduct that occurs within countries, as the epidemic is complex, encompassing hard science as well as sociocultural components of behaviour.

The Indian government has imposed a state of emergency as a precaution, and it is critical to understand how the vast majority of the populace is reacting to the current situation. Given that India is one of the world's largest and most populous countries, with the highest internal migration rate, a huge geographical area, and healthcare challenges, the current endeavour aims to investigate community behaviour patterns in response to COVID-19 lockdown in India. Because humans are potential viral spreaders, understanding social behavioural responses is crucial when dealing with a pandemic in such a large country. The public's reaction to the epidemic in India is crucial. As a result, the purpose of this article is to better understand the community's reaction to the COVID-19 shutdown in India. To do this, the authors looked at the effectiveness of lockdown in India and looked at government initiatives during COVID-19.

Second, part 1 of this framework covered the introduction. Section 2 will cover related work, section 3 will outline our planned work, section 4 will show the results of our suggested work, and section 5 will wrap up this study.

II. DESCRIPTION

This research looks at how machine convolutional neural networks are used in the development of Covid-19 and lockdowns. Recurrent Neural Networks provided the greatest accuracy for the model. The training and testing datasets were either downloaded or taken from the system.

Researchers have been able to considerably increase the accuracy of their work thanks to recent breakthroughs in machine learning-based RNN. In this paper, we used a machine learning-based strategy to identify sentiment by extracting features from strong libraries in a real-life situation with a diverse backdrop and experimenting with convolutional neural networks on our huge dataset. Machine learning has a variety of applications in clinical trials and research.

Using micro-blog data to assess citizens' feelings is difficult, as anyone in the telecoms industry will tell you. Using machine learning-based predictive analytics to forecast likely events might help governments, for example, draw a better pool from a broad group of tweets from social media. Machine learning has also been utilised to enable real-time monitoring and data access for trial participants, as well as to establish the proper sample size to be tested and to take use of the potential of electronic records to avoid data-based errors. Here is a sentiment extraction method and approach that was utilised in the Twitter dataset and ranked for the best. Whereas, the AI industry is something on which our country's economy is heavily reliant. The government must comprehend the public' sentiments in order to contain the pandemic. If necessary precautions are not taken in this sector, catastrophic consequences will befall the country's population.

We used Machine Learning to create a system based on the aforementioned relevant efforts. The next parts will go through our suggested project.

III. METHODOLOGY

This section details the steps involved in developing our system.

- First, we'll require a dataset of tweets to complete the process. We gathered a Twitter dataset linked to the Covid-19 lockout in India. We will do preprocessing on the provided dataset after it has been prepared.
- We upload our dataset into the model once it has been prepared and preprocessed.
- We apply essential feature engineering procedures on the given dataset after uploading data. We eliminate noise from the data and divide the dataset into train and test data in this stage.

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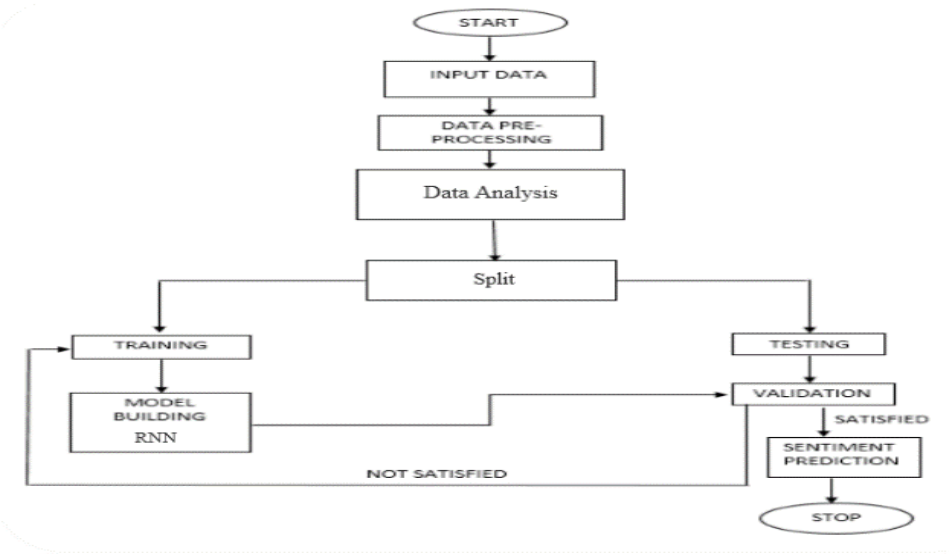
- We'll use a couple NLP approaches to put the dataset into a machine-readable format, and then we'll extract sentiments for the specifics.
- We use TensorFlow's Neural Networks to develop our suggested network throughout the train process. We're utilising a machine learning model here.
- Neural Networks are used in the proposed RNN design. TensorFlow neurons are used to construct the suggested model.



- Based on this suggested model categorization, the proposed model mostly classifies tweets as good, negative, or neutral to the lockdown.

III. Procedure Used

The procedure to develop our system is clearly described in this section.

- At first, to perform the operation we need a dataset related to tweets. We collect a twitter dataset related to covid-19 lockdown imposed across the India. After preparing the dataset, we will perform the preprocessing on the prepared dataset.
- Once the dataset is prepared and preprocessed, we upload our dataset into the model.
- After uploading data, we perform necessary feature engineering techniques on the considered dataset. In this step, we remove noise from the data and split the dataset into train data and test data.
- We will apply few NLP techniques in order to convert the dataset into machine understandable format and then we will obtain the sentiments for the particulars.
- In the train process, we build our proposed network with the help of Neural Networks from TensorFlow. Here, we are using machine learning model.
- The proposed RNN architecture is based on Neural Networks. The proposed model is built using neurons from TensorFlow.
- Here the proposed model mainly classify the tweets as positive, negative or neutral to the lockdown based on this proposed model classification

IV. Result and Discussions

In this session we will discuss about the results that are obtained by performing the above proposed method and how they are extracted by using the NLP and RNN architecture.

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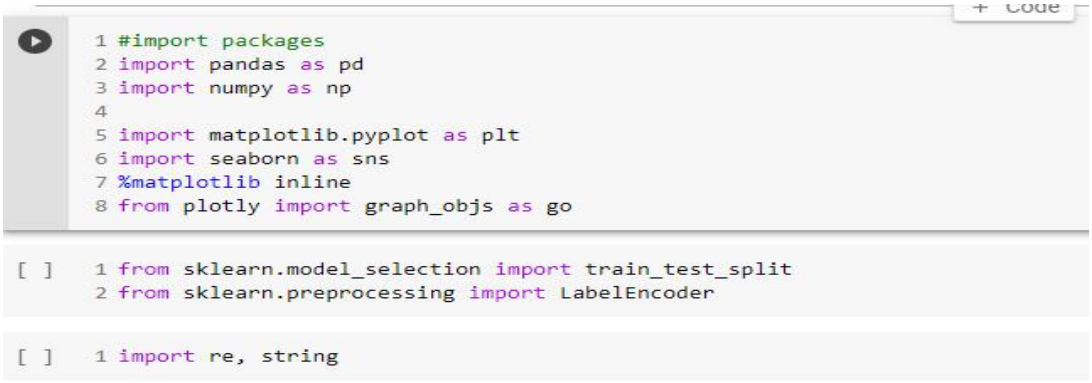

Figure 1: Required Libraries

The above images represents the loading procedure of required libraries in order to implement the project.

Figure 2: Loading Data

The above shown figure is showing us how to load the data into work environment i.e., python's Jupyter notebook.

Figure 3: Count Plot

The above shown figure is the count plot which includes the count of positives, negatives and neutrals in our particular column.

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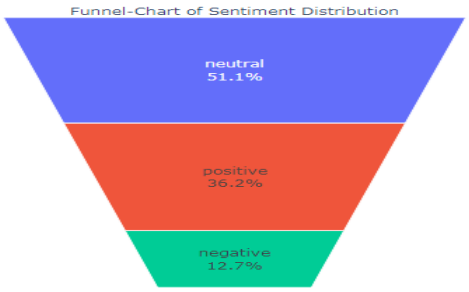

The above shown figure is the Funnel count plot which includes the count of positives, negatives and neutrals in our particular column with percentages.

```
def strip_links(text):
    link_regex    = re.compile('((https?):((//)|(\\\\))+([\w\d:#@%/;$()~_?\+-=\\\.&](#!)?)*)', re.DOTALL)
    links         = re.findall(link_regex, text)
    for link in links:
        text = text.replace(link[0], ', ')
    return text

def strip_all_entities(text):
    entity_prefixes = ['@','#']
    for separator in  string.punctuation:
        if separator not in entity_prefixes :
            text = text.replace(separator,' ')
    words = []
    for word in text.split():
        word = word.strip()
        if word:
            if word[0] not in entity_prefixes:
                words.append(word)
    return ' '.join(words)
```

```
all_tweets=train.text.values
all_modified_tweets=[]
for twt in all_tweets:
  all_modified_tweets.append(strip_all_entities(strip_links(twt)))

train['clean_text']=all_modified_tweets
```

Figure 5: Data Cleaning

The above shown figure is the cleaning part of data where we are removing unwanted attributes with in the dataset.

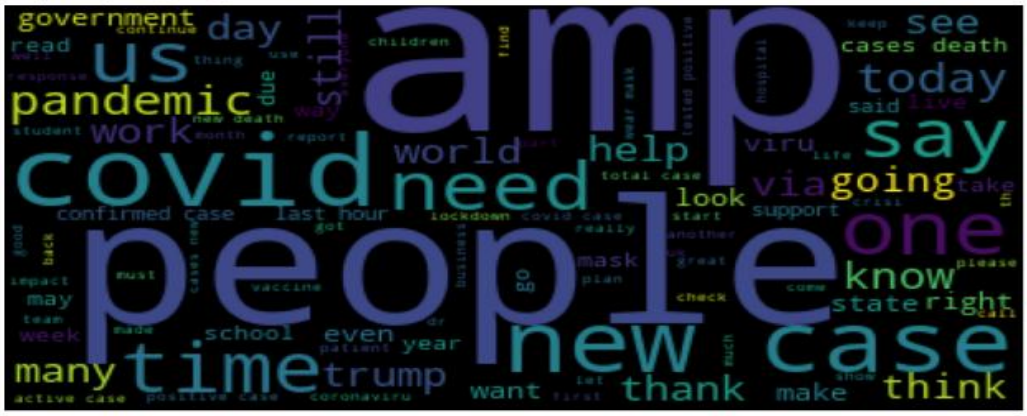

Figure 6: Tweets Cloud

The above shown figure is the Tweets cloud for our data which shows the data in a cloud representation.

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```
1 his=model.fit(X_train, Y_train, epochs = 5, batch_size=32, verbose = 2, validation_split=0.1)
```

```
Epoch 1/5
4030/4030 - 929s - loss: 0.4511 - accuracy: 0.8536 - val_loss: 0.3755 - val_accuracy: 0.8913
Epoch 2/5
4030/4030 - 924s - loss: 0.3581 - accuracy: 0.8965 - val_loss: 0.3536 - val_accuracy: 0.8976
Epoch 3/5
4030/4030 - 933s - loss: 0.3363 - accuracy: 0.9010 - val_loss: 0.3513 - val_accuracy: 0.9019
Epoch 4/5
4030/4030 - 933s - loss: 0.3180 - accuracy: 0.9050 - val_loss: 0.3549 - val_accuracy: 0.9012
Epoch 5/5
4030/4030 - 922s - loss: 0.3013 - accuracy: 0.9078 - val_loss: 0.3590 - val_accuracy: 0.9010
```

Figure 7: Model Building

The above shown figure is the represents the things related to model building using RNN architecture.

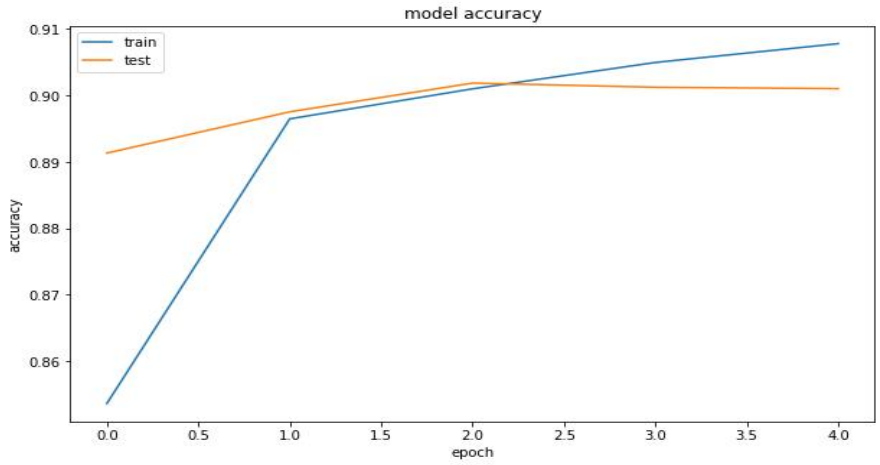

Figure 8: Accuracy Plot

The above shown figure is the accuracy plot for particular model build for the project.

V. CONCLUSION

The study uses a machine learning approach to classify tweets. We utilised the RNN (Recurrent Neural Network Architecture) technique in this case. The suggested RNN architecture is based on neural networks and is trained and evaluated on the acquired dataset.

We will investigate sentiment analysis for COVID-19 among Indians during lockdown in this research. For modelling reasons, we employed RNN, which provided acceptable emotion prediction accuracy. With an accuracy of roughly 90%, the feelings are divided into three groups: positive, neutral, and negative. In the future, we may explore and redesign lockdown 2.0 using fresh data. It might serve as a contrast between lockdown 1.0 and 2.0 emotions.

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