VISVESVARAYA TECHNOLOGICAL UNIVERSITY

JNANASANGAMA, BELAGAVI – 590018

INTERNSHIP REPORT

"SENTIMENT ANALYSIS IN PYTHON ML"

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

Bachelor of Engineering

in

Computer Science and Engineering

Submitted by

G SHREEHARI REDDY

4KM19CS021

Conducted at

Varcons Technologies Pvt Ltd

Varcons Technologies Pvt Ltd

2022-23

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

KARAVALI INSTITUTE OF TECHNOLOGY

MANGALORE-575029

KARAVALI INSTITUTE OF TECHNOLOGY

NEERMARGA, MANGALORE – 575029

(Affiliated to VTU, Belgaum and Recognized by AICTE)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the Internship titled **"Sentiment Analysis of Lockdown in USA During Covid-19, A Study Case On Twitter Using Python ML"** carried out by **Mr.G Shreehari Reddy,** a bonafide student of Karavali Institute of Technology, in partial fulfillment for the award of **Bachelor of Engineering in Computer Science** under Visvesvaraya Technological University, Belagavi, during the year 2022-2023. It is certified that all corrections/suggestions indicated have been incorporated in the report.

The project report has been approved as it satisfies the academic requirements in respect of Internship prescribed for the course Internship / Professional Practice (18CSI85)

Signature of Guide **Signature of HOD** **Signature of Principal**

External Viva:

Name of the Examiner Signature with Date

1)_____

_____

2)_____

_____

D E C L A R A T I O N

I, **G Shreehari reddy**, final year student of Computer Science and Engineering, Karavali Institute of Technology, Mangalore -575029, declare that the Internship has been successfully completed, in **Varcons Technology Pvt Ltd**. This report is submitted in partial fulfillment of the requirements for award of Bachelor Degree in Computer Science and Engineering, during the academic year 2022-2023.

Date : :

Place :

USN : 4KM19CS021

NAME : G Shreehari Reddy

OFFER LETTER

INTERNSHIP OFFER LETTER

Date: **2nd September, 2022**

Name: **G Shreehari Reddy**
USN: **4KM19CS021**

Dear Student,

We would like to congratulate you on being selected for the **Machine Learning With-Python(Research Based)** Internship position with **Varcons Technologies Pvt Ltd**, effective Start Date **2nd September, 2022**, All of us are excited about this opportunity provided to you!

This internship is viewed as being an educational opportunity for you, rather than a part-time job. As such, your internship will include training/orientation and focus primarily on learning and developing new skills and gaining a deeper understanding of concepts of **Machine Learning With Python(Research Based)** through hands-on application of the knowledge you learn while you train with the senior developers. You will be bound to follow the rules and regulations of the company during your internship duration.

Again, congratulations and we look forward to working with you!

Sincerely,

Spoorthi H C
Director
VARCONS TECHNOLOGIES PVT LTD
213, 2st Floor,
18 M G Road, Ulsoor,
Bangalore-560001

A C K N O W L E D G E M E N T

We consider it a privilege whole heartedly to express our gratitude and respect to each and everyone who guided and helped us in the successful completion of this project.

We are grateful to our institution **KARAVALI INSTITUTE OF TECHNOLOGY MANGALORE** for providing us with facilities which has made his project a success.

Our due thanks to **Dr.P RAJENDRA PRASAD** the principal, as we consider ourselves very lucky to have such an excellent computing facilities and their inspiration throughout our professional course.

We express our sincere thanks and wholehearted gratitude to **Asst. Prof.ASHWANI,** who is our respectable head of the department of computer science for given us constant encouragement and support. We wish to acknowledge his help who made our task easy by providing with his valuable help and encouragement.

We express our sincere thanks and wholehearted gratitude **Asst. Prof.ASHWANI,** who is our respectable guide and teacher for giving us constant encouragement, support and valuable guidance throughout the course of the project without whose stable guidance; this project would not have been achieved.

We also thanks the non-teaching staff of computer science department, who guides us the time of difficulties. Finally ,we thanks god those who are involved directly or indirectly in completion of our project.

Name : G Shreehari Reddy
Usn : 4KM19CS021

ABSTRACT

The novel coronavirus disease (COVID-19) has dramatically affected people's daily lives worldwide. More specifically, since there is still insufficient access to vaccines and no straightforward, reliable treatment for COVID-19, every country has taken the appropriate precautions (such as physical separation, masking, and lockdown) to combat this extremely infectious disease.

As a result, people invest much time on online social networking platforms (e.g., Facebook, Reddit, LinkedIn, and Twitter) and express their feelings and thoughts regarding COVID-19. Twitter is a popular social networking platform, and it enables anyone to use tweets. This research used Twitter datasets to explore user sentiment from the COVID-19 perspective.

We used a dataset of COVID-19 Twitter posts from nine states in the United States for fifteen days (from 1 April 2020, to 15 April 2020) to analyze user sentiment. We focus on exploiting machine learning (ML), and deep learning (DL) approaches to classify user sentiments regarding COVID-19. First, we labeled the dataset into three groups based on the sentiment values, namely positive, negative, and neutral, to train some popular ML algorithms and DL models to predict the user concern label on COVID-19.

Additionally, we have compared traditional bag-of-words and term frequency-inverse document frequency (TF-IDF) for representing the text to numeric vectors in ML techniques. Furthermore, we have contrasted the encoding methodology and various word embedding schemes, such as the word to vector (Word2Vec) and global vectors for word representation (GloVe) versions, with three sets of dimensions (100, 200, and 300) for representing the text to numeric vectors for DL approaches. Finally, we compared COVID-19 infection cases and COVID-19-related tweets during the COVID-19 pandemic.

Table of Contents

CHAPTER 1

COMPANY PROFILE

A Brief History of Varcons Technologies Pvt Ltd.

Varcons Technologies Pvt Ltd, was incorporated with a goal ”To provide high quality and optimal Technological Solutions to business requirements of our clients”. Every business is a different and has a unique business model and so are the technological requirements. They understand this and hence the solutions provided to these requirements are different as well. They focus on clients requirements and provide them with tailor made technological solutions. They also understand that Reach of their Product to its targeted market or the automation of the existing process into e-client and simple process are the key features that our clients desire from Technological Solution they are looking for and these are the features that we focus on while designing the solutions for their clients.

Sarvamoola Software Services. is a Technology Organization providing solutions for all web design and development, MYSQL, PYTHON Programming, HTML, CSS, ASP.NET and LINQ. Meeting the ever increasing automation requirements, Sarvamoola Software Services. specialize in ERP, Connectivity, SEO Services, Conference Management, effective web promotion and tailor-made software products, designing solutions best suiting clients requirements.

Vercons Technologies, strive to be the front runner in creativity and innovation in software development through their well-researched expertise and establish it as an out of the box software development company in Bangalore, India. As a software development company, they translate this software development expertise into value for their customers through their professional solutions.

They understand that the best desired output can be achieved only by understanding the clients demand better. Varcons Technologies work with their clients and help them to define their exact solution requirement. Sometimes even they wonder that they have completely redefined their solution or new application requirement during the brainstorming session, and here they position themselves as an IT solutions consulting group comprising of high caliber consultants.

They believe that Technology when used properly can help any business to scale and achieve new heights of success. It helps Improve its efficiency, profitability, reliability; to put itin one sentence ” Technology helps you to Delight your Customers” and that is what we want to achieve.

CHAPTER 2

ABOUT THE COMPANY

Varcons Technologies Pvt Ltd is a Technology Organization providing solutions for all web design and development, MYSQL, PYTHON Programming, HTML, CSS, ASP.NET and LINQ. Meeting the ever increasing automation requirements, Varcons Technologies specialize in ERP, Connectivity, SEO Services, Conference Management, effective web promotion and tailor-made software products, designing solutions best suiting clients requirements. The organization where they have a right mix of professionals as a stake holders to help us serve our clients with best of our capability and with at par industry standards. They have young, enthusiastic, passionate and creative Professionals to develop technological innovations in the field of Mobile technologies, Web applications as well as Business and Enterprise solution. Motto of our organization is to "Collaborate with our clients to provide them with best Technological solution hence creating Good Present and Better Future for our client which will bring a cascading a positive effect in their business shape as well". Providing a Complete suite of technical solutions is not just our tag line, it is Our Vision for Our Clients and for Us, We strive hard to achieve it.

Products of Varcons Technologies Pvt Ltd.

Android Apps

It is the process by which new applications are created for devices running the Android operating system. Applications are usually developed in Java (and/or Kotlin; or other such option) programming language using the Android software development kit (SDK), but other development environments are also available, some such as Kotlin support the exact same Android APIs (and bytecode), while others such as Go have restricted API access.

The Android software development kit includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and zutorials. Currently supported development platforms include computers running Linux (any modern desktop Linux distribution), Mac OS X 10.5.8 or later, and Windows 7 or later. As of March 2015, the SDK is not available on Android itself, but software development is possible by using specialized Android applications.

Web Application

It is a client–server computer program in which the client (including the user interface and client- side logic) runs in a web browser. Common web applications include web mail, online

retail sales, online auctions, wikis, instant messaging services and many other functions. web applications use web documents written in a standard format such as HTML and JavaScript, which are supported by a variety of web browsers. Web applications can beconsidered as a specific variant of client–server software where the client software isdownloaded to the client machine when visiting the relevant web page, using standardprocedures such as HTTP. The Client web software updates may happen each time the web page is visited. During the session, the web browser interprets and displays the pages, andacts as the universal client for any web application. The use of web application frameworks can often reduce the number of errors in a program, both by making the code simpler, and by allowing one team to concentrate on the framework while another focuses on a specified use case. In applications which are exposed to constant hacking attempts on the Internet, security-related problems can be caused by errors in the program.

Frameworks can also promote the use of best practices such as GET after POST. There are some who view a web application as a two-tier architecture. This can be a “smart” client that performs all the work and queries a “dumb” server, or a “dumb” client that relies on a “smart” server. The client would handle the presentation tier, the server would have the database (storage tier), and the business logic (application tier) would be on one of them or on both. While this increases the scalability of the applications and separates the display and the database, it still doesn’t allow for true specialization of layers, so most applications will outgrow this model. An emerging strategy for application software companies is to provide web access to software previously distributed as local applications. Depending on the type of application, it may require the development of an entirely different browser-based interface, or merely adapting an existing application to use different presentation technology. These programs allow the user to pay a monthly or yearly fee for use of a software application without having to install it on a local hard drive. A company which follows this strategy is known as an application service provider (ASP), and ASPs are currently receiving much attention in the software industry.

Security breaches on these kinds of applications are a major concern because it can involve both enterprise information and private customer data. Protecting these assets is an important part of any web application and there are some key operational areas that must be included in the development process. This includes processes for authentication, authorization, asset handling, input, and logging and auditing. Building security into the applications from the beginning can be more effective and less disruptive in the long run.

Web design

It is encompasses many different skills and disciplines in the production and maintenance of websites. The different areas of web design include web graphic design; interface design; authoring, including standardized code and proprietary software; user experience design; and search engine optimization. The term web design is normally used to describe the design process relating to the front-end (client side) design of a website including writing mark up. Web design partially overlaps web engineering in the broader scope of web development. Web designers are expected to have an awareness of usability and if their role involves creating mark up then they are also expected to be up to date with web accessibility guidelines. Web design partially overlaps web engineering in the broader scope of web development.

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Departments and services offered

Varcons Technologies plays an essential role as an institute, the level of education, development of student's skills are based on their trainers. If you do not have a good mentor then you may lag in many things from others and that is why we at Varcons Technologies gives you the facility of skilled employees so that you do not feel unsecured about the academics. Personality development and academic status are some of those things which lie on mentor's hands. If you are trained well then you can do well in your future and knowing its importance of Varcons Technologies always tries to give you the best.

They have a great team of skilled mentors who are always ready to direct their trainees in the best possible way they can and to ensure the skills of mentors we held many skill development programs as well so that each and every mentor can develop their own skills with the demands of the companies so that they can prepare a complete packaged trainee.

Services provided by Varcons Technologies Pvt Ltd.

- Core Java and Advanced Java
- Web services and development
- Dot Net Framework
- Python
- Selenium Testing
- Conference / Event Management Service
- Academic Project Guidance
- On The Job Training
- Software Training

CHAPTER 3

INTRODUCTION

Introduction to ML

This paper examined the Twitter opinion of nine states in the United States (US) on COVID-19 from 1 April to 5 April 2020. In addition, we have developed popular machine learning (ML) and deep learning (DL) models to predict user feelings towards COVID-19 based on tweets.

In ML techniques, we contrasted bag-of-words and term frequency-inverse document frequency (TF-IDF) to describe text to numeric vectors. We compared encoding techniques and two separate word embedding systems (word to vector (Word2vec) and global vectors for word representation (GloVe)) for calculating the numeric vectors from the text (i.e., tweets) in DL techniques. And finally, we performed a comparison between COVID-19 infection cases and COVID-19 related tweets during the COVID-19 pandemic.

Data from social networks are used in analytics to understand human behaviors [11–17]. During the COVID-19 pandemic, general people have faced a significant psychological burden because of long-term financial and social crises. It is essential to analyze public opinion to understand people's sentiments and feelings facing the pandemic.

Problem Statement

1. We examined people's emotions with COVID-19 by considering neutral, positive, and negative labels.

2. We used ML models to calculate the accuracy of various ML approaches to classify the user's feelings about COVID-19 and show that the random forest provides a better result than other ML models.

3. We have expanded our focus on exploring DL models to classify the user's sentiment about COVID-19, compute the DL models' predictive performance, compare the ML models' results, and show that Maximum times DL models provide a better result than ML models.
4. We try to relate COVID-19 outbreak cases and COVID-19-related tweets among the nine states in the USA.

CHAPTER 4

SENTIMENT ANALYSIS

1. Existing System

- Twitter's language model has its own set of properties. Raw tweets typically include much noise, misspelled words, and many abbreviations and slang phrases that limit our model accuracy. To improve accuracy and remove noisy features, we pre-processed the data. The following steps are performed to pre-process the dataset:
- Firstly, we removed all forms of symbols such as #,@,!,$,%,&, HTML tags, and numbers included in the whole dataset. We used a regular expression module from the Python language to perform these steps.
- Our collected dataset contains both lower case and upper case words. We convert all words into lower case words.
- Then, we performed tokenization on our whole text data. Tokenization means the division of smaller units of a comprehensive text document, such as individual terms or phrases .
- Finally, we utilized stemming on our whole text dataset to get clean tweet text. Stem ming is an approach for obtaining the root shape of terms by eliminating their af fixes . We utilized the NLTK library from Python to perform tokenization and stemming.

2. Proposed System

- Feature extraction enhances the performance of trained models by extracting features from input data. We have performed several feature extraction techniques that convert text data into numeric vectors.
- Several classification methods have already been used to analyze user sentiment in online social networks. It is worth noting that the classifiers are primarily associated with (i) ML and (ii) DL techniques. We use eight classification models in this study, including six ML and two DL classifiers as described below
- We used several ML algorithms in our study description as below. Logistic Regression (LR): LR is a statistical method that employs a logistic equation in its simplest form that describes a binary dependent variable. However, there are many.

3. Objective of the System

- We used TF-IDF and bag-of-words to convert our tweets into numeric vectors to construct machine learning models. While using both TF-IDF and bag-of-words, we ignored terms that appeared less than 1000 times in the documents. We used the Adam optimization algorithm to train deep learning models, which incorporate two stochastic gradient descent extensions such as AdaGrad and RMSProp. Furthermore, we used ReLUs activation functions, sparse_categorical_crossentropy for the loss function, and the softmax activation function for ternary classification

CHAPTER 5

REQUIREMENT ANALYSIS

Hardware Requirement Specification

Matching rules based sentiment analysis: There is a predefined list of words for each type of sentiment needed and then the text or document is matched with the lists. The algorithm then determines which type of words or which sentiment is more prevalent in it.
This type of rule based sentiment analysis is easy to implement, but lacks flexibility and does not account for context.

Automatic sentiment analysis: They are mostly based on supervised machine learning algorithms and are actually very useful in understanding complicated texts. Algorithms in this category include support vector machine, linear regression, rnn, and its types. This is what we are gonna explore and learn more about.

Software Requirement Specification

We are going to code all this up in a jupyter notebook on google colab to make use of the free gpu. If you follow along on your own system everything will be pretty much the same except for mounting the google drive for use as a persistent storage option.

We are going to use pytorch for this project and luckily it comes preinstalled with some functionalities for helping us speeding up our work

The torch.text library is a great tool for nlp projects. It has a loader for some common nlp datasets like the one we are going to use today, also complete pipeline for abstraction of vectorization of data, data loaders and iteration of data.

CHAPTER 6

DESIGN ANALYSIS

Recurrent neural networks or RNNs are the go-to method for sequential data. Recurrent neural networks have a memory of their own and remember the input that was given to each node. In a normal feed forward neural network data or information given in the form of input moves forward and never moves backward in any nodes, from the input layer to the hidden layer and out from the output layer. Because these kinds of networks have no memory they do not remember the last input or predict the next input.

What a recurrent neural network does is creates a copy of the output and loops it back through the network. For example when a sentence is passed through a feedforward network and it takes it word by word, till it reaches the last word. It has no memory of what was fed to it before that. But rnns know the previous inputs as well and can thus also predict what can come next. They are widely used in sequential data.

Recurrent neural networks are not new, were first introduced in the 1980s, but have become a lot popular with the growth of deep learning and its use in sequential data. Still, rnn have their own set of problems, one of the major ones being the vanishing gradient problem. The answer to that being the lstm model.

The first parameter, our tokenizer(that determines how the sentences are going to be broken down or tokenized in nlp standard) is spacy, which is a powerful tool for one line tokenization. We recommend using this, but the default is just tokenizing the string based on blank spaces. Also we need to tell the spacy tokenizer which language model to use for the task.

We also set the random seed to a certain number, which could be any but we mention it just for reproducibility purposes. You could change it or even omit it without any significant effect. We also want to use cuda and also the gpu available to us so we use swt that as well.

Now we print some details about our model. Getting the number of trainable parameters that are present there in the model.

We then get the pre-trained embedding weights and copy them to our model so that it does not need to learn the embeddings, and can directly focus on the job at hand that is learning the sentiments related to those embeddings.

DESIGN & ANALYSIS

Training of the model

We now begin the necessary functions for training and evaluation of sentiment analysis model.

The first one being the binary accuracy function, which we'll use for getting the accuracy of the model each time.

We define the function for training and evaluating the models. The process here is standard. We start by looping through the number of epochs and the number of iterations in each epoch is according to the batch size that we defined. We pass the text to the model, get the predictions from it, calculate the loss for each iteration and then backward propagate that loss.

Twitter's language model has its own set of properties. Raw tweets typically include much noise, misspelled words, and many abbreviations and slang phrases that limit our model accuracy. To improve accuracy and remove noisy features, we pre-processed the data. The following steps are performed to pre-process the dataset:

1. Firstly, we removed all forms of symbols such as #,@,!,$,%,&, HTML tags, and numbers included in the whole dataset. We used a regular expression module from the Python language to perform these steps.

2. Our collected dataset contains both lower case and upper case words. We convert all words into lower case words.

3. Then, we performed tokenization on our whole text data. Tokenization means the division of smaller units of a comprehensive text document, such as individual terms or phrases [38].

4. Finally, we utilized stemming on our whole text dataset to get clean tweet text. Stemming is an approach for obtaining the root shape of terms by eliminating their affixes [39]. We utilized the NLTK library from Python to perform tokenization and stemming.

Sentiment Analysis Analyzing a text and evaluating its sentiment is known as sentiment analysis. The aim is to assess whether or not user text conveys positive, negative, or neutral sentiments. We use the TextBlob library, which can process these three types of classification [40].

To get classification, textblob provides polarity(P) and subjectivity(S) value. When the polarity value is greater than 0 ($p > 0$), it is positive, and it is neutral when the polarity value is equal to 0 ($p = 0$). Otherwise, it is negative.

The subjectivity is a floating-point integer of [0.0, 1.0], with 0.0 being highly objective and 1.0 being highly subjective. Each tweet is labeled with sentiments after these measures are completed. For the sentiment label results, we can take some real-life examples of COVID-19. Let us consider the tweets tweet1 and tweet2 in Example 1 and Example 2 to deal with which label they belong to. More precisely, the probability of positive, negative, and neutral statements is shown below.

This section presents evaluation metrics in accuracy, precision, recall, and f1-score—further, a brief discussion of the results is made.
Setup for the Experiment We utilized the Keras deep learning platform in the experiments, which uses Tensorflow [23] for deep learning method implementation as a back-end. We trained our model using Google Colab, a free cloud service with a free GPU (Graphics processing unit) that comes in handy when working with big datasets.
Parameters Setting We used TF-IDF and bag-of-words to convert our tweets into numeric vectors to construct machine learning models. While using both TF-IDF and bag-of-words, we ignored terms that appeared less than 1000 times in the documents. We used the Adam optimization algorithm to train deep learning models, which incorporate two stochastic gradient descent extensions such as AdaGrad and RMSProp. Furthermore, we used ReLUs activation functions, sparse_categorical_crossentropy for the loss function, and the softmax activation function for ternary classificatio

CHAPTER 7

IMPLEMENTATION

Implementation is the stage where the theoretical design is turned into a working system. The most crucial stage in achieving a new successful system and in giving confidence on the new system for the users that it will work efficiently and effectively.

The system can be implemented only after thorough testing is done and if it is found to work according to the specification. It involves careful planning, investigation of the current system and it constraints on implementation, design of methods to achieve the change over and an evaluation of change over methods a part from planning.

Two major tasks of preparing the implementation are education and training of the users and testing of the system. The more complex the system being implemented, the more involved will be the system analysis and design effort required just for implementation.

The implementation phase comprises of several activities. The required hardware and software acquisition is carried out. The system may require some software to be developed. For this, programs are written and tested. The user then changes over to his new fully tested system and the old system is discontinued.

TESTING

The testing phase is an important part of software development. It is the Information zed system will help in automate process of finding errors and missing operations and also a complete verification to determine whether the objectives are met and the user requirements are satisfied. Software testing is carried out in three steps:

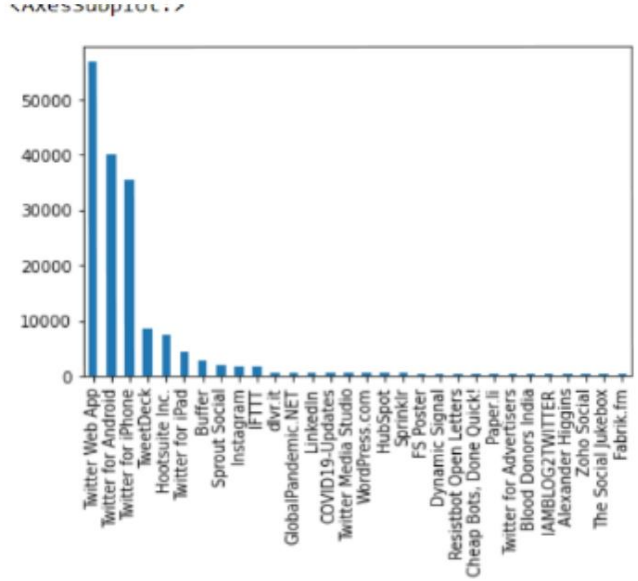
1. The first includes unit testing, where in each module is tested to provide its correctness, validity and also determine any missing operations and to verify whether theobjectives have been met. Errors are noted down and corrected immediately.
2. Unit testing is the important and major part of the project. So errors are rectified easily in particular module and program clarity is increased. In this project entire system is dividedinto several modules and is developed individually. So unit testing is conducted to individual modules.
3. The second step includes Integration testing. It need not be the case, the software whose modules when run individually and showing perfect results, will also show perfect results when run as a whole.

CHAPTER 8

SNAPSHOTS

Out[21]:

	user_name	user_location	user_description	user_created	user_followers	user_friends	user_favourites	user_verified	date	text
0	‘Ÿï¿½ï¿½	astroworld	wednesday addams as a disney princess keepin i...	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...
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...
2	Time4fisticuffs	Pewee Valley, KY	#Christian #Catholic #Conservative #Reagan #Re...	2009-02-28 18:57:41	9275	9525	7254	False	2020-07-25 12:27:14	@diane3443 @wdunlap @realDonaldTrump Trump nev...
3	ethel meitz	Stuck in the Middle	#Browns #Indians #ClevelandProud #[L]! #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...
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...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Twitter Web App
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TweetDeck
Hootsuite Inc.
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Buffer
Sprout Social
Instagram
IFTTT
dlvr.it
GlobalPandemic.NET
LinkedIn
COVID19-Updates
Twitter Media Studio
WordPress.com
HubSpot
Sprinklr
FS Poster
Dynamic Signal
Resistbot Open Letters
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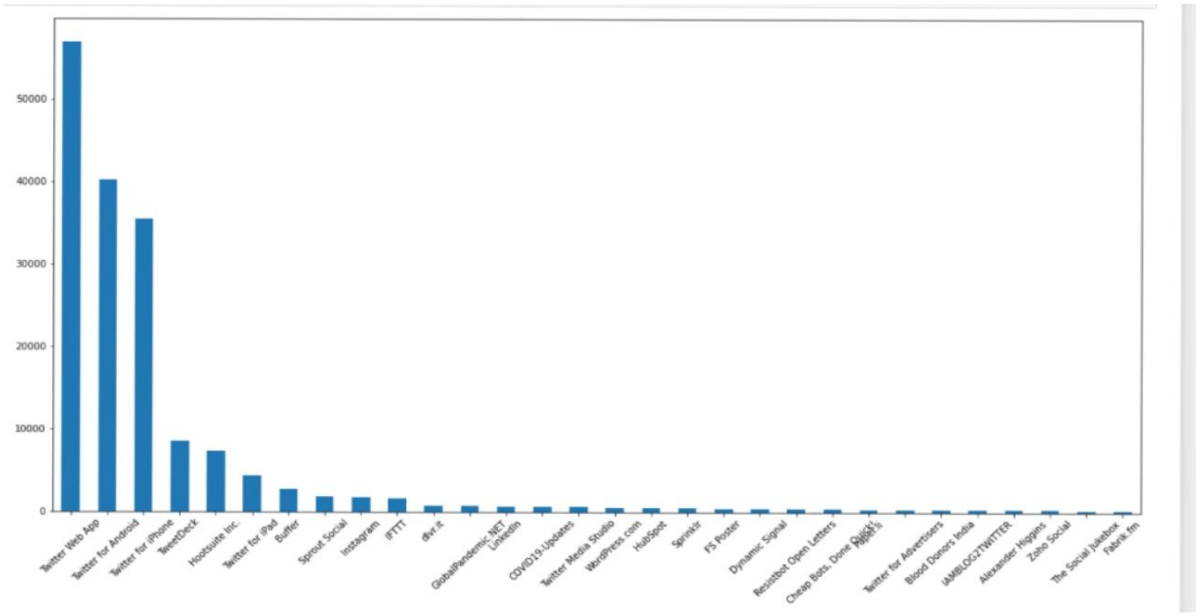
Blood Donors India
IAMBLOG2TWITTER
Alexander Higgins
Zoho Social
The Social Jukebox
Fabrik.fm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Instagram
IFTTT
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GlobalPandemic.NET
LinkedIn
COVID19-Updates
Twitter Media Studio
WordPress.com
HubSpot
Sprinklr
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Blood Donors India
IAMBLOG2TWITTER
Alexander Higgins
Zoho Social
The Social Jukebox
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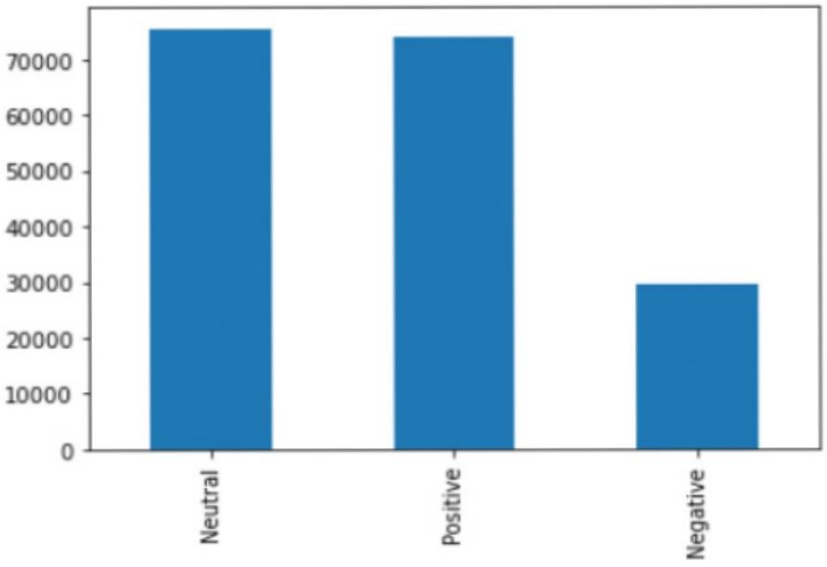
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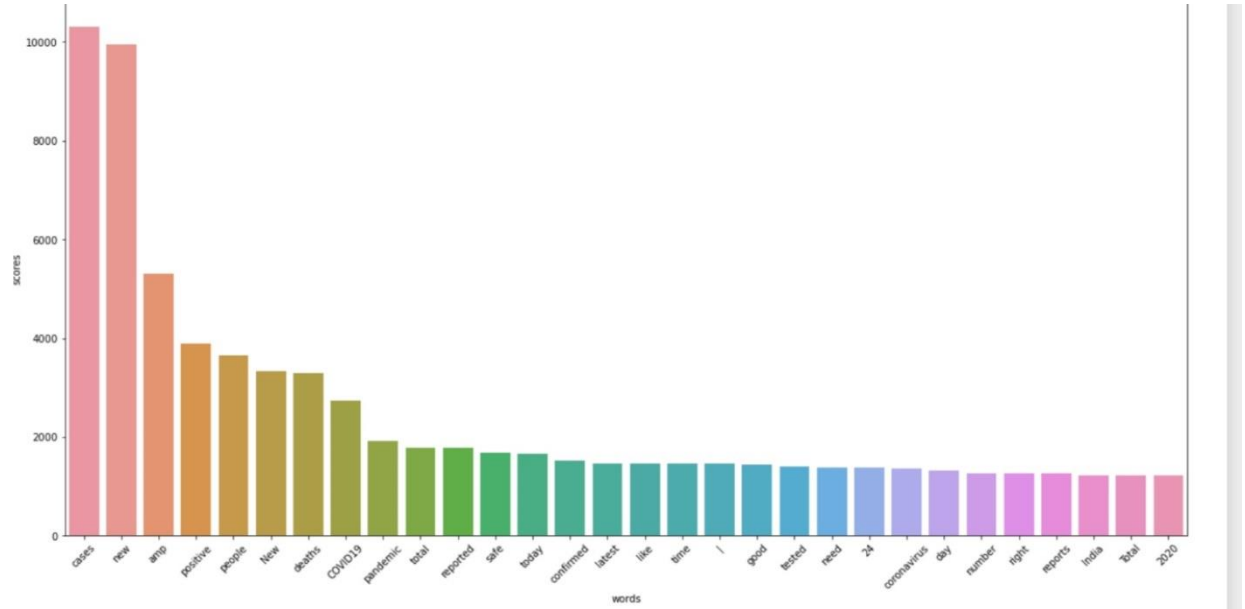
Positive
Negative



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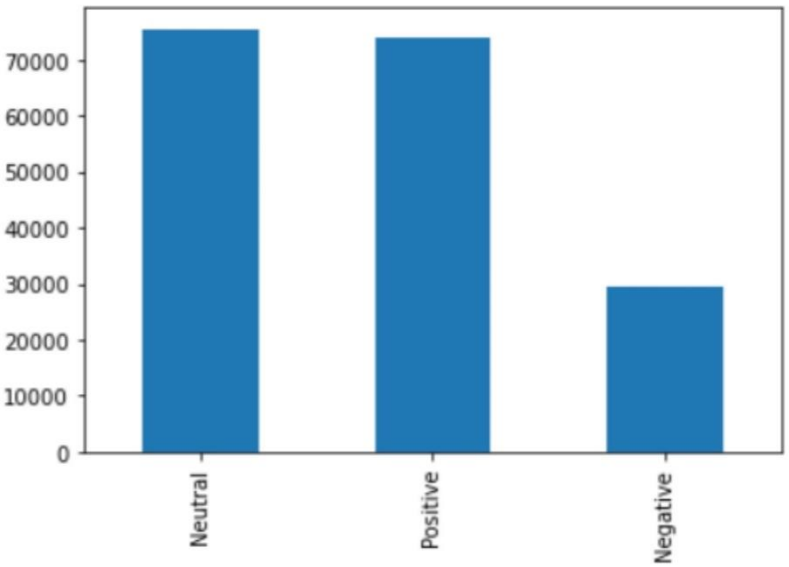

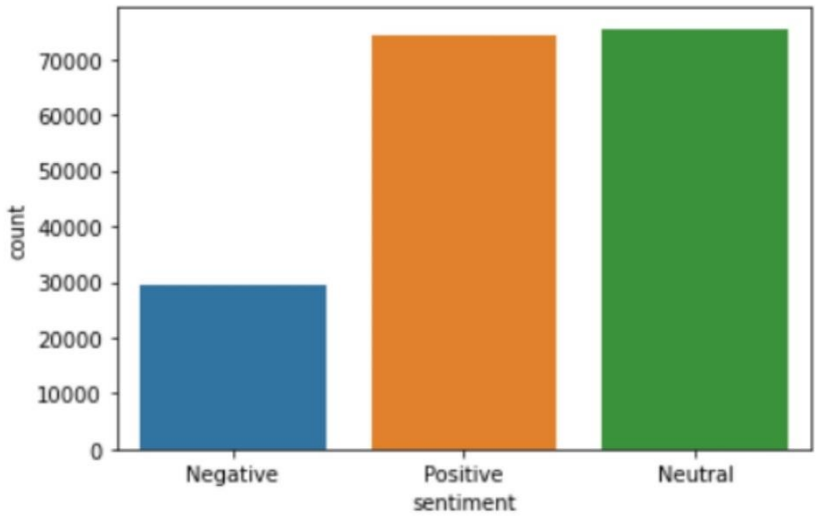

CHAPTER 9

CONCLUTION

The package was designed in such a way that future modifications can be done easily. The following conclusions can be deduced from the development of the project:

- Automation of the entire system improves the efficiency
- It provides a friendly graphical user interface which proves to be better when compared to the existing system.
- It gives appropriate access to the authorized users depending on their permissions.
- It effectively overcomes the delay in communications.
- Updating of information becomes so easier
- System security, data security and reliability are the striking features.
- The System has adequate scope for modification in future if it is necessary.

We have successfully developed python sentiment analysis model based on lstm techniques that is pretty robust and highly accurate. As discussed earlier, sentiment analysis has many use-cases based on requirements we can use it. We can similarly train it on any other kind of data just by changing the dataset according to our needs. We can use this sentiment analysis model in all different ways possible.

REFERENCE

1. Wang, H.; Wang, Z.; Dong, Y.; Chang, R.; Xu, C.; Yu, X.; Zhang, S.; Tsamlag, L.; Shang, M.; Huang, J. Others Phase-adjusted estimation of the number of coronavirus disease 2019 cases in Wuhan, China. Cell Discover. 2020, 6, 10. [CrossRef] [PubMed]

2. World Health Organization. Novel Coronavirus (2019-nCoV): Situation Report. Available online: https://www.who.int/docs/ default-source/coronaviruse/situation-reports/20200207-sitrep-18-ncov.pdf?sfvrsn=fa644293_2/ (accessed on 9 February 2020).

3. Twitter Usage Statistics. Internet Live Stats Website. Available online: http://www.internetlivestats.com/twitter-statistics/ (accessed on 11 October 2016).

4. Soriano, C.; Roldan, M.; Cheng, C.; Oco, N. Social media and civic engagement during calamities: The case of Twitter use during typhoon Yolanda. Philipp. Political Sci. J. 2016, 37, 6–25. [CrossRef]

5. Van Lent, L.; Sungur, H.; Kunneman, F.; Van De Velde, B.; Das, E. Too far to care? Measuring public attention and fear for Ebola using Twitter. J. Med Internet Res. 2017, 19, e193. [CrossRef] [PubMed]

6. Nair, M.; Ramya, G.; Sivakumar, P. Usage and analysis of Twitter during 2015 Chennai flood towards disaster management. In Proceedings of Procedia Computer Science, Cochin, India, 22–24 August 2017; pp. 350–358.

7. Fu, K.; Liang, H.; Saroha, N.; Tse, Z.; Ip, P.; Fung, I. How people react to Zika virus outbreaks on Twitter? A computational content analysis. Am. J. Infect. Control 2016, 44, 1700–1702. [CrossRef]

8. Pang, B.; Lee, L. Opinion mining and sentiment analysis Foundations and Trends. Inf. Retr. 2008, 2, 1–2.

Referenced github

https://github.com/Jcharis/DataScienceTools/tree/master/Data_Analysis_of_Covid19_Tweets

https://github.com/gabrielpreda/covid-19-tweets