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19MAT105-MATHEMATICS FOR INTELLIGENT SYSTEM 1

SENTIMENT ANALYSIS OF TWITTER DATA USING LOGISTIC REGRESSION

GROUP 6

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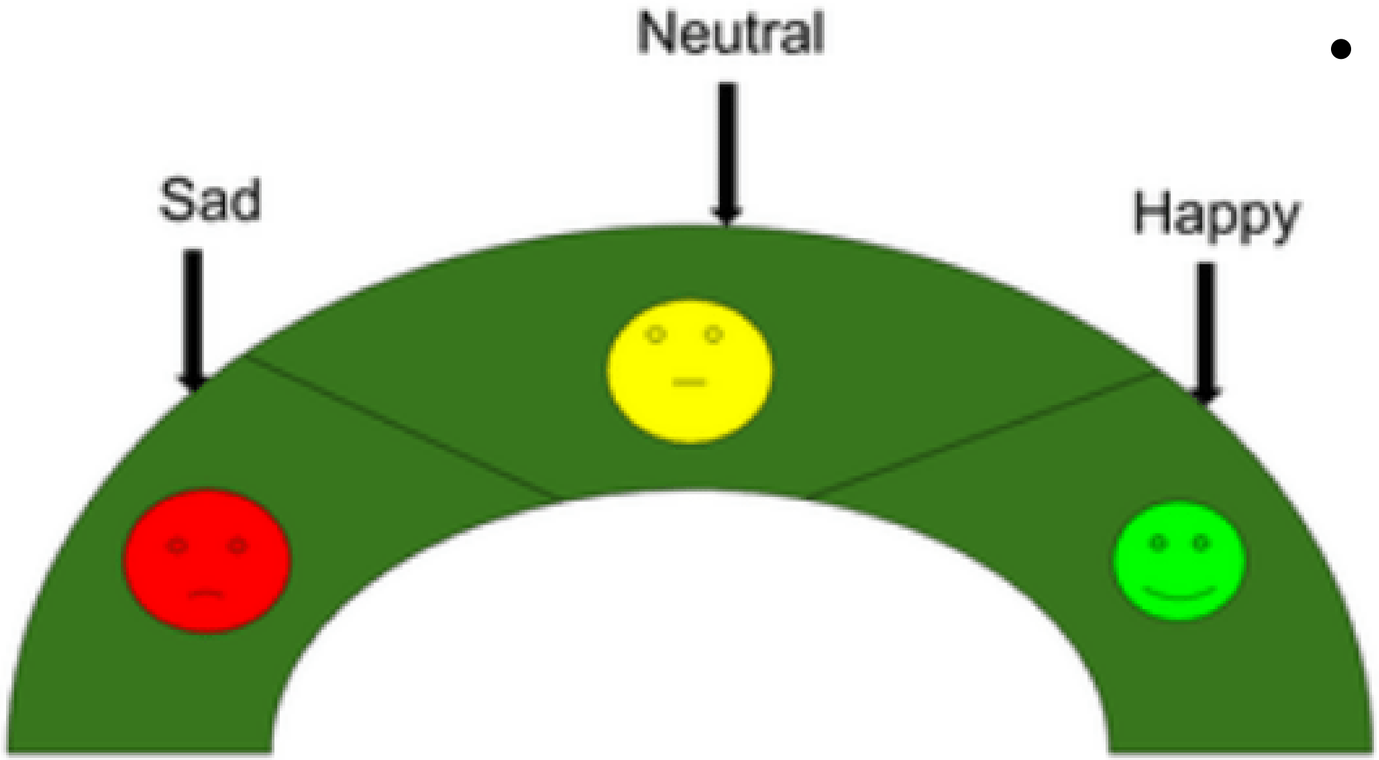
INTRODUCTION

- The dramatic increase in internet usage around the world has increased the volume of feedback data making it difficult to organize and classify sentiments.
- Sentiment analysis also referred to as opinion mining, is a sub-machine learning task where we want to determine which is the general sentiment of a given document.
- For example, it has always been a great use for businesses to gain more meaningful insights from their feedback data, which will help them to improve their products and make it easier for customers to select the proper product in less time.

- The main goal of sentiment analysis is to classify and determine the polarity of material on the Internet.
- We use LOGISTIC REGRESSION for the effective accuracy and the prediction of the data set.
- Logistic Regression is a Machine Learning algorithm that is used for classification problems, it is a predictive analysis algorithm based on the concept of probability.

Background Information



- Sentiment analysis is the process of classifying whether a block of text is positive, negative, or neutral. Sentiment analysis is contextual mining of words that indicates the social sentiment of a brand.
- The goal which Sentiment analysis tries to gain is to analyze people's opinions in a way that can help the businesses expand. It focuses not only on polarity (positive, negative & neutral) but also on emotions (happy, sad, angry, etc.).

Why perform Sentiment Analysis?

According to the survey, 80% of the world's data is unstructured. The data needs to be analyzed and be in a structured manner whether it is in the form of emails, texts, documents, articles, and many more.

- Sentiment Analysis is required as it stores data in an efficient, cost-friendly.

- Sentiment analysis solves real-time issues and can help you solve all the real-time scenarios.

WHY DO WE NEED SENTIMENT ANALYSIS ?

Track sentiments real-time

Monitor brand perception

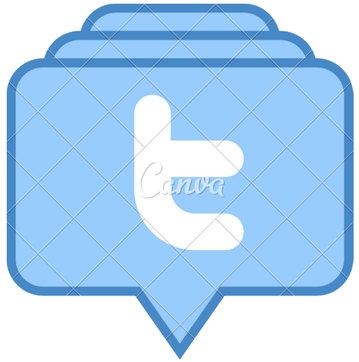
Do better marketing campaigns

Boost your products and services

Improve customer service

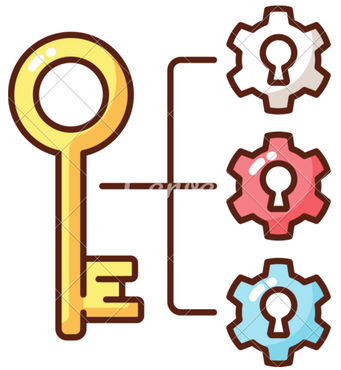
SOLUTION APPROACH

As a part of building a sentiment classifier using logistic regression, we train the model on the Twitter sample dataset.



Thus we do some data pre-processing and cleaning to break down it to an easily understandable format.

The dataset available is in its natural format of tweets(hard for a model to understand).

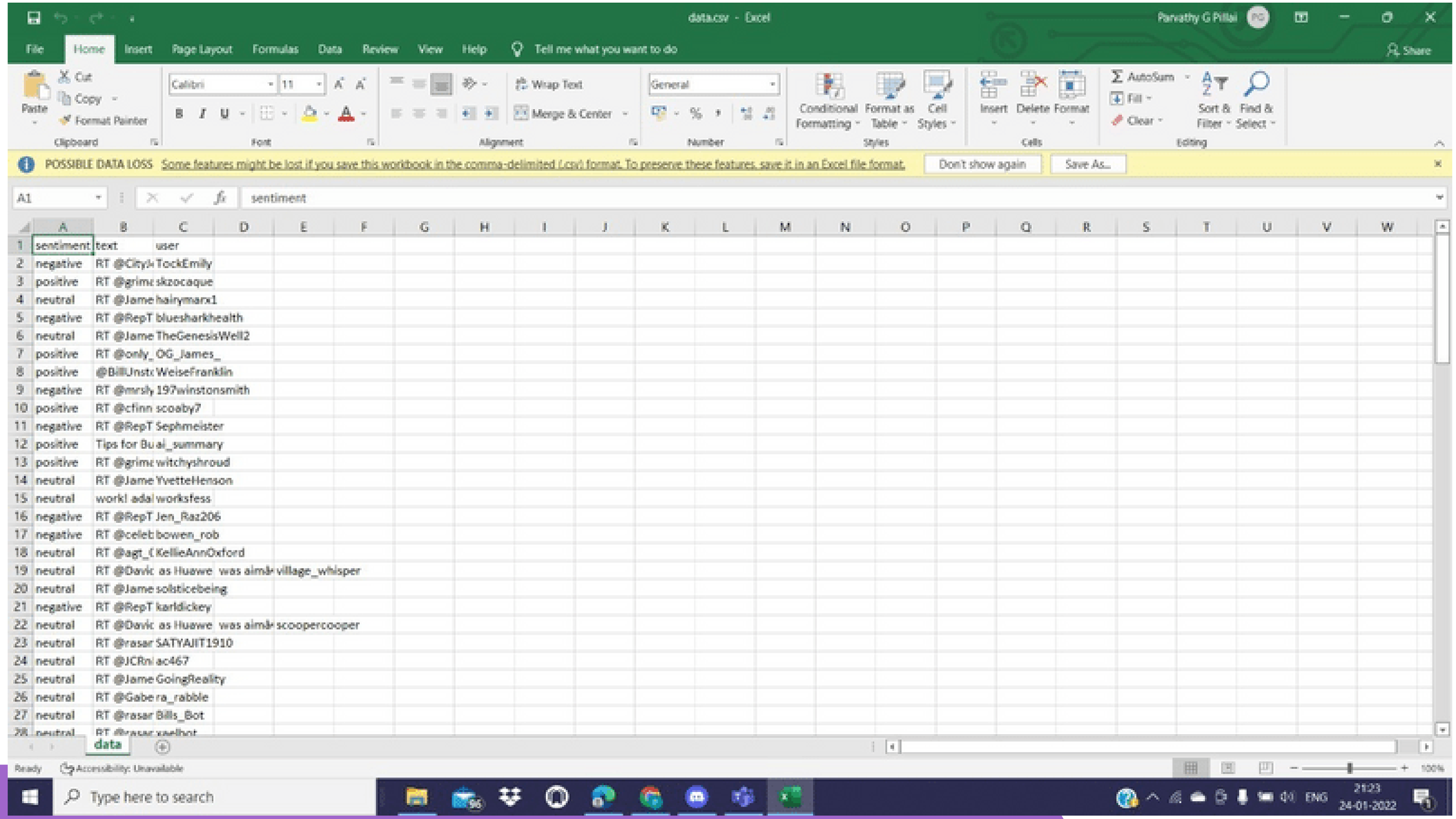


Pre-processing of tweets includes the following steps:

1. Removing punctuations , hyperlinks, and hashtags
2. Tokenization — Converting a sentence into a list of words
3. Removing stop words like and, is, on...
4. Converting all the words to lower cases
5. Lemmatization /stemming — Transforming a word to its root word

After preprocessing the tweets, it is converted into a feature vector.

DATASET


data.csv - Excel
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Share
Paste Cut Copy Format Painter
Calibri 11
Wrap Text Merge & Center
General
Conditional Formatting Format as Table Cell Styles
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AutoSum Fill Clear
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POSSIBLE DATA LOSS Some features might be lost if you save this workbook in the comma-delimited (.csv) format. To preserve these features, save it in an Excel file format.
Don't show again
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positive RT @grimc skzocaque
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positive @BillUnstc WeiseFranklin
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positive RT @grimc witchyshroud
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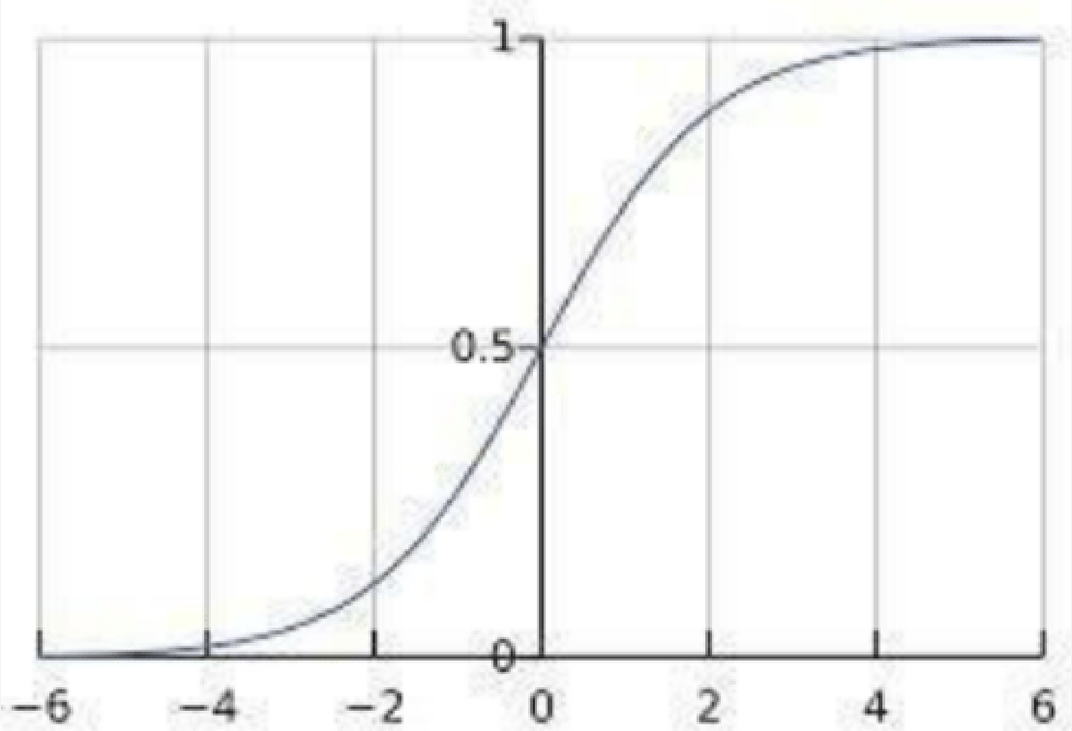
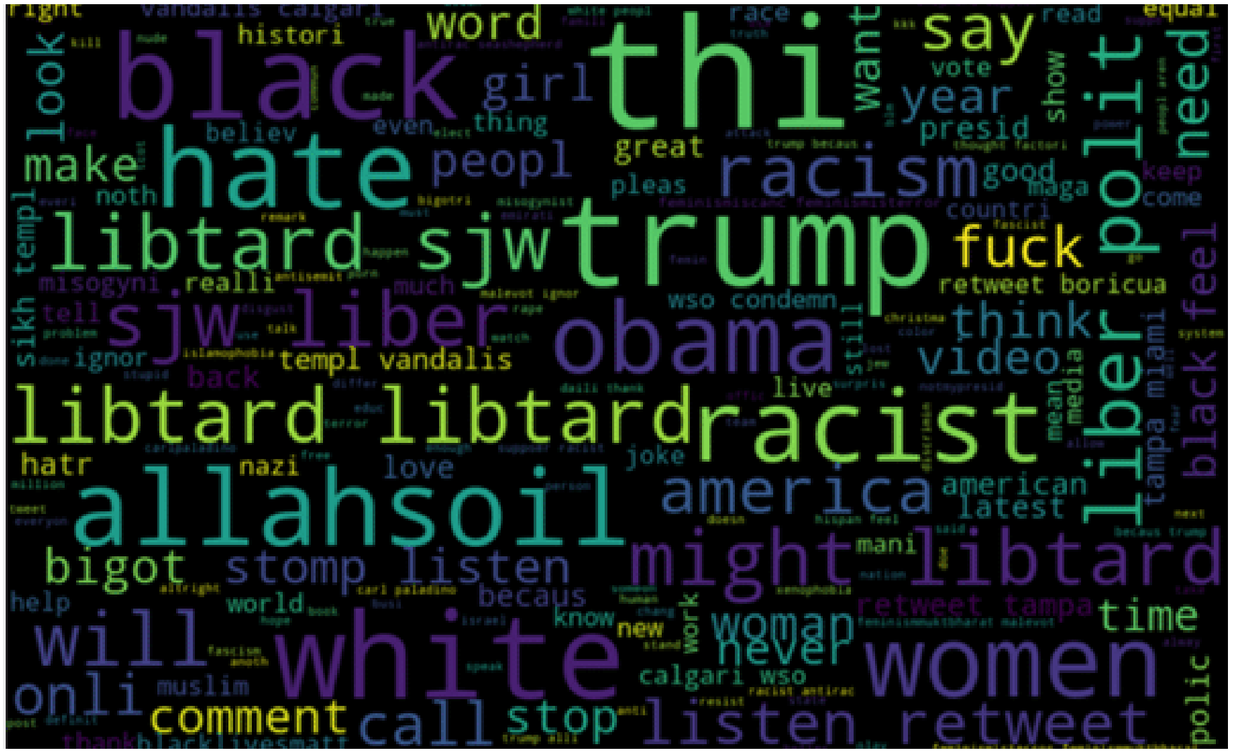
IMPLEMENTATION

- The objective of this task is to detect hate speech in tweets.
- The algorithm used is logistic regression.
- To predict the tweets into negative and positive, we have used a dataset with probability value 0 for negative and 1 for positive
- Logistic regression, uses a logistic function, for instance, a sigmoid function to estimate probabilities between positive or negative tweets



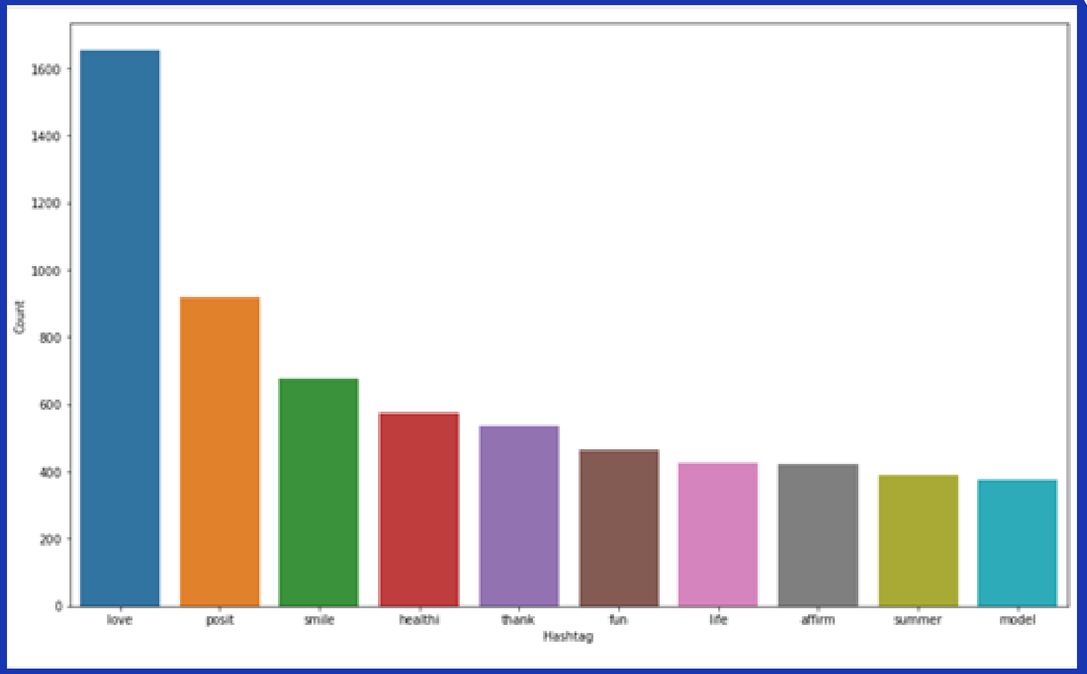
Frequent words visualization for +ve

Frequent words of visualization for -ve

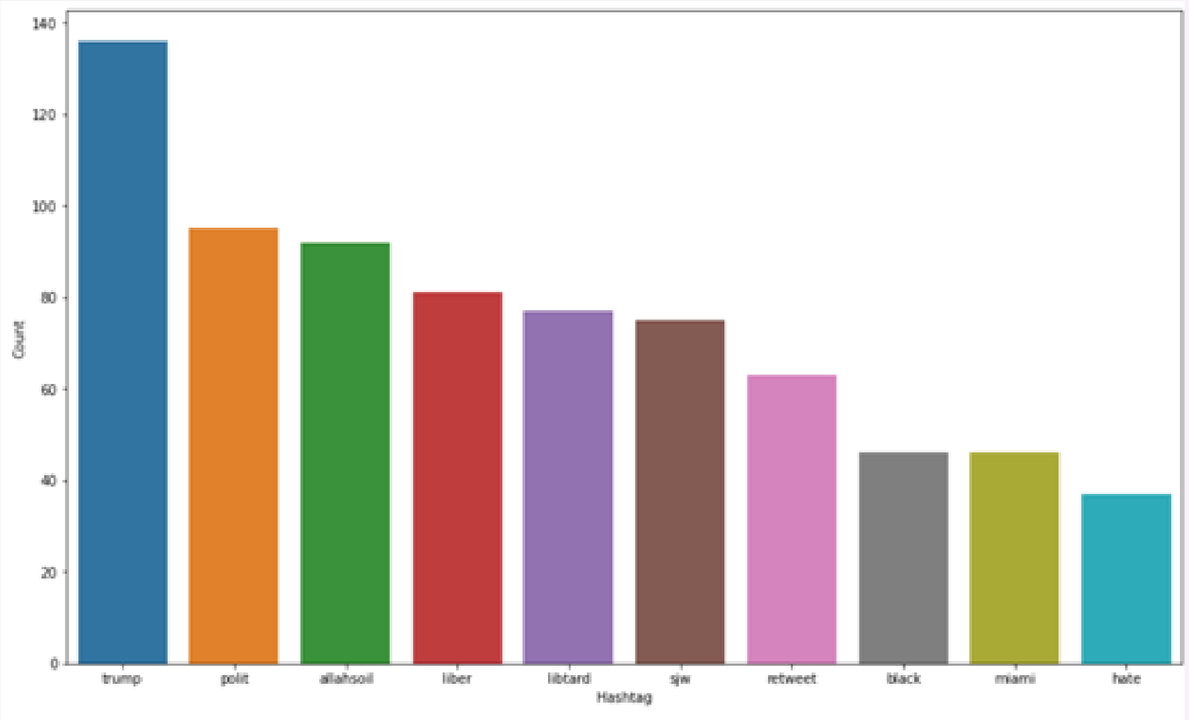


GitHub link :

https://github.com/ANUSHKALA/Twitter_Sentimental_Analysis/tree/main

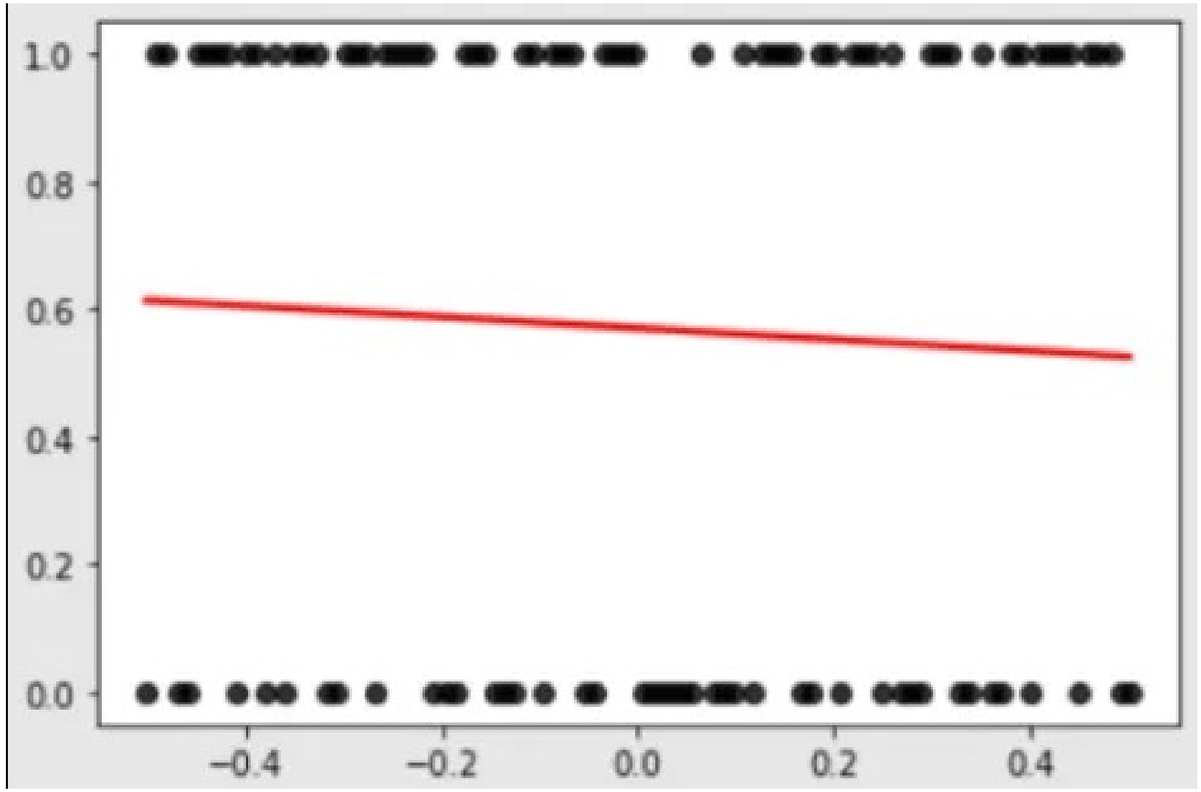


Top 10 hashtags (+ ve)

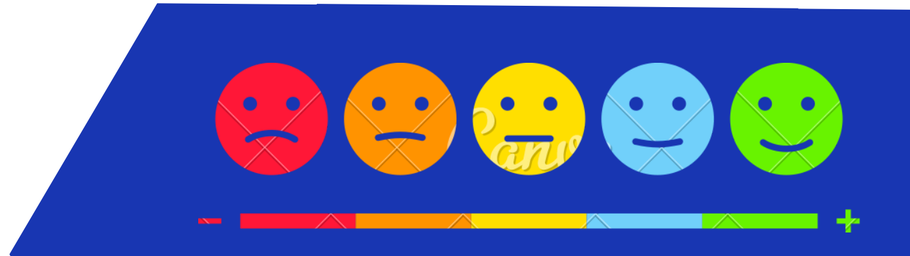


Top 10 hashtags (- ve)

RESULT



Hence we used Logistic regression to classify the tweets as positive and negative.Given below is the graph we obtained during implementation.The Logistic regression model's accuracy is 0.9950



REFERENCE

- https://www.researchgate.net/publication/325101249_Sentiment_Analysis_using_Logistic_Regression_and_Effective_Word_Score_Heuristic
- https://www.brandwatch.com/blog/understanding-sentiment-analysis/#:~:text=Sentiment%20analysis%20is%20extremely%20useful,public%20opinion%20behind%20certain%20topics.&text=Being%20able%20to%20quickly%20see,and%20plan%20for%20the%20future?utm_source=canva&utm_medium=iframely
- https://www.freecodecamp.org/news/what-is-sentiment-analysis-a-complete-guide-to-for-beginners/#:~:text=Sentiment%20analysis%20is%20a%20technique,(NLP)%20to%20achieve%20this.?utm_source=canva&utm_medium=iframely
- https://www.pyoneer.io/post/5-reasons-why-sentiment-analysis-is-important/?utm_source=linkedinstefan&utm_medium=linkedinarticle&utm_campaign=realreasonwhysentiment&utm_source=canva&utm_medium=iframely&utm_source=canva&utm_medium=iframely
- https://joannatrojak.medium.com/sentiment-analysis-with-logistic-regression-in-python-with-nltk-library-d5030b1d84e3

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Thank you!

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