

SENTIMENTAL ANALYSIS

Submitted in partial fulfillment of the requirements
of the degree **BACHELOR OF ENGINEERING**
IN COMPUTER ENGINEERING

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CERTIFICATE

This is to certify that, the Mini project entitled “**Sentimental Analysis**” is bonafide work of **Mr.Shubham yadav (137), Mr.ujjawal singh(120), Mr.Atul Shukla(115)** submitted to the University of Mumbai in fulfillment of the requirement for the Miniproject Semester- VII project work of Second year computer engineering at Universal College of Engineering, Vasai, Mumbai at the department of Computer Engineering, in the academic Year 2022-2023, Semester –VII.

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Mini Project Approval

This Mini Project entitled “**SENTIMENTAL ANALYSIS APP**” By **Mr. Shubham yadav (137), Mr. Atul Shukla(115), Mr.Ujjwal Singh(120)** approved for the degree of **Bachelor of Engineering in Computer Engineering.**

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(Internal Examiner Name & Sign)

2.....
(External Examiner name & Sign)

Date:
Place:

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Abstract

Sentiment analysis or opinion mining is the computational study of people's opinions, sentiments, attitudes, and emotions expressed in written language. It is one of the most active research areas in natural language processing and text mining in recent years. Its popularity is mainly due to two reasons. First, it has a wide range of applications because opinions are central to almost all human activities and are key influencers of our behaviors. Whenever we need to make a decision, we want to hear others' opinions. Second, it presents many challenging research problems, which had never been attempted before the year 2000. Part of the reason for the lack of study before was that there was little opinionated text in digital forms. It is thus no surprise that the inception and the rapid growth of the field coincide with those of the social media on the Web. In fact, the research has also spread outside of computer science to management sciences and social sciences due to its importance to business and society as a whole. In this talk, I will start with the discussion of the mainstream sentiment analysis research and then move on to describe some recent work on modeling comments, discussions, and debates, which represents another kind of analysis of sentiments and opinions.

Acknowledgment

We take this opportunity to express our deep sense of gratitude to our project guide and project coordinator guide **Mrs. Priyanka Patil**, for her continuous guidance and encouragement throughout the duration of our project work. It is because of her experience and wonderful knowledge. We can fulfill the requirement of completing the project within the stipulated time. We would also like to thank **Dr. Jitendra Saturwar**, head of computer engineering department for his encouragement, whole-hearted cooperation and support.

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List of Abbreviations

MCQ	Multiple Choice Question
E-learning	Electronic learning
M-learning	Mobile learning
App	Application
Math's	Mathematics
MMLS	Micro lecture mobile learning system
Pc	Personal computer
Web	World wide web
SE	Standard Edition
RAM	Random Access Memory
GB	Gigabyte
(AVD)	Android Virtual Device
USB	Universal Serial BUS
XML	Extensible Markup Language
SQL	Structured Query Language
ANSI	American National Standards Institute
RDMS	Relational Database Management Systems
GPL	General Public License (GPL)
IDE	integrated development environment

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List of Symbols

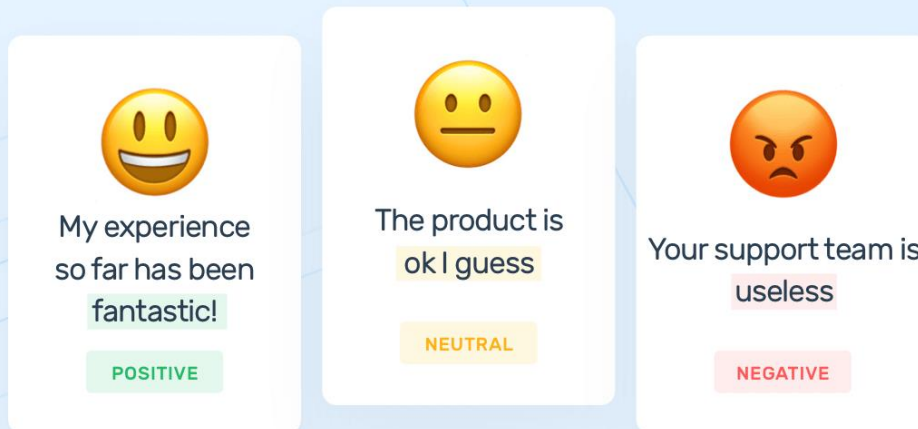
(Round open Bracket
)	Round closed Bracket
[Square open Bracket
]	Square closed Bracket
-	Subtraction
+	Addition
/	Division
:	Colon
=	Equal
"	Double inverted comma
'	Single inverted comma
×	Multiplication
%	percentage

1. Introduction

Sentiment analysis (or opinion mining) is a natural language processing (NLP) technique used to determine whether data is positive, negative or neutral. Sentiment analysis is often performed on textual data to help businesses monitor brand and product sentiment in customer feedback, and understand customer needs.

Our day-to-day life has always been influenced by what people think. Ideas and opinions of others have always affected our own opinions. The explosion of Web 2.0 has led to increased activity in Podcasting, Blogging, Tagging, Contributing to RSS, Social Bookmarking, and Social Networking. As a result there has been an eruption of interest in people to mine these vast resources of data for opinions. Sentiment Analysis or Opinion Mining is the computational treatment of opinions, sentiments and subjectivity of text. In this report, we take a look at the various challenges and applications of Sentiment Analysis. We will discuss in details various approaches to perform a computational treatment of sentiments and opinions. Various supervised or data-driven techniques to SA like Naïve Bayes, Maximum Entropy, SVM, and Voted Perceptrons will be discussed and their strengths and drawbacks will be touched upon. We will also see a new dimension of analyzing sentiments by Cognitive Psychology mainly through the work of Janyce Wiebe, where we will see ways to detect subjectivity, perspective in narrative and understanding the discourse structure. We will also study some specific topics in Sentiment Analysis and the contemporary works in those areas.

Sentiment Analysis



Emotion classification, or emotion categorization, is the task of recognising emotions to classify them into the corresponding category. Given an input, classify it as 'neutral or no emotion' or as one, or more, of several given emotions that best represent the mental state of the subject's facial expression, words, and so on.

Emotion classification attempts to detect the emotional content in the input text and based on different approaches establish what kind of emotional content is present, if any. Textual emotion classification relies mainly on linguistic resources and it introduces many challenges to assignment of text to emotion represented by a proper model. A crucial part of each emotion detector is emotion model.

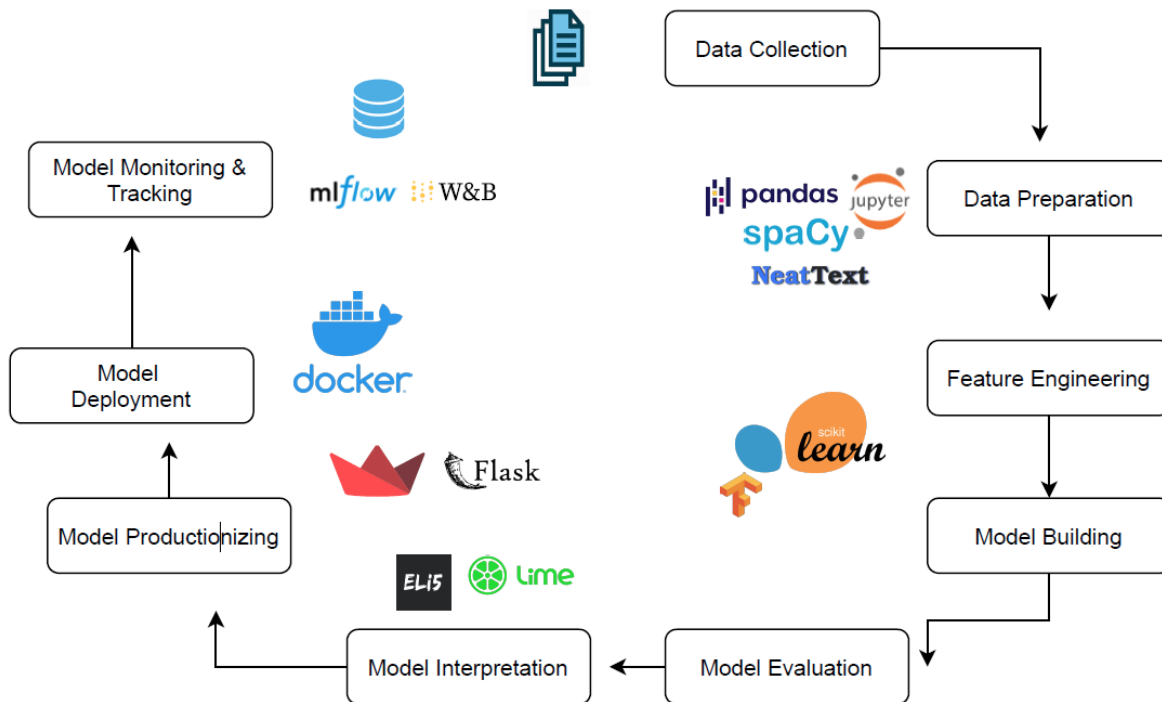
2. Literature survey

Sentiment Analysis (SA) is an ongoing field of research in text mining field. SA is the computational treatment of opinions, sentiments and subjectivity of text. This survey paper tackles a comprehensive overview of the last update in this field. Many recently proposed algorithms' enhancements and various SA applications are investigated and presented briefly in this survey. These articles are categorized according to their contributions in the various SA techniques. The related fields to SA (transfer learning, emotion detection, and building resources) that attracted researchers recently are discussed. The main target of this survey is to give nearly full image of SA techniques and the related fields with brief details. The main contributions of this paper include the sophisticated categorizations of a large number of recent articles and the illustration of the recent trend of research in the sentiment analysis and its related areas.

PAPER NAME	YEAR OF PUBLICATION	AUTHOR	PUBLICATION	PROPOSED WORK	RESEARCH GAP
Emotion Classifier on Android Platform (MQAP)	2019	Hana Esmaeel	ICCES	Emotion Classification on Android Platform	Complicated System and requires updating of questions I.e. Quantity of questions are Less
Real-Time Sentiment Analysis Of Twitter Posts	2020	Anupama BS; Rakshith D B; Rahul Kumar M	Tagreed Kattoua et al International Journal of Business Management and Research	build a sentiment classification for the tweets	The system is for outcome of the analysis is depicted for positive, negative, and neutral remarks about their opinions using visualization techniques such as histogram and Pie chart

Sentiment Analysis of Twitter Data in Online Social Network	2021	Sruthi P, Dr. Sangeeta Mukherjee	International Journal of Scientific & Technology Research	supposition mining	polarity of each tweet is calculated to distinguish whether a tweet is positive or negative. A sentiment polarity is the emotions of the user such as anger, sadness, and joy
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3. Proposed system



In this proposed system of the text based emotion classifier app, I am going to built a web based gui with the help of python framework called streamlit.

Streamlit is used to build machine learning models directly on the web and also helps us to share our project. It has various data visualization tool which is integrated right in the framework itself.

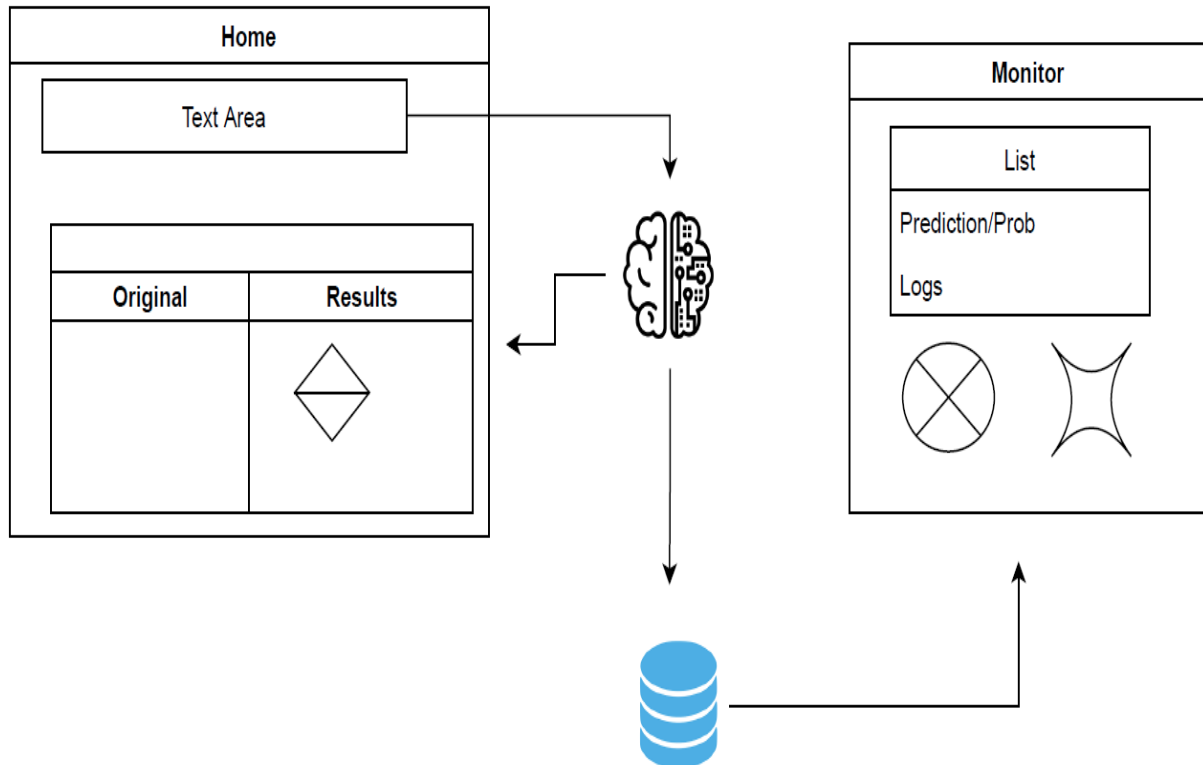
However, we will be using streamlit to see the graphs generated by our classifier model.

The dataset which is used to train the model is emotion_dataset_2 from kaggle of 5.2MB

According to the values present in this dataset, our model will analyse the text entered by the user and will predict the emotion with a certain

confidence level.

4. System Architecture



5. Project Modules

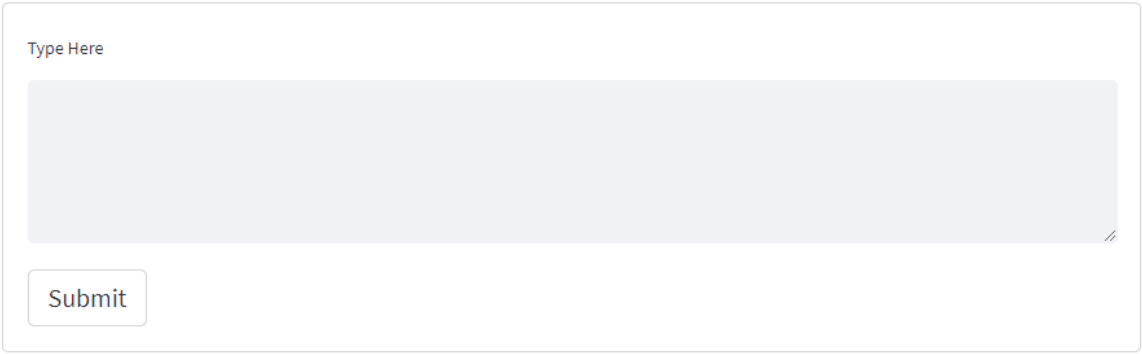
1. Python - Python is a high-level, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation.
2. Streamlit - **Streamlit** is an open-source app framework for Machine Learning and Data Science teams. Create beautiful web apps in minutes.
3. Sklearn - Simple and efficient tools for predictive data analysis · Accessible to everybody, and reusable in various contexts · Built on NumPy, SciPy, and matplotlib
4. Nltk - The Natural Language Toolkit, or more commonly NLTK, is a suite of libraries and programs for symbolic and statistical natural language processing for English written in the Python programming language.
5. Matplotlib - Matplotlib is a plotting library for the Python programming language and its numerical mathematics extension NumPy.
6. Numpy - NumPy is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.

6. Implementation

Screenshots

Emotion Classifier App

Home-Emotion In Text



The screenshot displays a web interface for an emotion classifier. It features a light gray rectangular container. Inside the container, at the top left, is the placeholder text "Type Here". Below this text is a large, light blue rectangular text input area. At the bottom left of the container, there is a white rectangular button with the word "Submit" in black text. A small double-slash icon is visible at the bottom right corner of the text input area.

Fig 4 : Homepage

Home-Emotion In Text

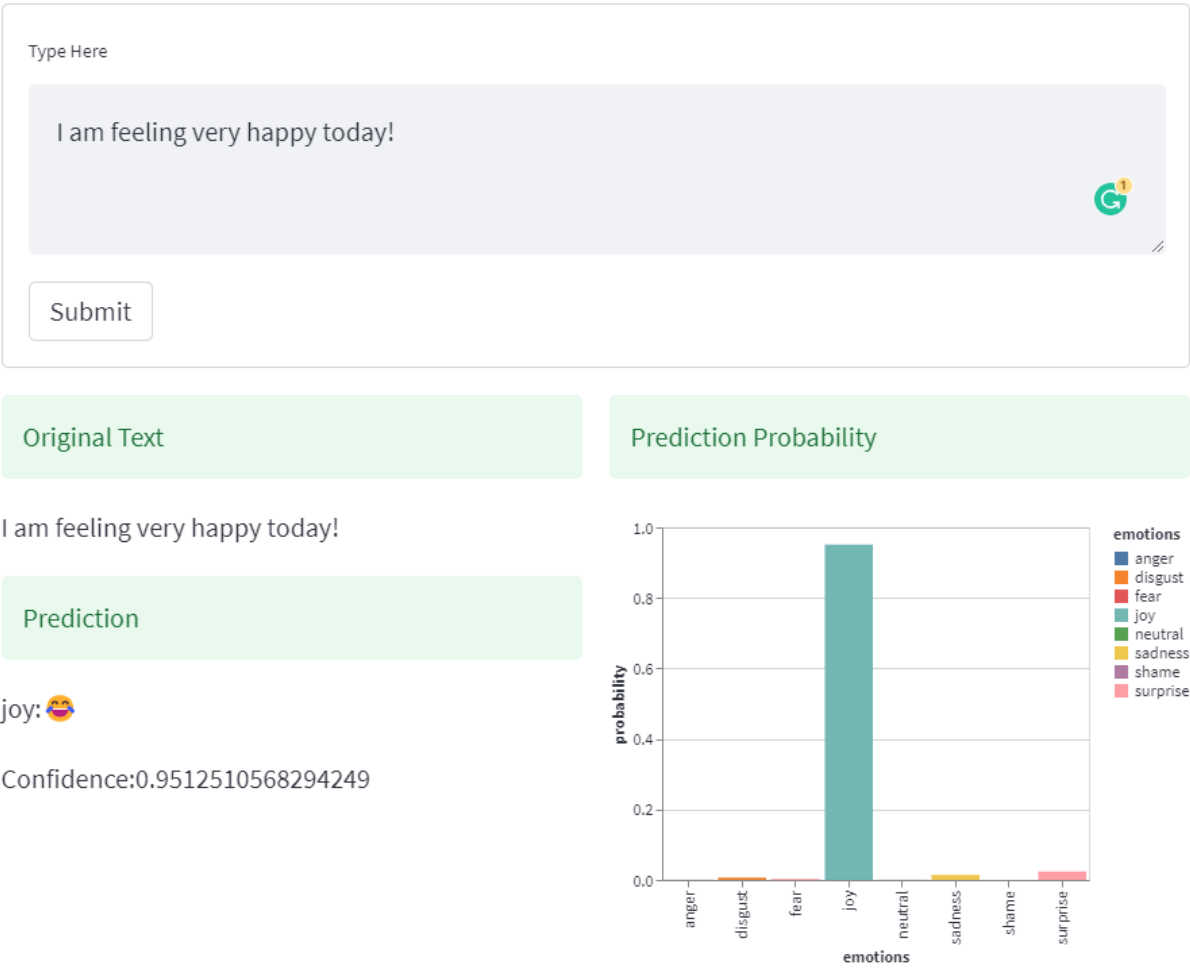


Fig 5 : Positive result

Emotion Classifier App

Home-Emotion In Text

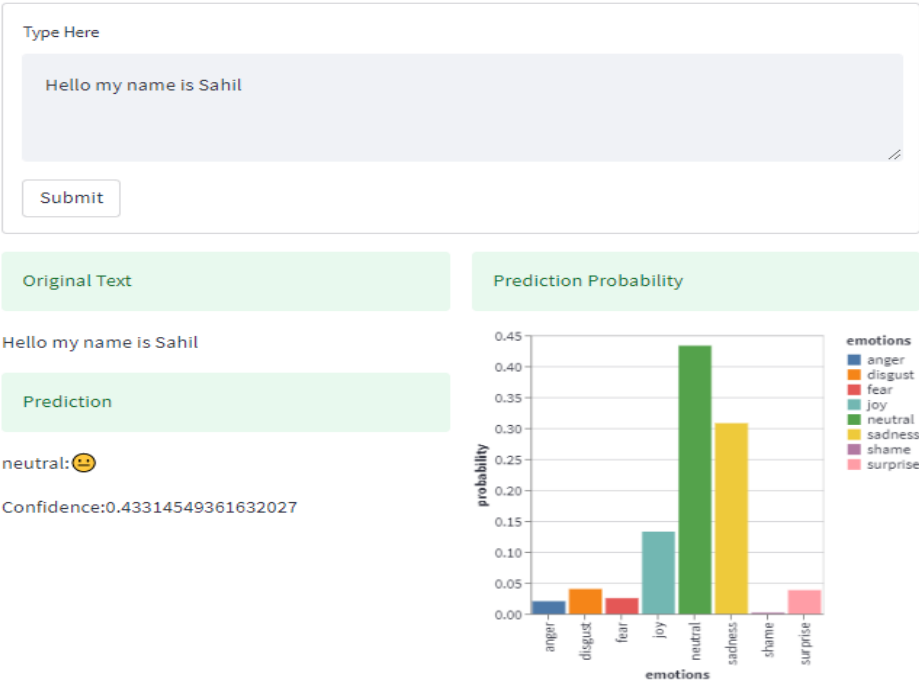


Fig 6 : Neutral Result

Home-Emotion In Text

Type Here

I am feeling very sad today!

Submit

Original Text

I am feeling very sad today!

Prediction

sadness: 😞

Confidence:0.8069047015782015

Prediction Probability

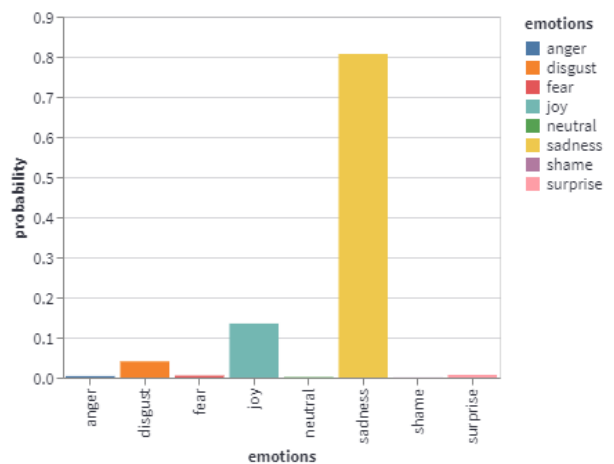


Fig 7 : Negative Result

Page Metrics



	Pagename	Time_of_Visit
0	Home	2023-04-16 08:49:32.096299
1	Monitor	2023-04-16 08:49:37.889341
2	Home	2023-04-16 08:50:03.721378
3	Home	2023-04-16 08:50:15.106743
4	Home	2023-04-16 08:50:22.840085
5	Home	2023-04-16 08:50:38.926521
6	Home	2023-04-16 08:51:20.689183
7	Home	2023-04-16 08:51:36.546866
8	Home	2023-04-16 08:51:49.537238
9	Home	2023-04-16 13:56:15.081273

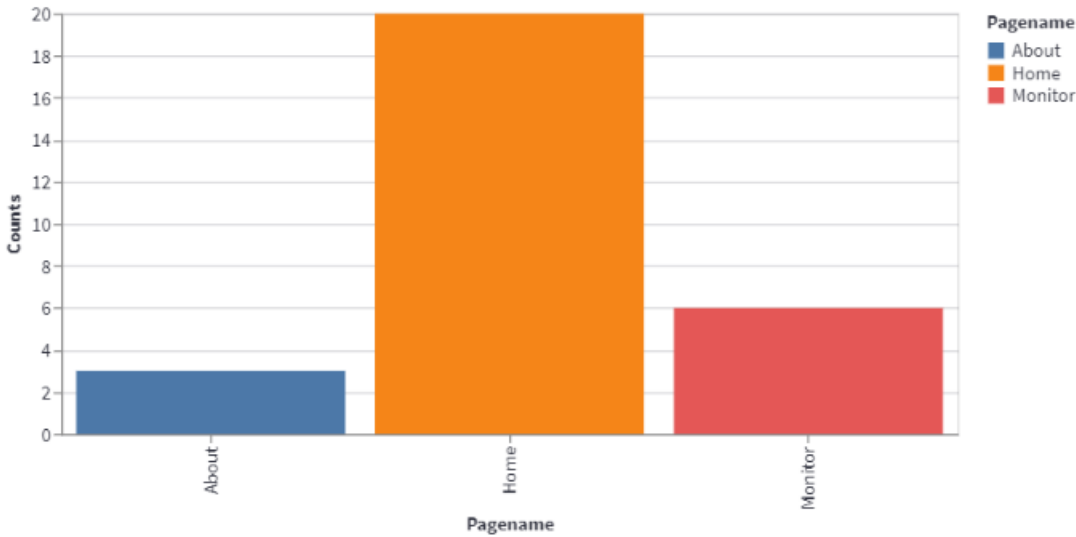


Fig 8 : Page Metrics

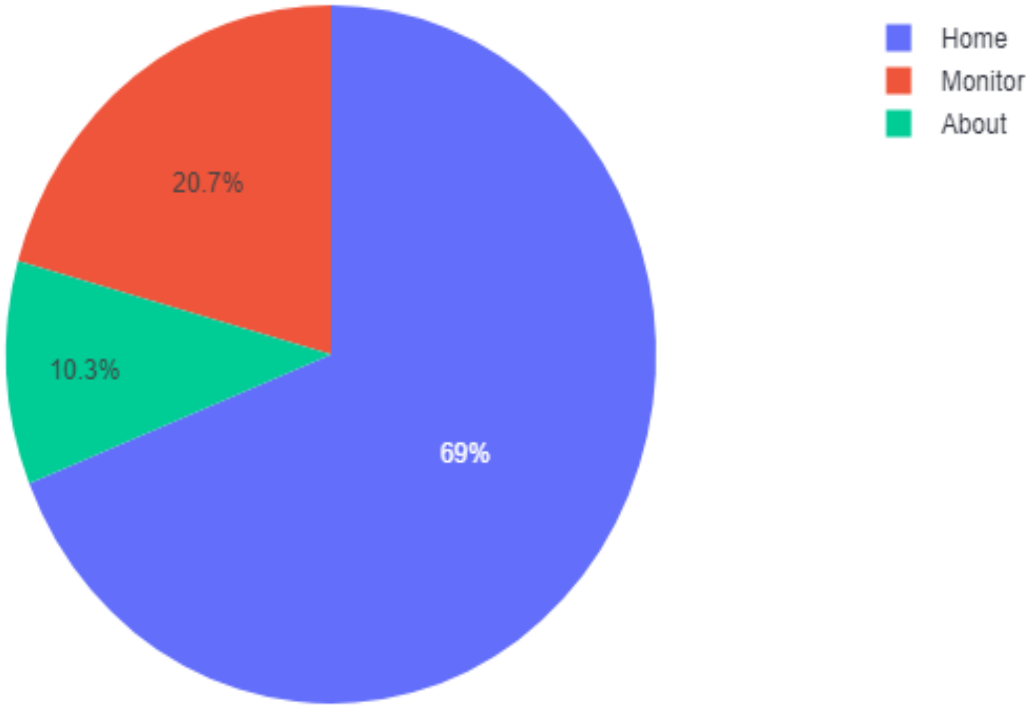


Fig 9 : Pie Chart

Emotion Classifier Metrics

	Rawtext	Prediction	Probability	Time_of_Visit
1	I AM SICK	joy	0.3131	2023-04-16 08:50:22.857075
2	i am sick	joy	0.3131	2023-04-16 08:50:38.944941
3	I am very happy	joy	0.9009	2023-04-16 08:51:20.724762
4	I am very Engry	joy	0.5357	2023-04-16 08:51:36.562730
5	I am very angry	anger	0.6637	2023-04-16 08:51:49.553132
6	we are all not at same point	surprise	0.5812	2023-04-16 13:56:56.760445
7	hello are we surprised you ?	surprise	0.5126	2023-04-16 13:57:30.693493
8	i am fine	neutral	0.5528	2023-04-16 13:57:45.970046
9	i am angry	anger	0.7385	2023-04-17 04:57:35.883696
10	we are glad to see you	surprise	0.7094	2023-04-17 05:03:34.085048

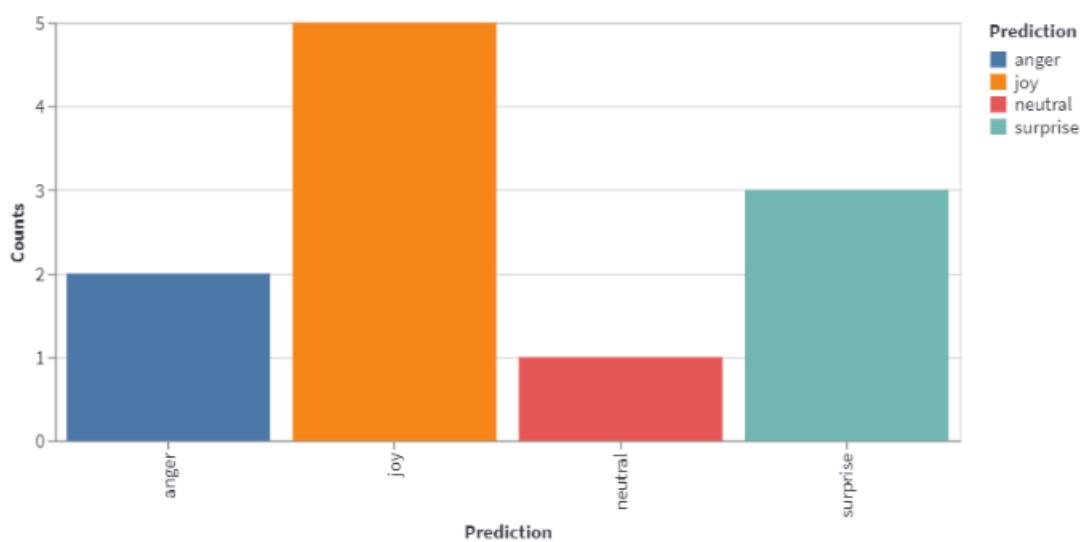


Fig 10 : Emotion Classifier Metrics

7. Conclusion

There are many benefits of Adopting a Sentiment Analysis Tool

If your company provides an omni-channel experience, a sentiment analysis tool can save your team valuable time organizing and reporting customer feedback.

Rather than going through each tweet and comment one-by-one, a sentiment analysis tool processes your feedback and automatically interprets whether it's positive, negative, or neutral. Then, it compounds your data and displays it in charts or graphs that clearly outline trends in your customer feedback. This not only gives your team accurate information to work with, but frees up time for your employees to work on other tasks in their day-to-day workflow.

Now that you know what a sentiment analysis tool is and how it can benefit your business, let's take a look at some of the best tools available for 2021.

We can use this classifier app to reduce suicide rate by knowing the emotion of the user.

Sentiment analysis is a uniquely powerful tool for businesses that are looking to measure attitudes, feelings and emotions regarding their brand. To date, the majority of sentiment analysis projects have been conducted almost exclusively by companies and brands through the use of social media data, survey responses and other hubs of user-generated content. By investigating and analyzing customer sentiments, these brands are able to get an inside look at consumer behaviors and, ultimately, better serve their audiences with the products, services and experiences they offer.

8. Future work

Now the confidence of this model is moderate.

We can improve the confidence by applying machine learning algorithms in order to train the model based on inputs provided by the user.

By recognizing the already existing data in the dataset, this emotion text classifier app can provide the results with even more accuracy.

The future of sentiment analysis is going to continue to dig deeper, far past the surface of the number of likes, comments and shares, and aim to reach, and truly understand, the significance of social media interactions and what they tell us about the consumers behind the screens. This forecast also predicts broader applications for sentiment analysis – brands will continue to leverage this tool, but so will individuals in the public eye, governments, nonprofits, education centers and many other organizations.

Algorithms have long been at the foundation of most forms of analytics, including social media and sentiment analysis. With recent years bringing big leaps in machine learning and artificial intelligence, many analytics solutions are looking to these technologies to replace algorithms. Unfortunately for organizations looking to leverage sentiment analysis to measure audience emotions, machine learning isn't yet ready to tackle the complex nuances of text and how we talk, especially on social media channels that are rife with slang, sarcasm, double meanings and misspellings. These make it difficult for artificial intelligence systems to accurately sort and classify sentiments on social media. And, with any analysis project, accuracy is crucial. It is uncertain if machine learning will progress to the point that it *is* capable of accurately analyzing text, or if sentiment analysis projects will have to find a new basis to avoid the current plateau of algorithms. Some social media analytics solutions have begun taking a more human approach to deciphering the often ambiguous nature of text, but this can be time consuming.

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