# Natural Language Processing -Assisted Detection of Stress Level Using Machine Learning Algorithm

**[1]Tamil Elakya.T, [2]Dr.K.Manikandan**

[1]Ph.D Research Scholar, [2]Associate Professor
Department of Computer Science
PSG College of Arts & Science, Coimbatore

***Abstract*- Stress is any unpleasant sensation or feeling that causes strain or pressure. It can influence the body, the psyche, and behavior. The purpose of this article is to find out if the person is stressed. In this paper, NLP has been used as a term to describe it. This helps to identify the subject that is related to the text and this model will helps to identify the emotions of the person. Stress can be analyzed using these emotions and In order to gain a more precise understanding of stress and to equip individuals with the necessary resources to improve their physical and psychological well-being, the Bernoulli Naïve Bayes algorithm is employed in this article.**

***Keywords*: NLP, Reddit dataset, Stress, Machine Learning Algorithm.**

## I.INTRODUCTION

Stress is commodity that affects numerous people each and every day. Stress can also be literally dangerous, similar as memory problems, moodiness, pangs and pains. Feeling hovered or upset can result in stress, which is a normal physical response.it can affect the mind, a body and behavior. The surprising result is that around 24 percent of Indians are struggling with stress of various kinds. Generally stress is divided into 3 types.Acute stress is the most common form of stress and is usually caused by imagining or thinking about past events or future needs.Episodic acute stress-The occurrence of episodic acute stress arises when an individual is often subjected to short bursts of acute stress.Chronic stress – This sort of stress happens when a person feels trapped in a negative situation. We utilize a NLP technique to assess user stress based on the previously defined stress.

NLP (Natural Language Processing) is a field of study that combines computer science, linguistics and machine learning to investigate the communication between computers and humans in natural languages. NLP which includes 2 components.NLU (Natural Language Understanding)-By eliminating the core parts of speech, it helps computers to understand and interpret human language.NLG (Natural Language Generation)- It's a kind of natural language process that produces meaningful words and sentences from some internal representation.

## II. MATERIALS AND METHODS

### 2.1 Data Source:

Data from Reddit dedicated to mental health are included in this dataset. This dataset includes a variety of mental health issues that people share about their lives. The data contain a total of 2839 samples with 115 attributes. If 0 does not indicate stress and 1 indicates stress, this dataset is labelled as 0 and 1.

### 2.2 Removal of stop words:

This step is to clean up the data by importing regular expressions in order to extract the base form of words.


**Fig-2.1**

### 2.3 Usage of word cloud:

To represent text data, word cloud is a data visualization technique that displays the size of each word, indicating its frequency. It helps to highlight the importance of textual data points using a word cloud. To analyse the data word cloud are used to convert it into a Binary format.

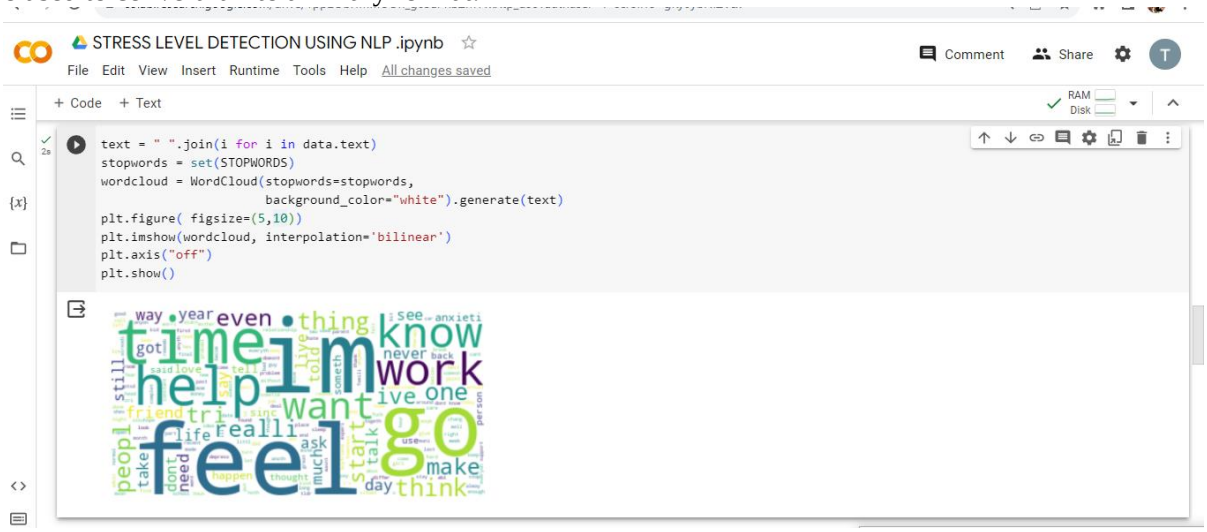


**Fig-2.2**

### 2.4 Usage of Count vectorizer:

Count vectorizer converted a collection of text documents to a vector of term and token counts. Prior to creating vector representations, this allows text data to be processed before being generated. This functionality allows the Text feature representation module to be extremely flexible.


**Fig 2.3**

### 2.5 Model creation:

The data are followed by training and testing, using an algorithm of Bernoulli Naive Bayes which forms part of the Naive Bayes family to identify whether or not a person is under stress or not , on the basis of data.


**Fig 2.4**

## III.RESULT AND CONCLUSION

Through social media posts gathered through Reddit and using Natural Language Processing and machine learning algorithms, this research provides a model for stress detection on people with the goal of preventing health issues related to stress**.** A lot of basic cleaning and pre-processing has been done, such as removing stop words, URLs, special characters, etc. A Bernoulli Naive Bayes algorithm is used in this project. By using text to enter our emotions, the model can determine whether a person is under stress.

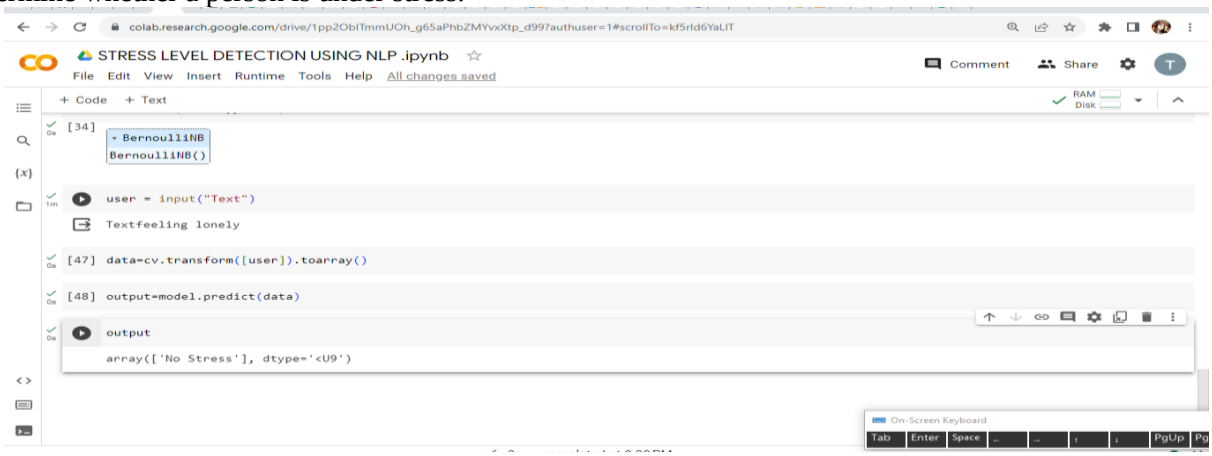


**Fig 3.1**

## IV.FUTURE WORK

This work has been based on a small amount of data, but it can be extended to a larger volume for a better understanding of stress. The work can also be explored using different types of machine learning algorithms to predict results with different types of multimedia data.

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