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ML and AI Based Counseling Chatbot Application: Cafe Buddy

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Abstract: ***As the covid outbreak sweeps across the world, the world saw their worst fear and rapid rate of increase in some unwanted medical conditions. No one is left behind by its effect, whether mentally, physically, or economically. People see a surge increase in mental health conditions among youth particularly. Since 2020 we have seen a rapid increase in suicide cases not only among ordinary people but also in every class of people. This clears the thought that only the underprivileged suffer. According to a survey conducted in the U.S., it has been seen a rapid increase in depressive disorder. Depression is the leading cause of disability worldwide. Around 75% of people with mental problems in developing nations go untreated, and nearly 1 million people commit suicide each year. Early identity of melancholy can assist to deal with the intellectual ailment and offer help to those who are affected. Detecting despair in advance may be a big step to dealing with the intellectual contamination and providing help to the human beings tormented by this horrible intellectual contamination. This depression can be effects detected inside the primary levels using the pattern searching for queries. Text assessment, owner assessment (behavior patterns like searches-per-day), temporal assessment (time of day even as people search), and seen assessment of snapshots searched could be the parameters of detecting depression.***

Keywords: AI, Chat-bot, Extensions, Mental-Health, Counseling.

I. INTRODUCTION

Mental health can be defined as behavioral, psychological, and social well-being. It is the reflection of our thoughts, emotions, and actions. Mental fitness is vital at each level of life, from formative years and youth to adulthood. In a survey by India Inc "1 out of 5 Indians will suffer from depression in their lifetime". In a report given by W.H.O, India was found to be the most depressed country of the world. Depression is one of the most left out troubles of the contemporary time, even though every exceptional day the newspaper consists of in it a few records of despair associated issues and it is visible anywhere that despair is at its peak. What makes it even worse is that the way we talk about mental health is broken. Sometimes people are not able to recognize their mental conditions while some find themselves incapable of sharing their emotions with others. Such people need someone to share their thoughts and emotions. With the help of emerging technologies like AI, and ML we serve an online platform that can detect the stage of depression, in addition to which also can assist to alleviate depression and tension in a person. Thus, in today's scenario, our platform can be an area of great interest. "The science and engineering of making intelligent machines, especially intelligent computer programs". -John McCarthy. The basic tools required for the application are ML algorithms and AI models that can detect and predict depression levels. The browsing of the user is monitored and retrieves data based on the search result of the person. For this reason, we're running with the browser records of the user. The NLP algorithm is being used for textual data scraping and processing. The User Interface (UI) is a simple chrome extension i.e. web-based UI. When the extension is enabled, it offers the despair stages of the man or woman surfing on a scale of 1 to 10. A score of 1 might suggest excessive stages of despair, at the same time as a score of 10 will suggest low stages of despair. This add-on moreover shows measures and cures to cope with despair. For example, despair relieving music, an appointment with a health practitioner or psychiatrist, etc.

II. LITERATURE REVIEW

Being aware of your standard fitness is crucial so you can discover any signs and are seeking expert assistance whilst necessary. The overall health of a person is determined by both the physical and mental state of that person. Mental fitness may be described as emotional, behavioral, and mental well-being. It is simply the reflection of your thoughts, emotions, and actions. Mental fitness cognizance is something that could assist the hundreds of thousands of folks who are impacted by intellectual fitness troubles around the world. In recent years, there has been increasing acknowledgment of the important role mental health plays in achieving global development goals, as illustrated by the inclusion of mental health in the Sustainable Development Goals.

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According to NIMH(National Institute of Mental Health), depression is a serious mood disorder that affects how you think, feel and act. According to the National Mental Health Survey of India 2015-2016, the Media referred to the findings of the report as follows: "India needs to talk about mental illness;", "Every sixth Indian need mental health help;". "8% of people in Karnataka have a mental illness;". "Mental problems more in the 30–49 age group or over 60; low income linked to the occurrence of mental disorders;" and "urban areas to be most affected" were some of the headlines in the mass media.

The two most common mental health conditions are-

1)Anxiety Disorders: More than 18% of adults every yr conflict with a few sort of tension diseases, such as post-demanding pressure disease (PTSD), obsessive-compulsive disease (OCD), panic disease (panic attacks), generalized tension disease, and precise phobias.

2)Mood Disorders: Mood disorders, together with despair and bipolar despair, have an effect on almost 10% of adults every year and are characterized by problems in regulating one's temper.

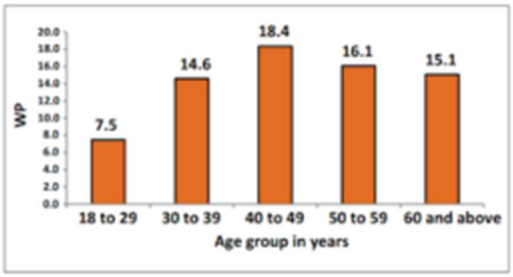


Fig.1 Prevalence of mental morbidity in different age groups

From the above research, we have come to the conclusion of making an online chatbot for detecting the proximity of depression which can help to improve the overall mental health.

III. METHODOLOGY

A. Working Flowchart

The flow chart shown below depicts the entire functioning of the online counseling chatbot application. This flowchart depicts the extension-based (Web-based) working.

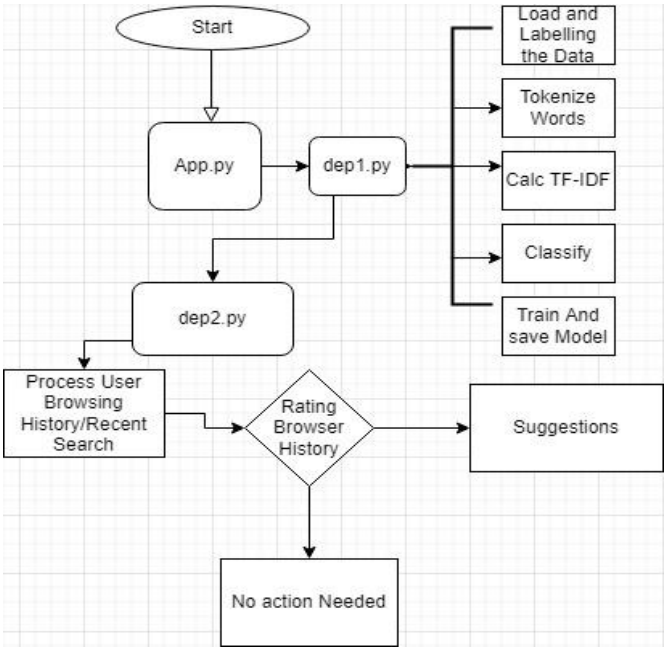


Figure.2 Flow chart of the online counseling chatbot.

B. Tools/Library Used

1) *NLP (Natural Language Processing):* NLP is used for processing the text and provides tokenized sentences or words for the classification of the sentence. The tool used is NLTK(Natural Language Toolkit).
2) *Numpy:* It is used to perform a wide variety of mathematical operations and it supplies an enormous library of High-Level mathematical functions.
3) *Pandas:* It is used for the processing of the data set. It allows the analysis of big data and makes conclusions based on statistical theories. It is majorly used for Data Science.
4) *Pickle:* It transforms a complex object into a byte stream and does the vice-versa as well.
5) *Browser History:* It is a simple python module that extracts browser history from the user's local computer and writes data to CSV files.
6) *Flask:* It is a web framework written in python that helps to develop web applications easily. It helps to keep the design of the application simple and scalable.

C. System Architecture & Working

The dataset contains nearly 10000+ data with labels of 0 and 1. 1 indicates despair thought, and 0 indicates joy. Each sentiment is being analyzed using Natural Language Processing(NLP) in dep1.py. During Processing, tokenizing of words, removing stopwords, and stemming is done. After processing the dataset an ML algorithm is used which calculates the TF-IDF(Term Frequency-Inverse Document Frequency) and also trains the model

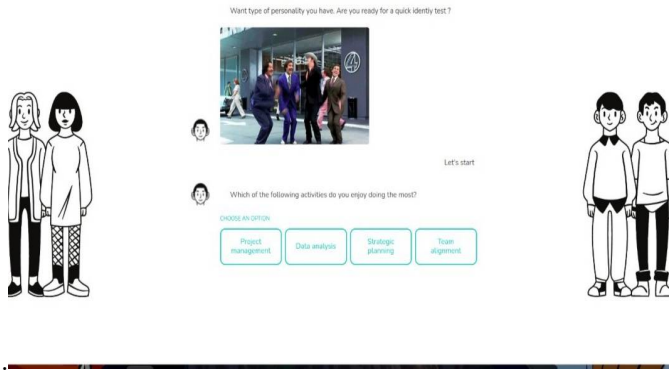


Fig. 3

The model built in dep1.py is being used in dep2.py for real-world execution. The input here is in dep2.py is the browser search history of the user.

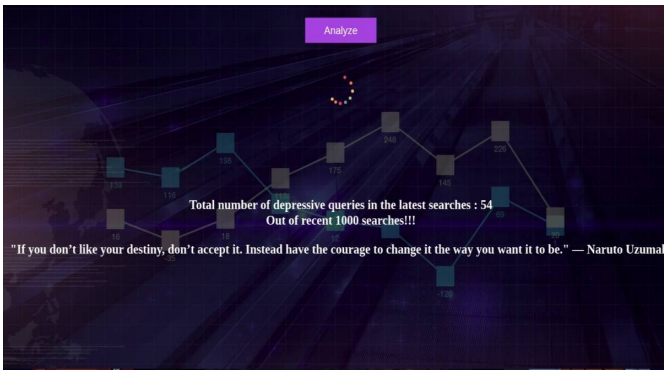


Fig.4

Based on the search history it gives a rating of mental health level. 1 indicates worst and the rating of 10 indicates best.
All these are merged in App.py for implementation.

D. Software used

1) *Python:* It is an interpreting programming language, which was first used in the early 1990s. The principal usage nowadays of python is AI engineering, Data Analysis because of its vast library which helps in the field.
2) *Jupyter Notebook:* The principal use of the Jupyter Notebook is for Exploratory Data Analysis. Also, it helps with a couple of programming languages.
3) *VS-Code IDE:* It is an integrated development environment that is used to combine common developer tools into GUI(Graphical User Interface).

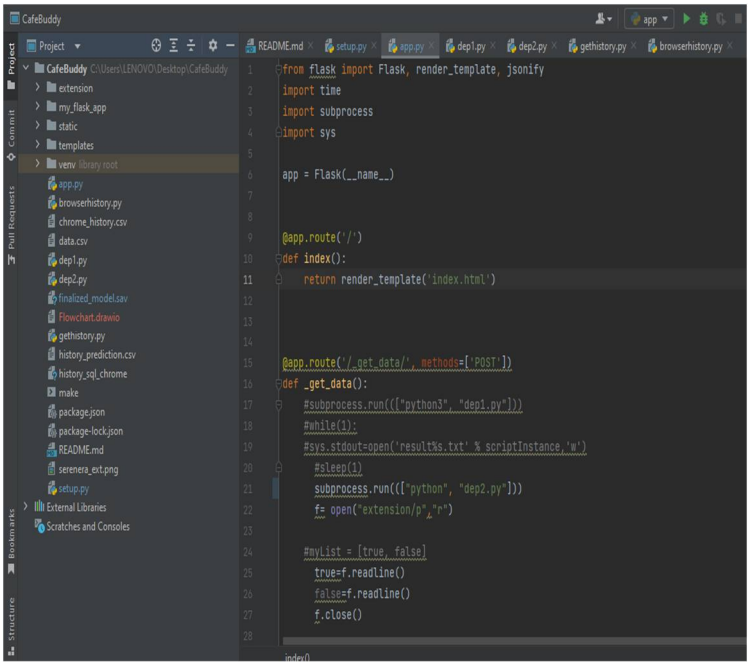


Fig. 5 Screenshot of the code implemented

IV. RESULT

This model monitors chrome browsing to detect levels of depression. A common individual performs 3-4 searches on the search engine every day. Web browsing of the individual is monitored. Web surfing of the person is monitored. It retrieves facts primarily based totally on search-engine seek outcomes of the person. The textual facts retrieved from the web browser are analyzed with the use of NLP algorithms, and predictions are made at the same.

The client end interface is a web browser extension, i.e. browser-based UI. When the extension is enabled, it gives the depression level of the person browsing on a scale of 1 to 10. A rating of 1 would indicate high levels of depression, while a rating of 10 would indicate low levels of depression. This add-on additionally suggests measures and therapies deal with depression. For example, depression relieving music, an appointment with a doctor or psychiatrist, etc.

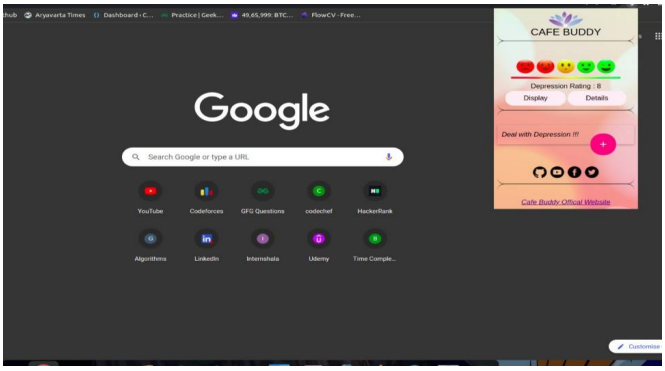


Fig. 6 Showing Depression rate

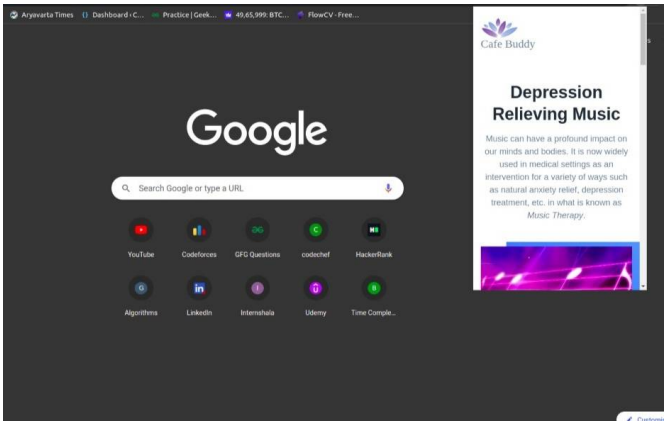


Fig. 7 Depression relieving music suggestion

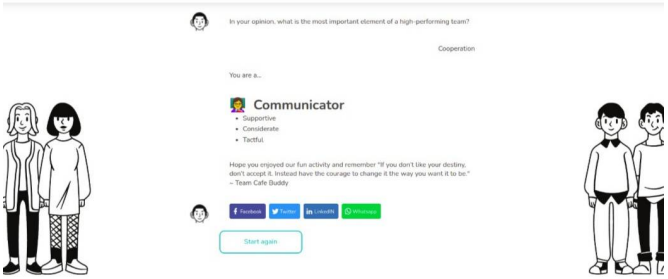


Fig. 8

V. FUTURE SCOPE

1) Integrating this chatbot with an Augmented Reality Model.
2) Adding Voice-Based (assistant) analysis.
3) Adding more depth to the rule-based chatbot
4) Adding Image processing to go for Real-Time emotion Detection using facial expression.

VI. CONCLUSION

Lack of Counseling platforms has always been a problem and with no serious steps being taken in this direction the problem has seen an exponential rise in the due course of time. We understand that our application can in no way replace the actual counselors, at least not in the current stage, but that was not our main goal. Our current goal was to make people understand the importance of counseling, aware them of its role in shaping up a better future, make them comfortable discussing their problems with a counselor, and provide instant help at times when they don't want to see a counselor considering that their problem is very little, the price charged by a counselor is comparatively much high or there is no counselor available.

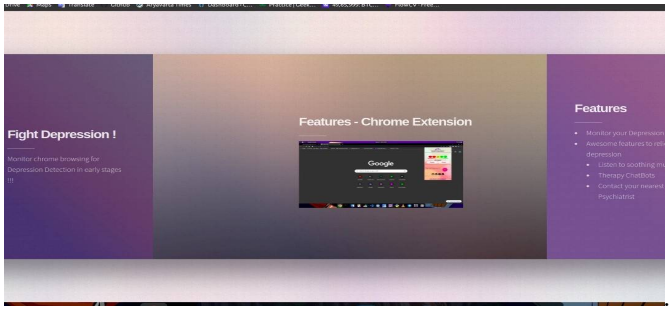


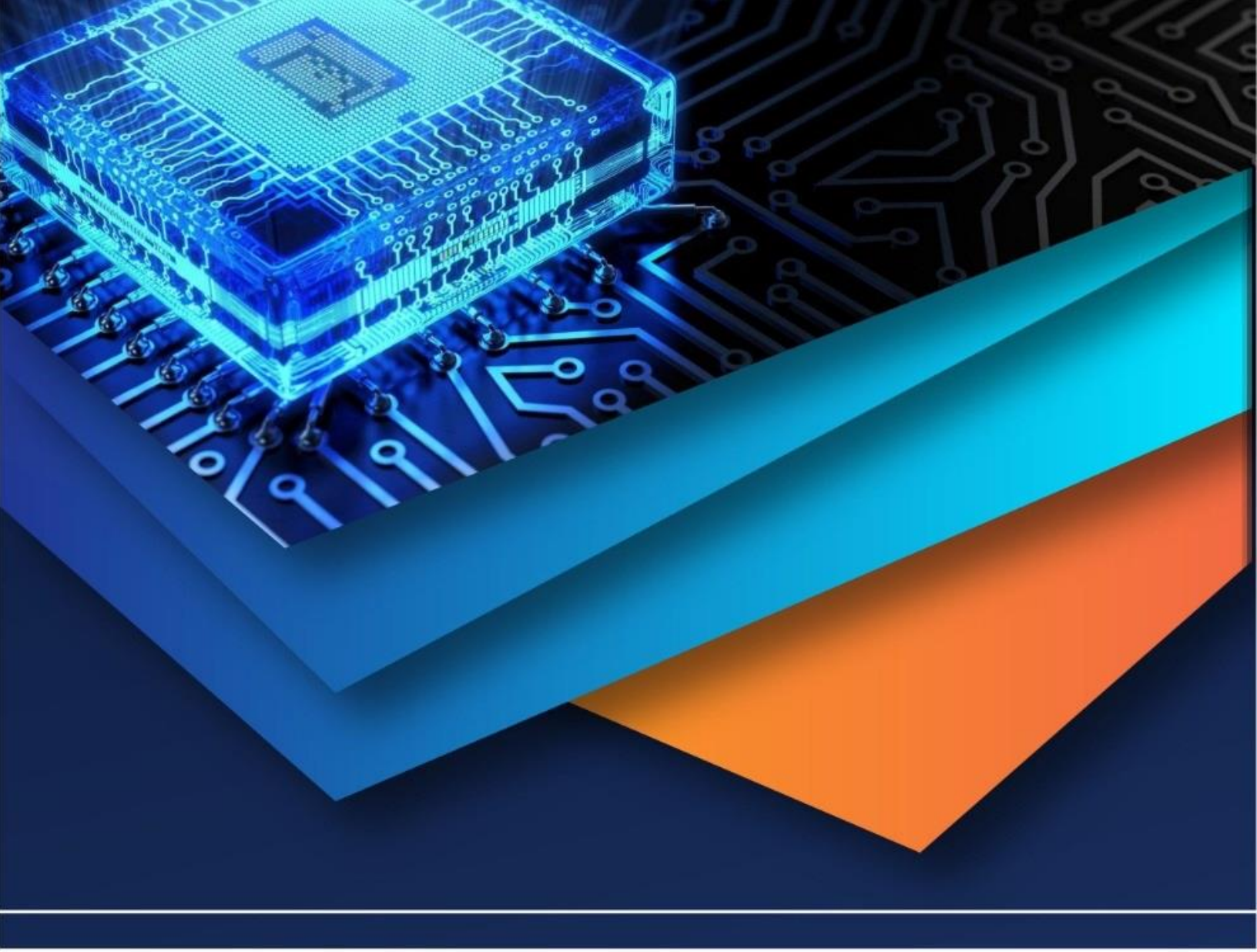
Fig. 9 User Interface of the Chatbot

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