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Overcoming Everyday Hurdles with Mental Health Tracking App

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Abstract: In particular, depression is the third leading cause of disease in the world and will be the leading cause of morbidity in 2030. Depression is the leading cause of years lost to disability worldwide. Mental health problems, including alcoholism, are the top ten causes of disability in developed and developing countries. Millions of people worldwide have a mental health condition and one in four people worldwide will experience a mental health condition in their lifetime.

Nearly a million people die by suicide each year, making it the third leading cause of death among young people. Thus, to cope up with such extremities a suitable guidance system is needed to remedy this issue and bring about some sense and calm among humanity. This mental health app developed using Flutter allows users to talk to a chatbot. Users can either communicate using chat or speak directly using the speech-to-text function. Using the ChatGPT API connection, we can then gauge the emotions of the users and provides them with any required help.

The main objective of the project is to include the basic aid of a mental issue in a mobile application that can be operated at the user's fingertips.

Keywords: Mental Health, Anxiety, Emotional Well-Being, Stress, Insomnia, Machine Learning Algorithms.

I. INTRODUCTION

The global mental health software market is expected to reach $17.5 billion by 2030. It is expected to expand at a CAGR of 16.5 per cent from 2022 to 2030. Interventions and adoption of mental health programs due to their benefits in improving mental health. Increasing patient awareness and/or consumer wellness and mental health is one of the key factors driving the growth of this market. The depression and anxiety management app segment will account for more than 25.0% in 2021, due to the prevalence of depression and anxiety disorders and increasing awareness of apps to treat these conditions. For example, Flow, an app that helps in managing depression, saw a 247% increase in sales of brain stimulation headphones at home. The headset works in conjunction with the Flow app to treat depression. In addition, according to a report published by Med-Tech Innovation, during the COVID-19 pandemic, the Flow application and almost 30% of headphone users have overcome depression with the help of this application. Such a situation means that the market is driven by growth.

Positive mental health allows people to reach their full potential, deal with life's stressors in a healthy way, increase productivity at work, give back to their communities and carry out commitments. People struggling with mental health issues can often seek help from others. However, for fear of being judged, they often deal with their problems and deny that their mental health is bad. The mission is to build psychologically sound followers.

You will try to discover approximately the psychological condition of your client, see whether they are enduring certain displeasures and later suggest measures they can take away to get from their modern situation. Furthermore, this will help in maintaining the mental health of our users by tracking their emotional patterns. Our application also provides users with the option of connecting to a mental health expert or a professional therapist. This helps the user to get in touch with somebody in case they feel they require professional help.

Moreover, our Mental Health Tracker also provides users with a list of activities to enhance their mental well-being. This can include activities such as yoga, meditation, and physical exercise. All these activities are designed to help the users relax and regain their balance emotionally. We believe that with this application, we can provide our users with the necessary assistance and support they require to stay mentally healthy.

II. MAPPING DATASET

Suffice it to say mental health problems are widespread but help is available. Individuals with mental health problems can get appropriate measures to recover completely. Mental peace should be the utmost priority in living a harmonious life. Kaggle's search engine allows users to specific categories to ensure the datasets they find will fit their bill.

Fig -2.1: Dataset Overview

III.   RELATED WORKS

There are several papers essentially focused on the impact of covid pandemic on people's psychological as well as emotional health that catered to severe mental jeopardies such as depression, anxiety, bipolar disorders and many other life-harming scenarios. The team focused on a system design that was capable enough to extract the current sentiments of the user and entailed accurate results along with necessary tasks to resolve those issues they are facing.

The incorporation of mental health support into mobile applications has gained significant attention in recent years. The main objective of this project is to develop a user-friendly mobile application that provides basic assistance for mental health issues, accessible at the user's fingertips. To achieve this, the application aims to minimize stress on the user's mind while addressing their mental health concerns.

1) Overall, the literature highlights the significance of user-friendly design, mental health assessment, and evidence-based interventions in mobile applications for mental health support. By aligning with these principles, the envisioned application aims to address the user's mental health concerns through accessible and effective means [1].

2) The article suggested that a person's mental nicely-wholeness is his or her intellectual condition, in addition to an overview of his or her fashionable surroundings. Mind chemistry abnormalities are the purpose of mental infection. An individual's intellectual health serves as a barometer for correctly addressing his or her illnesses [7].

3) Anxiety issues can be prevented or managed extra efficaciously with guidance. If atypical mental states are discovered early in the disease's origination, greater remedy and care can be provided. So judging human beings' mental states based on their looks or conduct is a complex mental technology that has but to be mechanized [2].

Also, the mental health and well-being of university students have gained significant attention in recent years due to the unique challenges they face during their transition into higher education. This related works section provides an overview of the existing literature in this field and highlights the need for further research and support for university students' mental health.

a) This study aims to contribute to the understanding of mental health in university students by providing a bird's eye view of the research conducted in this field in recent decades using a bibliometric approach.

b) By employing bibliometric indicators, such as publication and citation trends, key contributors and venues, patterns of collaboration, and recurring research themes, this study seeks to identify the evolution, gaps, and opportunities in the field. Understanding the landscape of mental health and well-being research among university students can guide future research, inform policy development, and enhance support services to meet the needs of this population [8].

The purpose of this research paper is to help people understand their problems and allow doctors to understand the mental health of their patients. All this is only possible when we use the most accurate models possible.

IV. DESIGN

The system being a multi-stage process derives the final value with accurate predictions based on these predefined stages. Accumulation and gathering of data, data pre-processing, data encoding, and training the algorithm are some of the key phases. After achieving the desired accuracy, it is integrated with the application for real-time purposes.
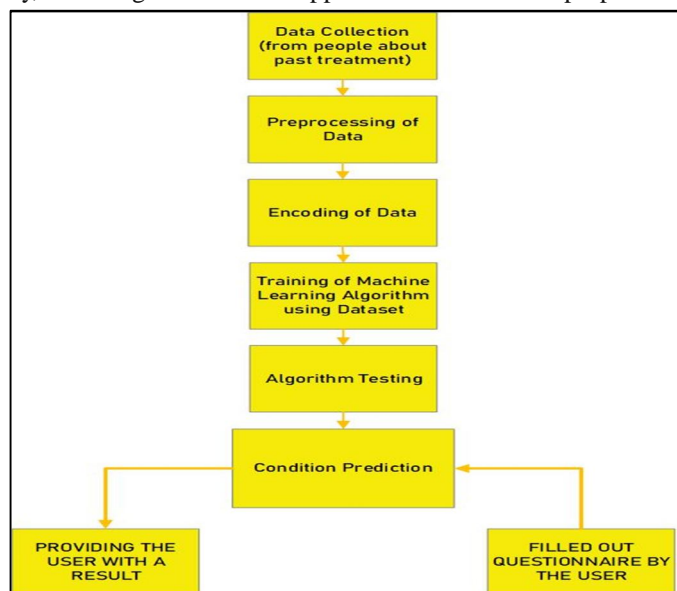

Fig -4.1: Block Diagram

V. MACHINE LEARNING TOOLS AND ALGORITHMS:

A machine learning algorithm needs to use certain values to demonstrate its effectiveness. Each project should have a different model depending on the data type and task completion. Therefore, it is important to correct the inconsistency of the model to improve its effectiveness and accuracy. We try to ensure that adequate value is given to each model in our work and we give our models the highest priority. Mentioned below is the best possible approach and algorithm that could give us the most accuracy.

1) *Ensemble Learning:* Ensemble learning helps improve the results of machine learning by combining multiple models. This approach can give better predictions than a single model. The main idea is to review the criteria individually (experts) and let them vote. The idea behind ensemble learning is to use the capabilities of multiple models to reduce error or bias in a model and ultimately lead to more accurate predictions.

2) *Bagging:* Bagging, also known as bootstrap aggregation, is a learning technique that helps improve the efficiency and accuracy of machine learning algorithms. It is used to control the bias-variance trade-off and reduce the variance of the prediction model. The bag does not overfit the data and is used in regression and classification models, especially decision tree algorithms.
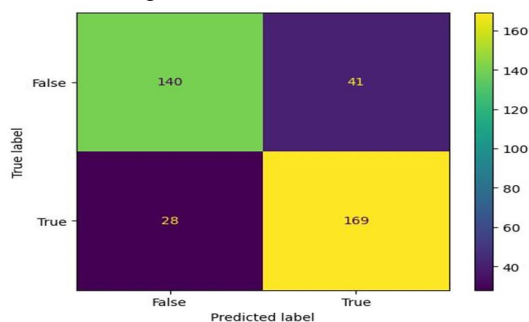

Fig -5.1: Confusion Matrix for Model

3) *Reinforcement Learning:* Reinforcement learning (RL) is an area of machine learning concerned with how intelligent agents ought to take action in an environment to maximize the notion of cumulative reward. The chatbot of this application is based on an API reference call to Open AI's 'ChatGPT' implementation.

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VI. PROPOSED MENTAL HEALTH APPLICATION:

The development process was made to evolve the mental fitness application because it supports user interface design and explores a specific set of software components. The application comprises a wellness homepage that transcends into various components such as a chatbot for an alternate communication channel, a curriculum on how to remedy mental tension and exercises for effective stimulation of mood. A selective section module for information on some of the most common mental health problems is also laid out on the main interface for a casual read for end users.
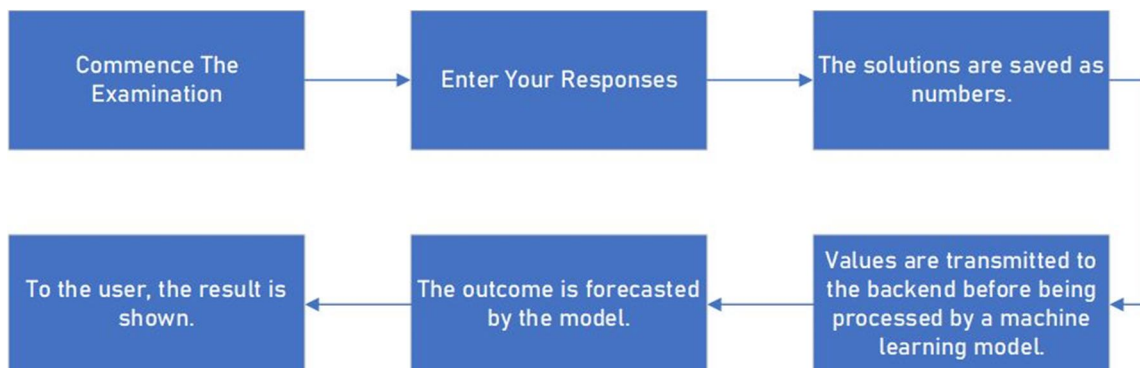

Fig -6.1: Data Flow Diagram

VII. RESULT

The said algorithm shows an efficacy of over 80% on functioning as shown by the ROC curve mentioned below. We also experimented with finetuning the hyperparameters to see if the accuracy could be further improved.
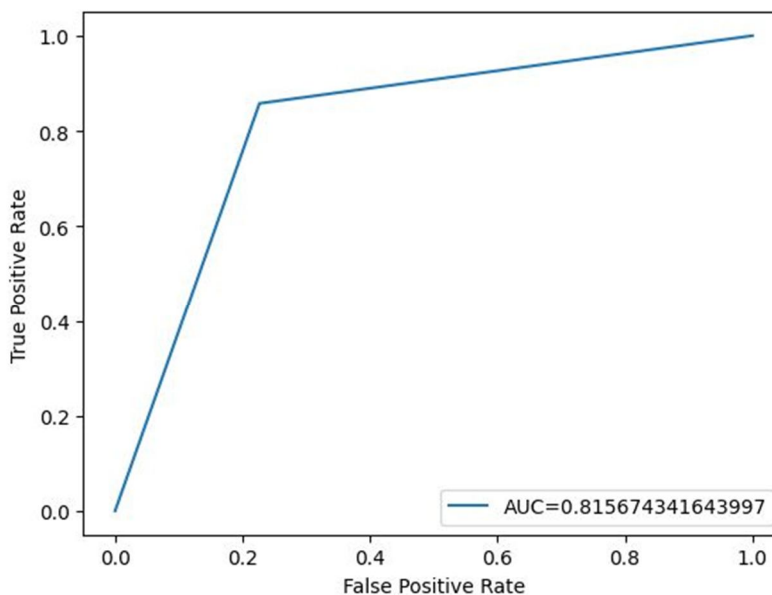

Fig -7.1: ROC Curve

VIII. CONCLUSION

We're overcoming the downside of the current system, and providing a smart application that will no longer just simply screen a person's mental health with protection but additionally display advice on every occasion necessary. The assignment centres around building an emotional wellness tracker. You may attempt to find out about the psychological condition of your customer, see whether they are suffering during that instance of time and later on propose measures they could take away to get from their circumstance. A customer responds to certain inquiries and because of the ideal responses that they give, you will advocate errands to them and hold a document of their psychological mindset for displaying on a dashboard.

IX. LIMITATION OF THE RESEARCH:

The setbacks corroborating the research would be high market competition and the strategic importance of uniqueness and reactiveness among numerous different applications currently entailing the marketplace. The funds required to successfully deploy and establish the networking of the application are substantial. The researchers believe that although the numbers aren't significant, this study still highlights the importance of the underlying problem and provides a feasible solution that would be assessed further in future studies

X. ACKNOWLEDGEMENTS

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