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Student Mental Health Portal Based On DAS Score Using Machine Learning

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Abstract: DASS-Monk is a solution for educational well-being. It provides an easy-to-use platform for students to evaluate and take care of their emotional health, stress, and anxiety. The programme offers tailored suggestions, such as relaxing music, motivational TED presentations, and focused workouts. Teachers can identify and assist kids who are in need by using a dashboard. By providing a helpful learning environment and combining technology and compassion, DASS-Monk makes the way to well-being simpler.
Keywords: Machine Learning, K-means clustering, Fuzzy clustering, DBScan clustering

I. INTRODUCTION

Our project is at the forefront of education and student welfare. We are developing an easy-to-use platform that will allow students to evaluate their stress, anxiety, and depression levels. After finishing, clients receive tailored advice, which could range from soothing music to useful activities. The technology helps teachers by quickly identifying pupils who want immediate assistance. Our initiative seeks to make it easier for students to comprehend and take care of their mental health by combining technology and mental health resources. In addition, it gives schools a useful resource that helps them foster a more resilient and healthy student body.

Improving the lives of kids is our main goal. We are developing an easy-to-use website that will allow students to report their emotional state, such as being stressed, anxious, or depressed. Our system can promptly notify teachers when a student requires assistance. The goal is to create a bridge between technology and mental health to help students manage and to enable schools to intervene when necessary.

Our driving force is simple: the welfare of the students. The fast-paced educational environment of today is contributing to an increase in stress and mental health issues. We think there is a workable way to support teachers and students. By providing an easy-to-use platform for self-evaluation and tailored assistance, we are proactively addressing mental health. Our effort seeks to lessen the stigma associated with these problems and give immediate support to those who are most in need of it.

Our motivation stems from the desire to establish a more wholesome and encouraging learning environment where teachers can step in when needed, and students can flourish in hospitals in the event that a patient is moved or sees many hospitals. The improvement of student wellbeing at educational institutions is the main goal of the project. It entails creating a simple online tool that lets students evaluate their own stress, anxiety, and depressive states. Based on these evaluations, customised recommendations—which include workouts, TED presentations, and music—will be produced. Additionally, the project is accommodating to teachers, allowing them to use self-assessment findings to quickly identify children who want immediate attention. The project also includes providing relevant resources. The project's main goal is to provide a simple, approachable, yet technologically advanced solution. It gives kids the tools they need to take charge of their mental health and gives teachers the time they need to provide timely support when needed.

II. RELATED WORK

DASS Monk was created as a platform to assist students in evaluating their mental health and addressing related issues by providing guidance and support. Around the world, DASS Monk is being placed in numerous educational institutions because of its high-analysis features and affordable cost. But there are further challenges when it comes to transferring student data to an electronic version that can be shared. Still, there are more challenges in evaluating student data and suggesting solutions. The idea was to create a user-friendly platform that would allow students to take the DASS-21 test and receive tailored recommendations—like music and fitness regimens—based on their scores. The technology can help school personnel locate and assist pupils in need in a timely manner. to maintain the platform's accessibility and simplicity while making it user-friendly. It would create a friendly environment in schools and enhance the mental health of pupils.

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DASS Monk is a cutting-edge recommendation system powered by machine intelligence that aims to improve student wellbeing. Using the Depression, Anxiety, and Stress Scale (DASS) 21 questionnaire, DASS Monk analyses and groups students according to their mental health profiles using the DBSCAN clustering algorithm. The app offers tailored suggestions that are carefully chosen to take into account each user's unique DASS score. These suggestions include TED Talks, music playlists, motivational sayings, and relaxing methods. DASS Monk, which was created using ML and Python, provides students with a smooth user experience by letting them enter their DASS results and get personalised recommendations.

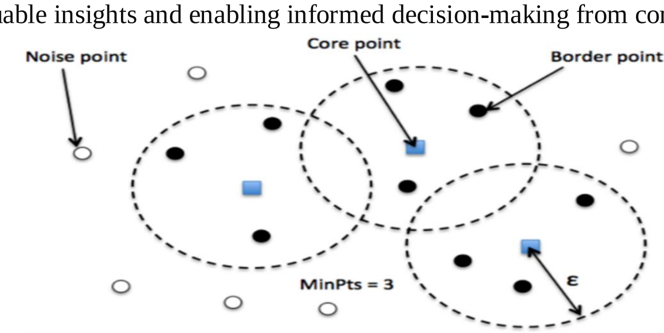
With a focus on assisting students at every stage of their academic career, DASS Monk aims to improve student mental health by providing individualised, data-driven interventions. Examining the students' levels of stress, anxiety, and depression was the aim of the study, which also produced a report for the excellent guide. It was found that there were a lot of issues with the traditional methods of coaching the kids, such as reluctance to disclose the issues. This section displays the DASS Monk's fundamental components. This explains the system's advantages and displays the software development platforms that are being employed. The most often used algorithm for putting record-keeping systems into place in the healthcare sector is DBScan.

A. *Machine Learning*

The use of machine learning techniques has grown significantly, leading to improvements in tasks related to anomaly detection, classification, clustering, and predictive modelling. Improved insights, forecasts, and process optimisation have been attained as a consequence of researchers' exploration of several methods and approaches suited to particular problems and specifications. Machine learning finds use in many domains, such as risk assessment, consumer segmentation, predictive maintenance, and personalised suggestions.

In data analysis and machine learning, clustering is a basic technique used to group comparable data points according to predetermined criteria. Without requiring labelled data, the goal of clustering is to find innate structures in the data, such as organic groupings or patterns. Clustering algorithms make tasks like pattern recognition, data compression, and outlier detection easier by grouping data into clusters. There are several clustering methods available, and each one has a unique method for creating clusters and allocating data points to them. These algorithms fall into four general categories: density-based, model-based, hierarchical, and partitioning approaches.

Examples of popular clustering algorithms include k-means, hierarchical clustering, DBSCAN, and Gaussian mixture models. Clustering finds applications in diverse fields, including image segmentation, customer segmentation, document clustering, and anomaly detection, providing valuable insights and enabling informed decision-making from complex datasets.



B. *DBScan Algorithm*

Clustering techniques are essential in the field of machine learning algorithms because they help reveal hidden patterns and structures in datasets. The capacity to recognise clusters of any size and shape based on data density makes the DBSCAN (Density-Based Spatial Clustering of Applications with Noise) algorithm unique among these methods. DBSCAN was developed in 1996 by Martin Ester, Hans-Peter Kriegel, Jörg Sander, and Xiaowei Xu. It has a number of important benefits, such as being parameter-free, resilient against noise, and capable of handling large datasets with ease.

Numerous fields, such as geospatial analysis, image processing, and anomaly detection, have found extensive uses for DBSCAN. DBSCAN is used in geospatial analysis to find regions of interest, group GPS locations, and find spatial patterns in geographic datasets. Similarly, DBSCAN divides images into meaningful parts based on pixel density and similarity, which helps with image segmentation in image processing jobs. Furthermore, DBSCAN is useful for anomaly detection jobs in a variety of applications, including fraud detection, intrusion detection, and fault diagnostics, due to its capacity to differentiate outliers from regular data points.

III. METHODOLOGY

Numerous fields, such as geospatial analysis, image processing, and anomaly detection, have found extensive uses for DBSCAN. DBSCAN is used in geospatial analysis to find regions of interest, group GPS locations, and find spatial patterns in geographic datasets. Similarly, DBSCAN divides images into meaningful parts based on pixel density and similarity, which helps with image segmentation in image processing jobs. Furthermore, DBSCAN is useful for anomaly detection jobs in a variety of applications, including fraud detection, intrusion detection, and fault diagnostics, due to its capacity to differentiate outliers from regular data points.

The research heavily relies on machine learning, using clustering algorithms to divide pupils into groups according to mental health indicators. By using methods like the DBSCAN algorithm, the system separates students into discrete groups so that recommendations that are specific to each student's needs can be sent. Furthermore, as a result of user interactions and feedback, the machine learning algorithms are constantly learning and improving their recommendation tactics to maximise efficacy over time.

By incorporating robust feedback loops, the project gathers user input to evaluate the efficacy of recommendations and identify areas for improvement. Systematic collection and analysis of user feedback ensure that the platform remains responsive to evolving student needs and preferences, fostering a dynamic environment for continuous improvement.

Ongoing optimization efforts are integral to the project's methodology, focusing on refining algorithms and data processing techniques to enhance overall efficiency and performance. Regular evaluation and refinement of algorithmic models aim to improve the accuracy and relevance of recommendations, while streamlining data processing pipelines minimises computational overhead and maximises resource utilisation.

Scalability is an essential component to guarantee that the system architecture can accommodate growing numbers of users and increasing data volumes. The project can grow without compromising efficiency by utilising scalable technology and distributed computing frameworks. By conducting frequent capacity planning and scalability testing, the team may anticipate future growth and take proactive steps to address expected scaling challenges.

The goal of the DASS Monk project is to successfully address issues about student well-being by utilising machine learning capabilities and data-driven insights through the integration of various approaches. Through individualised support catered to each student's needs, the platform aims to significantly improve students' well-being.

There's a technique that lets you figure out the score and suggest fixes.

Making sure the ML-based DASS Monk delivers the predetermined flow of the system was the main priority. A great deal of care is taken to monitor how the system that will be employed operates. Students can access your whole report as a guide, but they can only take the test and recommendations that are relevant to their treatment. Initially, a patient record would be created and added to the data record based on the student's activities. The student's name, ID, and a few other details are included in the student record.

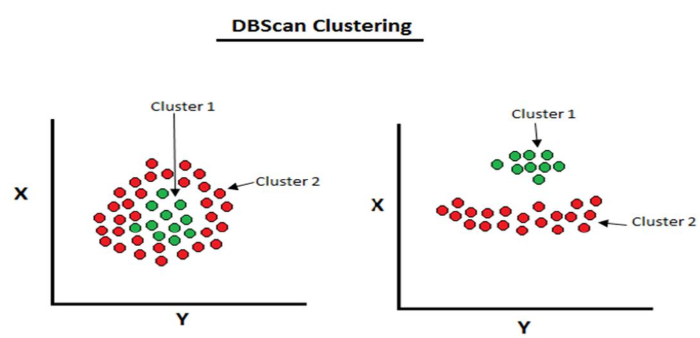


Fig.1 System Architecture

As seen in Fig. 1, the guide will initially receive the student's data, store it, and produce a report. based on their individual IDs, provide particular hospitals restricted access to their medical records. By limiting access to pertinent data to only authorised healthcare practitioners, this individualised strategy will protect patient privacy. More effective hospital identification and data retrieval will enable improved resource management.

IV. CHALLENGES AND BENEFITS

Improving DASS-Monk offers a number of advantages and challenges with the goal of enhancing user experience and promoting student wellbeing in dynamic learning environments. Integration of wearables for real-time physiological data presents unique challenges, including managing technical intricacies and guaranteeing data security. Robust algorithms and computer resources are necessary for advanced sentiment analysis since it presents challenges for effectively comprehending varied linguistic subtleties and cultural settings. Comparably, in order to guarantee accurate translations and widespread accessibility, multilingual support necessitates overcoming linguistic complexity and cultural sensitivities.

To ensure equitable and inclusive support, machine learning algorithms for personalised suggestions require high-quality data and meticulous algorithmic bias reduction. Furthermore, in order to ensure market penetration and compatibility, growing the platform into a larger educational environment necessitates strategic alliances and integration activities. Notwithstanding these difficulties, there are numerous advantages to these improvements. They offer real-time data via wearable technology and more precise evaluations through sophisticated sentiment analysis, promising a more comprehensive user experience.

Support for many languages increases accessibility and promotes inclusivity among people from different linguistic and cultural backgrounds. Machine learning algorithms-driven personalised recommendations provide customised assistance, encouraging proactive mental health management and raising user happiness and engagement levels. DASS-Monk's reach is increased by entering the educational ecosystem, providing significant support that goes beyond customary limits. Ongoing research and collaborations guarantee the program's applicability and efficacy in promoting student well-being in the face of changing mental health trends.

V. CONCLUSION

Machine Learning A fresh and creative way to boost kids' self-esteem is through DASS-Monkis. a unique computer programme that solicits feedback from pupils and offers constructive criticism. It can be used by teachers to help students as well. This has the potential to improve learning environments in schools. There are innovative suggestions for improving it in the future. What a wonderful idea it would be to be able to employ wearable technology to monitor pupils' emotions in real time! The goal is to ensure that everyone, regardless of language proficiency, can utilise the programme effectively. With the assistance of professionals and constant learning, we are optimistic that DASS-Monk will continue to improve.

Knowing that student satisfaction and well-being are the most crucial indicators of our success inspires pride in what has been accomplished.

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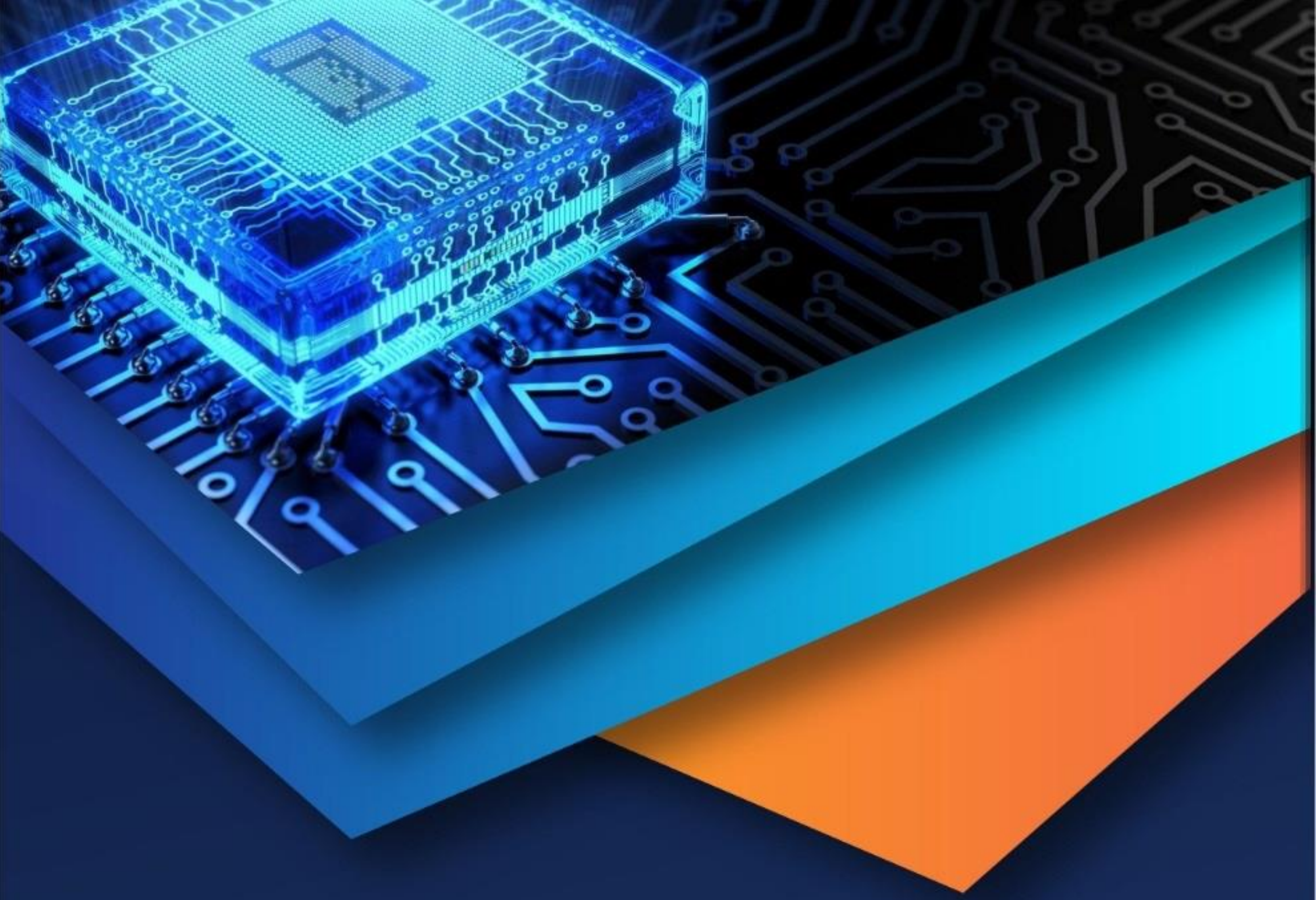

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