**ANXIETY, DEPRESSION AND STRESS PREDICTION AMONG COLLEGE STUDENTS USING MACHINE LEARNING ALGORITHMS**

**ABSTRACT**

Anxiety, Stress and Depression have become common psychological health issues in today’s life. While these health issues have severely affected every age group of people, large number of students are suffering from these issues. The most surprising thing about these issues is that people suffering from them cannot figure out if they have one of these health problems. In this paper, we predicted anxiety, stress and depression using machine learning algorithms. In this paper, we predicted the severity levels of anxiety, stress and depression in college students using machine learning algorithms. DASS21 was used to collect data from 400 students. It is a standard questionnaire used to measure the common signs of anxiety, stress, and depression. The severity levels were mild, normal, moderate, severe, and extremely severe. The classification algorithms that were applied are Support Vector Machine, KNN, logistic regression, decision tree and naive Bayes. Different calculation matrices like accuracy, precision, specificity was used to compare the models. F1 score measure was included because it was found that the classes were imbalanced in the confusion matrix. Thus, it helped find the best model for prediction of these psychological problems.

**OBJECTIVE**

The objective of this project is to develop an improved predictive system for identifying and assessing anxiety, stress, and depression in college students, addressing limitations in existing methods such as data collection bias, generalizability, class imbalance, and model complexity. This system aims to provide accurate, ethical, and widely applicable tools to promote early detection and intervention, ultimately enhancing the well-being and academic success of college students facing these psychological challenges.

**PROBLEM STATEMENT**

In the contemporary educational environment, a significant number of college students are grappling with psychological health issues such as anxiety, stress, and depression. These mental health challenges often go undetected and untreated due to the inability of individuals to recognize their symptoms. The existing system, which employs the DASS21 questionnaire to collect data from 400 students and applies various machine learning algorithms for prediction, faces limitations such as data collection bias, limited generalizability, class imbalance, and model complexity. These challenges hinder the effectiveness and applicability of the system in accurately identifying and predicting the severity levels of these psychological issues among a diverse student population. Therefore, there is a pressing need for an enhanced predictive system that addresses these limitations, offering more accurate, generalizable, and ethically sound methods to identify and assess the mental health of college students. Such a system would not only facilitate early detection and intervention but also contribute to the overall well-being and academic success of students in colleges and universities.

**SYSTEM COMPONENTS**

HARDWARE REQUIREMENTS

|  |  |  |
| --- | --- | --- |
| MINIMUM (Required for Execution) | | MY SYSTEM (Development) |
| System | Pentium IV 2.2 GHz | i3 Processor 5th Gen |
| Hard Disk | 20 Gb | 500 Gb |
| Ram | 1 Gb | 4 Gb |

SOFTWARE REQUIREMENTS

|  |  |
| --- | --- |
| Operating System | Windows 10/11 |
| Development Software | Python 3.10 |
| Programming Language | Python |
| Domain | Image Processing & Cloud Computing |
| Integrated Development Environment (IDE) | Visual Studio Code |
| Front End Technologies | HTML5, CSS3, Java Script |
| Back End Technologies or Framework | Django |
| Database Language | SQL |
| Database (RDBMS) | MySQL |
| Database Software | WAMP or XAMPP Server |
| Web Server or Deployment Server | Django Application Development Server |

**CONCLUSION**

In conclusion, this project aimed to address the prevalent psychological health issues of anxiety, stress, and depression among college students. With machine learning algorithms and the DASS21 questionnaire, we made significant strides in predicting the severity levels of these issues. Our findings indicated that K-Nearest Neighbour performed the best among the applied algorithms, followed by logistic regression. However, it's important to acknowledge the limitations of our approach, including data collection bias, generalizability concerns, class imbalance, and model complexity. These limitations emphasize the need for further research and development of more robust and ethically sound methods to identify and support college students facing mental health challenges. Overall, this project contributes to the ongoing efforts to improve the well-being and academic success of college students by enhancing our ability to detect and address these psychological issues effectively.

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