# PREDICTION OF DEPRESSION AND ANXIETY USING ML TECHNIQUES USING PHQ AND GAD

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## ABSTRACT

***Keywords:*** *Machine learning,Healthcare industry,Mental illness,Depression,Anxiety,PHQ-9 and GAD-7,Dataset,Linear regression,Sentiment analysis.*

***Introduction:*** Depression is a complex illness that affects more than 280 million people worldwide. It can be categorized as long-term or transient and can range from mild to severe. Depression can be caused by biological, social, environmental, personal, and lifestyle factors, and can lead to symptoms such as sadness, hopelessness, loss of interest in activities, and even suicidal thoughts. Low- and middle-income countries face a treatment gap for mental health disorders, making early detection crucial. Machine learning algorithms, such as supervised and unsupervised learning, can be used to identify depression at an early stage through sentiment analysis and prediction models..

***Objectives:***

In this project we are going to perform the following

- To provide an overview of the current state of mental health of a user using PHQ and GAD
- To provide recommendations based on the score and level to the user.
- The recommendations given to the user should help them to decrease the depression and anxiety score and level over the period of time.
- To provide the sentiment analysis score for the content written by the user.
- To provide the graphical representation of the PHQ and GAD scores of the user.

***Methodology:***

- The PHQ is a questionnaire used to determine a patient's mental health, primarily for depression evaluation. It consists of 9 questions with scores ranging from 0 to 27, based on the patient's responses over the past two weeks.

- The Generalized Anxiety Disorder (GAD) assessment involves a set of 7 questions that evaluate the severity level of anxiety symptoms, such as excessive worry and restlessness. Scores range from 0 to 27, and higher scores indicate a higher severity level.

- Sentiment analysis is a technique used to determine the patient's emotional state by analyzing their text diaries. The sentiment score is computed and used to determine the appropriate course of treatment based on the severity level.

- Linear regression is a statistical modeling technique that utilizes a line to show the relationship between one or more independent variables and a dependent variable. This technique is commonly used to find patterns, make predictions, and test theories in various disciplines such as economics, psychology, and medicine.

***Results and Conclusions:***

We have developed a website which provides a practical and efficient method for assessing and monitoring depression and anxiety. By using modern technologies, such as HTML, PHP, CSS, JavaScript, Python, and PHPMyAdmin, we can accurately predict PHQ-9 and GAD-7 scores and track weekly progress through informative graphs. The website's features can assist patients in taking proactive steps towards managing their mental health, while also providing therapists with valuable insights into their patient's progress. With further research and development, the use of technology in mental health could prove to be a significant breakthrough in improving the quality of life for individuals living with depression and anxiety.