# Mental Health Assessment Using Data Mining Techniques

## 1. Aim

The aim of this project is to develop a **story-driven mental health assessment system** that utilizes **data mining techniques** to analyze user responses and detect potential mental health conditions. The project seeks to replace traditional questionnaire-based methods with an engaging, scenario-based approach while ensuring **accurate evaluation and personalized recommendations** using machine learning models.

## 2. Objectives

* To collect and analyze **mental health-related data** through user interactions in story-driven scenarios.
* To apply **data mining techniques** for detecting patterns and trends in mental health conditions.
* To develop and train **machine learning models** that can predict mental health disorders based on user responses.
* To provide **personalized suggestions** based on the detected conditions, such as lifestyle changes, therapy recommendations, and educational resources.
* To ensure **data privacy and compliance** with regulations like **GDPR and HIPAA** while handling sensitive user information.
* **The project does not replace professional consultation but rather encourages users to be aware of their mental health and take proactive steps.**

## 3. Scope

This project focuses on analyzing mental health conditions using **data-driven insights** and **interactive storytelling**. The system assesses user mental health through a combination of **subjective responses** (scenario-based choices) and **objective inputs** (sleep hours, stress levels, etc.).

### In-Scope Features:

✅ **Story-driven mental health evaluation** (anxiety, stress, depression, sleep disorders, etc.) ✅ **Data collection & preprocessing** from user responses and real-world factors ✅ **Machine learning models** for classification and pattern recognition ✅ **Personalized recommendation system** for therapy, lifestyle changes, and reading materials ✅ **Graphical reports & insights** for users to track their mental health trends

### Out of Scope:

❌ The system does not provide a **medical diagnosis** or replace professional therapy. ❌ No **real-time doctor consultation** or social interaction features. ❌ No direct **integration with medical records** from hospitals or clinics.

## 4. Problem Domain

Mental health issues are becoming increasingly prevalent, yet many individuals may not always recognize the need for professional help due to a lack of awareness, misconceptions about mental health, or uncertainty about available resources. Many people also feel **uncomfortable with traditional assessment methods** that rely on direct questioning, leading to biased responses and reluctance to engage.

This project addresses these challenges by using **interactive storytelling** to make the assessment more natural and engaging. Users can periodically reassess their mental health by retaking the assessment to track changes over time. The integration of **data mining** allows for more accurate predictions and **early identification of mental health concerns**, helping users take proactive steps toward well-being. **If the assessment indicates a severe condition, the app explicitly recommends seeking professional help to ensure timely intervention.**

## 5. Dataset Description

The dataset used in this project consists of **40,960 entries** and **55 attributes**, covering various mental health indicators. The key features include:

* **Mental health symptoms**: Anxiety, stress, depression-related indicators.
* **Lifestyle factors**: Sleep hours, screen time, exercise habits, diet quality.
* **Demographics**: Age, gender, occupation.
* **Psychological test scores**: PHQ-9, GAD-7, stress levels.
* **Machine learning features**: Preprocessed bins for sleep, screen time, workload stress.
* **Target Variable**: Disorder classification.

The dataset is preprocessed and structured to enable **pattern recognition and predictive modeling** using data mining techniques.

## 6. Literature Survey

Several research studies and existing models highlight the effectiveness of **data mining techniques in mental health assessment**. Key references include:

* **“Machine Learning for Mental Health Prediction”** – Discusses the use of supervised learning models like Decision Trees, SVM, and Neural Networks in mental health analysis.
* **“Storytelling in Digital Mental Health Interventions”** – Highlights the impact of gamification and interactive storytelling in reducing assessment bias.
* **“Predicting Anxiety and Depression Using Data Mining”** – Shows the effectiveness of using PHQ-9 and GAD-7 scores for automated mental health detection.
* **“Privacy-Preserving Machine Learning in Healthcare”** – Addresses the challenges of handling sensitive user data while ensuring compliance with GDPR and HIPAA.

The project builds on these insights by integrating **interactive storytelling** with **machine learning-based disorder detection**, ensuring both **engagement and accuracy** in mental health assessments.