



# International Journal of Innovative Research in Computer and Communication Engineering

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# Mental Health Detection Using NLP from Journal Entries

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**ABSTRACT:** This paper presents Mental Health Detection using NLP from Journal Entries, a web-based system designed for real-time emotion and mental health analysis. The platform processes user-provided journal text and voice inputs through voice-to-text transcription and applies Natural Language Processing (NLP) techniques for analysis. The system follows a rule-based approach that combines keyword detection and basic text processing to identify emotional patterns.

It classifies various emotional states and detects key mental health indicators such as stress, anxiety, and depression. The system also integrates user authentication and secure data handling to ensure privacy and reliability. The processed results are presented through an interactive interface, allowing users to understand their emotional state effectively.

The system demonstrates efficient performance in analyzing textual data and identifying emotional trends with consistent accuracy based on predefined rules. This approach makes the system lightweight, fast, and easy to implement without requiring complex machine learning models.

The proposed system can be used as a supportive tool for mental health awareness, enabling early identification of emotional changes and encouraging timely intervention. However, it is intended only as an assistive system and not as a replacement for professional medical diagnosis.

**KEYWORDS:** Emotion Detection, Natural Language Processing (NLP), Mental Health Analysis, Journal Entry Analysis, Rule-Based System, Sentiment Analysis, Voice-to-Text Processing, Text Classification

## I. INTRODUCTION

### 1.1 Introduction

The Mental Health Detection System Using NLP from Journal Entries makes it easier for users to understand their emotional and psychological state by analyzing their daily written thoughts. In today's fast-paced world, mental health issues such as stress, anxiety, and depression are increasing, but many individuals are unable to recognize or express their feelings effectively. This system provides a digital solution that helps users monitor their mental well-being through simple journal entries.

Natural Language Processing (NLP) plays a vital role in analyzing human language and extracting meaningful information from textual data. To accomplish this task, the system first accepts user input in the form of text or voice. If voice input is provided, it is converted into text using voice-to-text processing. The text is then preprocessed through various NLP techniques such as tokenization, stop-word removal, and normalization to prepare it for analysis.

After preprocessing, the system uses keyword-based feature extraction methods to identify important emotional indicators present in the text. A rule-based classification approach is then applied to categorize the user's emotional state into different classes such as happiness, sadness, stress, or anxiety. Based on these emotions, the system further determines the user's mental health condition and provides meaningful insights.

The results are displayed through a user-friendly web interface, allowing users to easily interpret their emotional patterns over time. The system is designed to be simple, efficient, and accessible, making it suitable for everyday use without requiring complex machine learning models.



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(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Overall, this system demonstrates how NLP techniques combined with rule-based analysis can be effectively used to support mental health awareness and encourage early identification of emotional changes, thereby promoting better well-being.

### 1.2 Project Motivation

The project aims to assist individuals in understanding and monitoring their mental health by analyzing their daily journal entries. In today's world, many people experience stress, anxiety, and emotional imbalance but often struggle to recognize or express their feelings effectively. The lack of awareness and timely identification of mental health issues can lead to serious consequences, making it important to provide a simple and accessible solution for early detection. To address these challenges and promote mental well-being in everyday life, a system is developed that analyzes user-written text using Natural Language Processing (NLP) techniques. The system processes journal entries, extracts meaningful emotional patterns, and classifies the user's mental state using a rule-based approach. By integrating features such as voice-to-text input, emotion detection, and result visualization, the project provides a user-friendly platform that can be used in personal wellness tracking, educational environments, and healthcare support systems, encouraging better emotional awareness and timely intervention.

### 1.3 Problem Statement

Despite advancements in digital health technologies, several limitations persist in current mental health screening approaches:

1. Limited accessibility to qualified mental health professionals
2. High costs and long waiting times for clinical evaluations
3. Social stigma associated with discussing mental health issues
4. Lack of continuous and real-time emotional monitoring
5. Delayed detection of critical mental health conditions

### 1.4 Research Objectives and Contributions

This study aims to address the challenges of identifying and monitoring mental health conditions by developing an efficient and accessible system using Natural Language Processing (NLP). The primary objective is to design a system capable of analyzing unstructured journal text and voice input to detect emotions and assess mental health conditions in real time. The system focuses on implementing a rule-based classification approach to identify emotional states such as happiness, sadness, stress, and anxiety, and to provide meaningful insights into the user's psychological well-being.

Another key objective is to develop a user-friendly web application that allows users to easily input their journal entries, either through text or voice-to-text transcription, and view the analyzed results in a clear and understandable format. The system also aims to evaluate its performance in terms of accuracy, responsiveness, and reliability in emotion detection and mental health analysis.

The major contributions of this project include the development of a comprehensive emotion detection framework based on NLP techniques, integration of mental health classification for identifying potential psychological conditions, and support for multimodal input through voice-to-text processing. Additionally, the system provides simple insights to help users understand their emotional patterns and promotes early awareness of mental health issues.

The project also demonstrates a scalable and efficient web-based application with secure user authentication and data storage, making it suitable for real-world usage in personal wellness tracking and support systems.

## II. SYSTEM ARCHITECTURE AND DESIGN

### 2.1 System Overview

The *Emotions Tracker* system is designed using a **modular, layered architecture** to enable scalable, efficient, and real-time processing of user inputs. The system supports both **text and voice inputs**, ensuring accessibility and flexibility.

The architecture is divided into three primary layers:

1. **Frontend Layer:** Handles user interaction and visualization
2. **Core Processing Layer:** Performs NLP, emotion detection, and mental health classification
3. **Backend Services Layer:** Manages authentication, data storage, and system integration



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### 2.2 Technology Stack

The system leverages modern web technologies to ensure performance, scalability, and user experience.

## Tech Stack

Component	Technology Used	Purpose
Frontend	React + TypeScript	Building user interface
Build Tool	Vite	Fast development and build
Styling	Tailwind CSS	UI design and styling
Routing	React Router	Navigation between pages
State Management	React Query (TanStack)	Handling API data efficiently
NLP Processing	Rule-Based NLP (Custom Logic)	Text analysis and emotion detection
Voice Processing	Web Speech API	Voice-to-text conversion
Backend & Database	Supabase	Data storage and backend services
Authentication	Supabase Auth	User login and security
Deployment	Vite Preview / Web Hosting	Running and deploying the app

### 2.3 Core Modules

#### 2.3.1 NLP Processor Module

##### Purpose:

The NLP Processor Module is responsible for preprocessing user input text and extracting meaningful linguistic features required for emotion detection and mental health analysis. This module performs essential operations such as text cleaning, tokenization, stopword removal, and normalization to convert raw text into a structured format.

The system applies keyword extraction techniques to identify emotionally relevant words and phrases. It also performs basic context handling by analyzing nearby words to improve interpretation. The preprocessing pipeline ensures that irrelevant words are filtered out and only significant terms are retained for further processing.

The processing flow includes tokenization, normalization, stopword filtering, keyword extraction, and feature preparation, which is then passed to the emotion detection module.

#### 2.3.2 Emotion Engine Module

##### Purpose:

The Emotion Engine Module is designed to identify and classify emotions from the processed textual input. It uses a rule-based approach where predefined keyword sets are mapped to specific emotional categories.

The system supports multiple emotional states such as happiness, sadness, anger, stress, anxiety, and neutral conditions. It analyzes the presence and frequency of emotion-related keywords to determine the dominant emotional state. The module also assigns a basic confidence level based on keyword occurrence and intensity. Additionally, it categorizes overall sentiment into Positive, Negative, or Neutral.



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Output includes:

- Primary detected emotion
- Sentiment classification (Positive/Negative/Neutral)
- Identified keywords
- Basic confidence score

### 2.3.3 Mental Health Classifier Module

#### Purpose:

The Mental Health Classifier Module evaluates the user's psychological condition based on detected emotional patterns. It uses rule-based classification logic to map emotions into mental health categories.

The system classifies user states into categories such as Normal, Mild Stress, Anxiety, and Depression indicators. The classification is based on the presence of negative emotional patterns and their frequency.

The module generates outputs including mental health status and simple recommendations for improving emotional well-being.

### 2.3.4 Voice Processing Module

#### Purpose:

The Voice Processing Module enables users to provide input through speech, enhancing accessibility and user interaction. It captures audio input using browser-based APIs and converts it into text using speech-to-text technology.

The converted text is then passed to the NLP Processor Module for further analysis. The module also provides visual feedback during recording to improve user experience.

### 2.3.5 System Workflow

The system workflow begins with user authentication, ensuring secure access to the application. Users can then provide input in the form of text or voice. If voice input is given, it is first converted into text using speech-to-text processing.

The text is then passed through the NLP pipeline, where it undergoes tokenization, normalization, stopword removal, and keyword extraction. The processed data is then sent to the Emotion Engine, which identifies the emotional state using rule-based classification.

Next, the Mental Health Classifier evaluates the emotional patterns to determine the user's mental health condition. The results are then stored in the database using Supabase for future reference.

Finally, the system displays the analyzed results through an interactive user interface, including detected emotions, mental health status, and basic recommendations.

### 2.3.6 Proposed System

The proposed system is a web-based Mental Health Detection platform designed to analyze user journal entries and provide insights into emotional and psychological states. The system focuses on simplicity, efficiency, and accessibility by using rule-based NLP techniques instead of complex machine learning models.

It supports both text and voice input, enabling flexible interaction. The system processes user input in real-time and provides immediate feedback on emotional conditions.

Key Features:

- Real-time emotion detection
- Text and voice input support
- Mental health classification
- Simple and fast rule-based processing
- User-friendly interface





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The diagram represents a rule-based NLP pipeline for emotion detection and mental health analysis using journal entries. The system processes user input in the form of text or voice and converts it into meaningful insights through multiple stages.

In the input phase, users provide journal entries either directly as text or through voice input, which is converted into text using speech-to-text processing. The text then undergoes preprocessing, which includes tokenization, normalization, and stopword removal to clean and standardize the data.

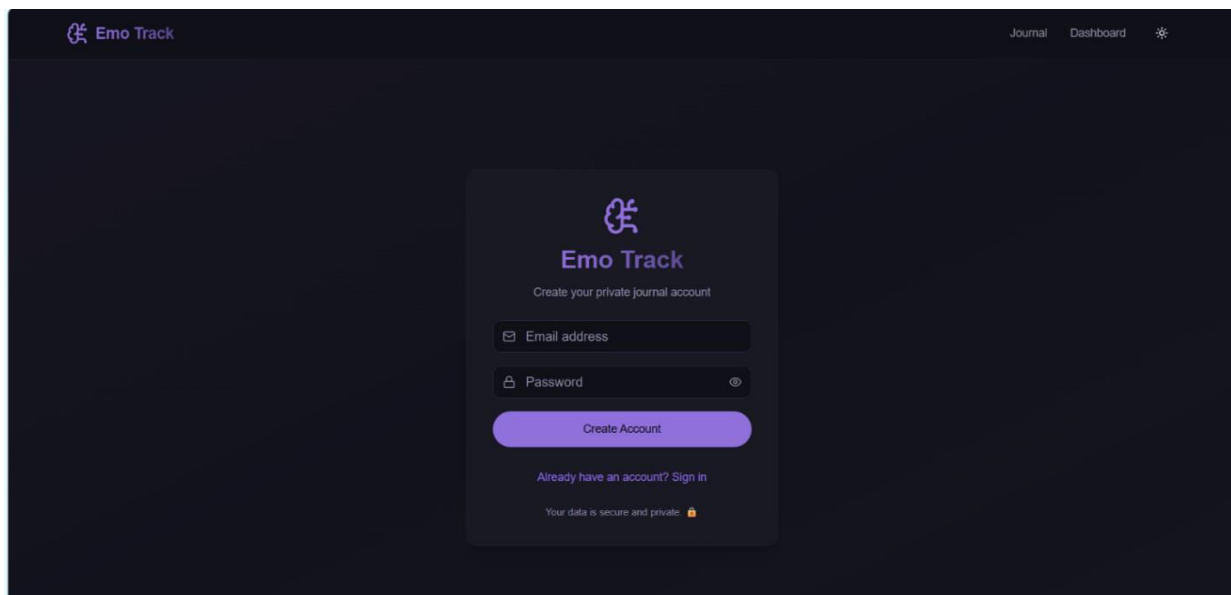
Following preprocessing, keyword extraction is performed to identify important emotional terms and phrases present in the text. These extracted features are then passed to the Emotion Engine, where rule-based classification is applied to determine the user's emotional state based on predefined keyword mappings.

The detected emotional patterns are further analyzed by the Mental Health Classifier, which evaluates the user's psychological condition and categorizes it into different levels such as normal, stress, anxiety, or depression indicators.

Finally, the results are stored in the database and displayed through the user interface. The system outputs include detected emotions, mental health status, and basic recommendations. This workflow demonstrates how rule-based NLP techniques can be effectively used to analyze textual data and provide meaningful mental health insights without relying on complex machine learning models.

### IV. RESULTS SCREENSHOTS

#### REGISTER PAGE:

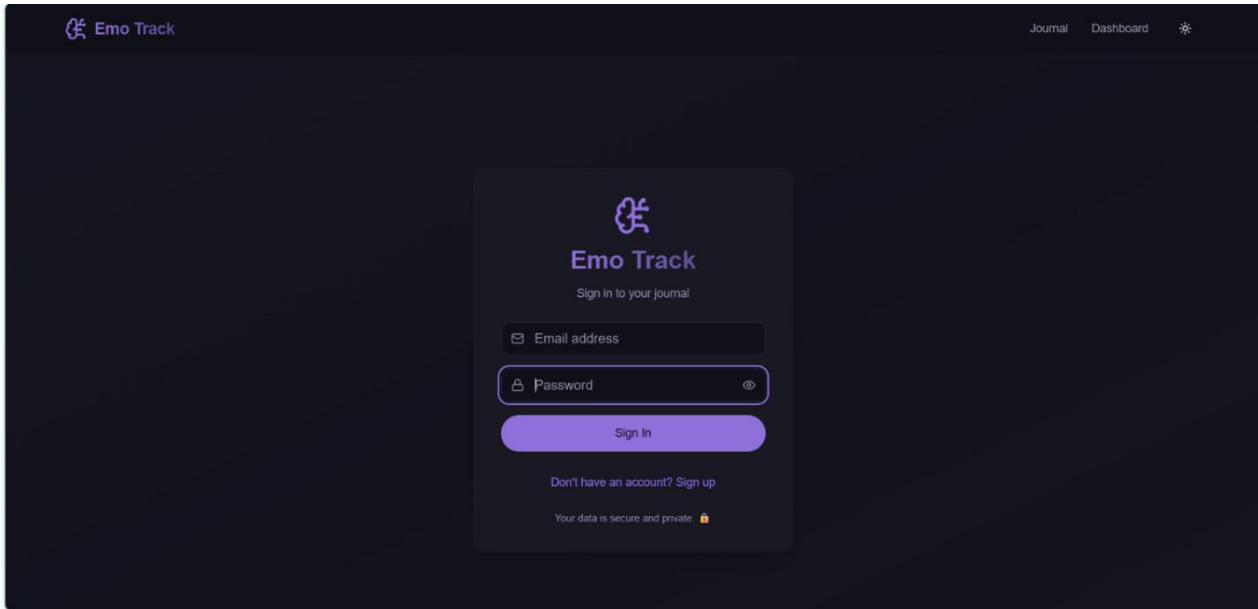




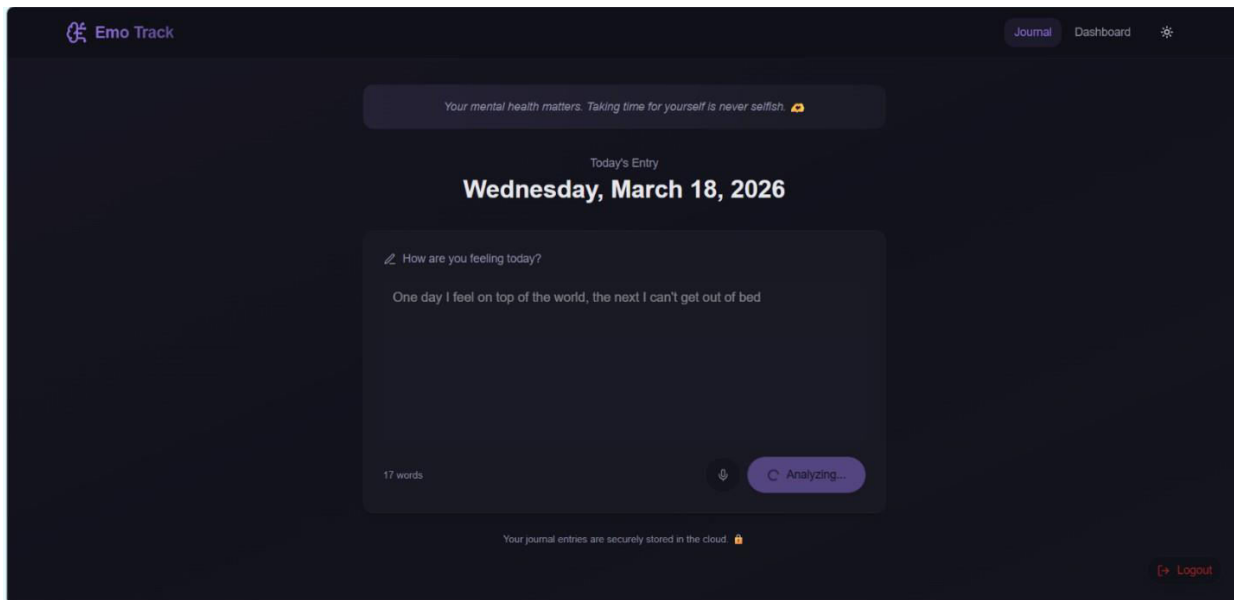
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## SIGN IN PAGE:



## HOME PAGE:

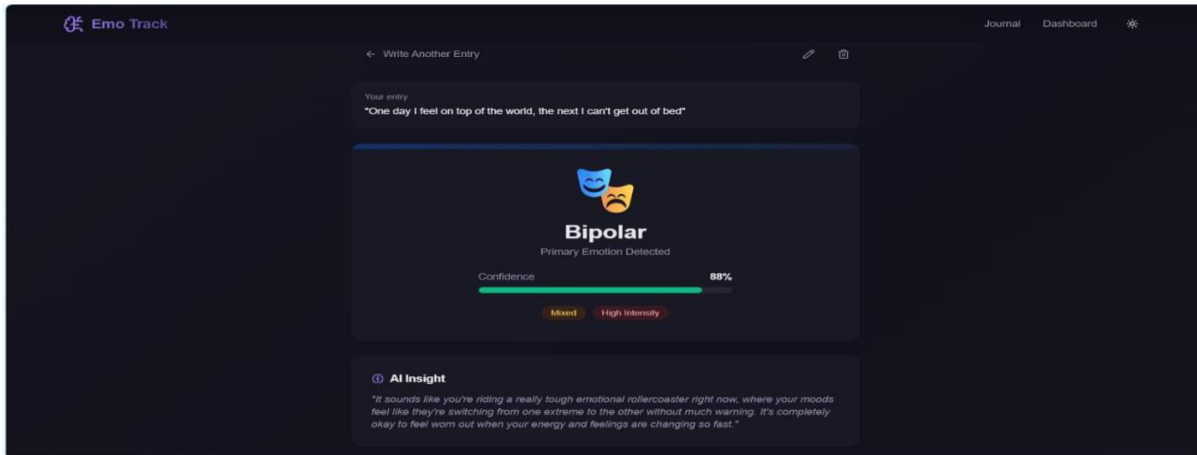




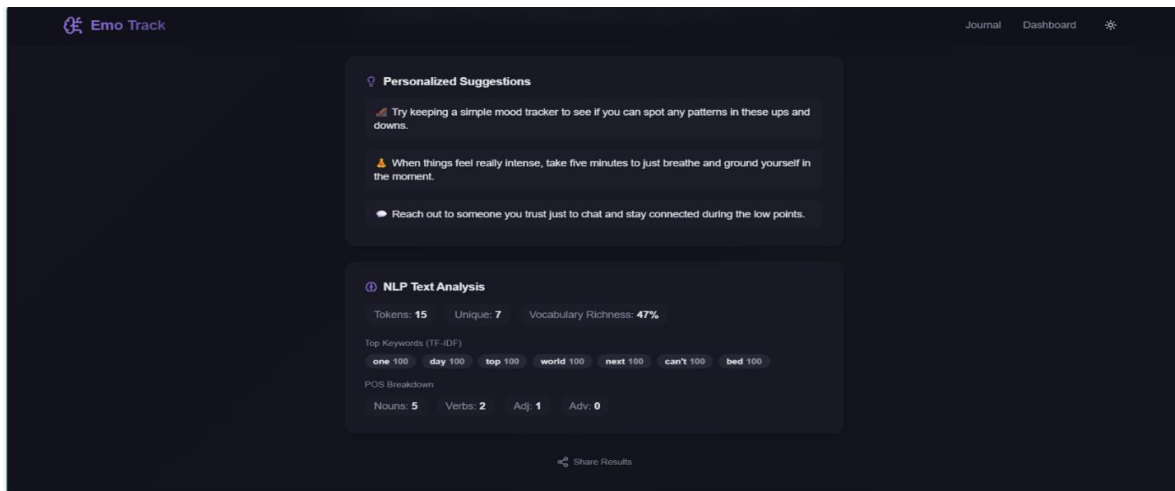
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## OUTPUT:



## SUGGESTIONS AND NLP ANALYSIS BOX:(OUTPUT)



## DASHBOARD:

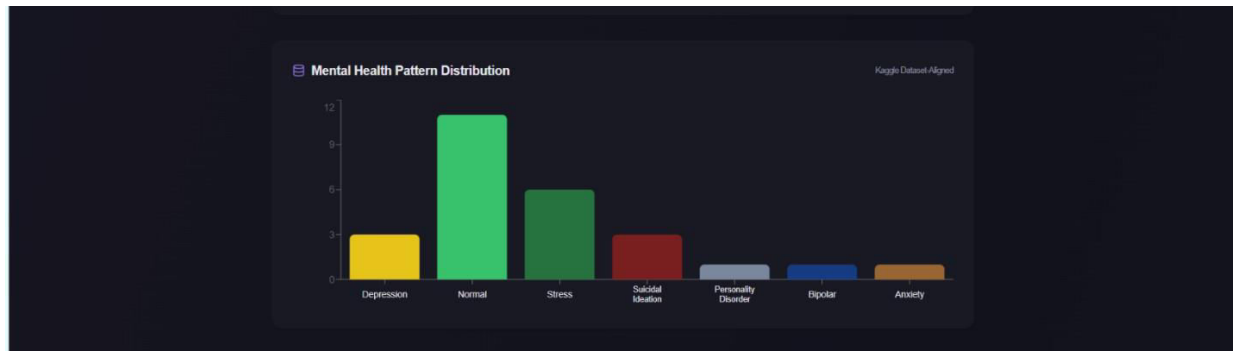




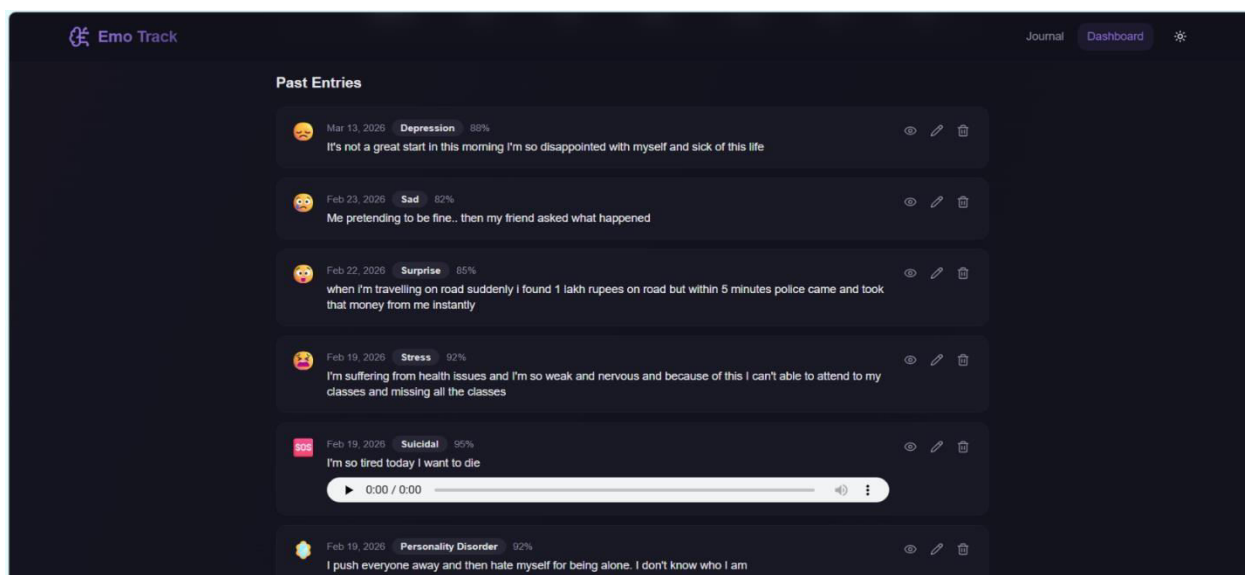
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### MENTAL HEALTH ANALYSIS: (BASED ON DATASET)



### SAVED JOURNAL ENTRIES:



## V. CONCLUSION

The proposed Mental Health Detection System using NLP from Journal Entries demonstrates the effectiveness of a rule-based approach for real-time emotion detection and mental health analysis. The system successfully processes user input in the form of text and voice, performs NLP-based preprocessing, and identifies emotional patterns using keyword-based classification techniques.

The integration of NLP processing, emotion detection, and mental health classification provides a simple yet efficient framework for understanding user emotions and identifying potential mental health concerns. The system also supports multimodal input, enhancing usability and accessibility for a wide range of users.

Although the system does not rely on machine learning models, it delivers consistent and reliable results based on predefined rules, making it lightweight and easy to implement. The use of a

web-based platform with secure data storage further improves scalability and user experience. Future enhancements can include the integration of machine learning or deep learning models for improved accuracy, support for multilingual inputs, and advanced analytics for deeper insights. Additionally, ensuring data privacy, ethical usage, and system transparency is essential for real-world deployment.



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Overall, the system serves as a useful tool for mental health awareness and early detection, encouraging users to monitor their emotional well-being and seek timely support when necessary.

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