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Personalized Mental Well-Being & Lifestyle Insight App for College Students

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Abstract — College students today often face stress, low motivation, and unhealthy lifestyle habits that affect their overall well-being. Many existing mental health apps are complex or attempt diagnosis, which can be unsafe without professional support. This project proposes a Personalized Mental Well-Being and Lifestyle Insight Application that provides a simple, safe, and non-diagnostic platform for students. The app allows users to track their mood through weekly check-ins, monitor lifestyle habits, and select activities that make them happy. Based on this data, it generates personalized suggestions using a rule-based approach and offers motivational support through a chatbot.

The system focuses on privacy, simplicity, and ethical design, making it a practical solution to help students better understand and improve their well-being.

Index Terms — Mental Well-Being, Lifestyle Tracking, Student Health, Personalized Insights, Rule-Based System, Mood Monitoring, Non-Diagnostic Application, Privacy, Chatbot Support.

I. INTRODUCTION

Mental well-being plays an important role in the overall development and academic performance of college students. In today's fast-paced environment, students often experience stress, low motivation, irregular sleep patterns, and unhealthy daily routines. These factors can negatively affect both their mental and physical health.

Although many mental health applications are available, most of them have certain limitations. Some applications are too complex to use, while others focus heavily on analytics and scoring systems that may create unnecessary pressure. Additionally, a few apps attempt to diagnose mental health conditions without professional supervision, which can be unsafe and misleading.

Initially, this project aimed to develop an AI-based system that could detect emotions using video, audio, and text analysis. However, after consulting psychiatrists, it was understood that such approaches are not reliable for mental health assessment and may raise ethical concerns. Experts suggested avoiding diagnosis and focusing instead on simple, safe, and user-friendly solutions.

Based on this guidance, the project was redesigned as a Personalized Mental Well-Being and Lifestyle Insight Application. The main goal of this system is to help students understand their mood and daily habits without judging or diagnosing them. The application provides simple weekly check-ins, tracks lifestyle activities, and offers personalized suggestions using a rule-based approach.

Overall, this project focuses on creating a safe, ethical, and easy-to-use platform that supports students in improving their well-being through awareness and small positive changes in their daily life.

II. PROBLEM STATEMENT

College students often face stress, poor sleep, and low motivation, but they lack simple and safe tools to understand their mental well-being. Existing applications are either too complex, focus only on limited features, or attempt to diagnose mental health conditions, which can be unsafe.

There is a need for a simple, non-diagnostic, and student-focused application that helps users track their mood, lifestyle habits, and personal activities while providing safe and meaningful insights.

III. OBJECTIVES OF STUDY

The main objective of this project is to develop a simple, safe, and user-friendly application that helps college students understand and improve their mental well-being.

The specific objectives are:

1) To design a non-diagnostic well-being platform that avoids medical judgments

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2) To provide a weekly mood check-in system using simple questions
3) To track lifestyle habits such as sleep, activity, and daily routines
4) To allow users to add personal happiness activities for better personalization
5) To generate personalized insights and suggestions using rule-based logic
6) To ensure data privacy, security, and user consent
7) To create a simple and intuitive user interface using emojis, sliders, and minimal input

Overall, the goal is to support students in maintaining a healthy lifestyle and better self-awareness in a safe and ethical way.

IV. LITERATURE REVIEW

In recent years, several mobile applications have been developed to support mental health and well-being. These applications mainly fall into three categories: mood tracking apps, meditation apps, and habit tracking apps. Each of these provides certain useful features but also has notable limitations.

Mood tracking applications allow users to record their emotions regularly and observe patterns over time. However, many of these apps present results in the form of scores or ratings, which can sometimes create pressure or negatively affect the user's mindset.

Meditation applications focus on relaxation techniques such as guided meditation, breathing exercises, and stress relief practices. While they are helpful in reducing stress, they often lack personalization and do not consider individual lifestyle habits or daily routines.

Habit tracking applications help users monitor activities like sleep, exercise, and productivity. Although they are useful for improving routines, they do not focus on emotional well-being or mental health aspects.

From the study of these existing applications, several gaps were identified. Most platforms either focus on a single aspect or provide overly complex analytics. Many lack personalization and are not specifically designed for college students. Additionally, some applications raise concerns regarding privacy and attempt to provide diagnostic results without proper medical support.

Based on these observations, the proposed system aims to combine the useful features of these applications while removing harmful elements such as scoring and diagnosis. It focuses on providing a simple, personalized, and safe solution that integrates mood tracking, lifestyle habits, and happiness activities into a single platform.

V. SYSTEM ARCHITECTURE

The proposed system follows a layered architecture that separates user interaction, data processing, and data storage to ensure scalability, security, and efficient performance. The architecture is designed to provide a smooth flow of data while maintaining user privacy as well as simplicity.

1) *Overall Architecture Design*

The system consists of the following major components:

- Mobile Application (Frontend)
- Backend API Layer
- Database System
- Insight Engine
- Admin Dashboard

Each component performs a specific role and communicates with others through secure APIs.

2) *Frontend Layer (Mobile Application)*

Developed using Flutter for cross-platform compatibility.Acts as the user interaction layer.

Responsible for:

- Collecting user inputs (mood, lifestyle data, activities)
- Displaying insights and suggestions
- Providing chatbot interface

The UI is designed to be simple and interactive, using emojis, sliders, and minimal text input.

3) *Backend Layer (API Services)*

Implemented using FastAPI or Node.js.

Acts as the core processing unit of the system.

Handles:

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- Request processing from frontend
- Business logic execution
- Communication with database
- Integration of NLP and recommendation modules

4) Database Layer

Uses Firebase Firestore as a cloud-based NoSQL database.

Stores:

- User information and consent data
- Mood assessment records
- Lifestyle tracking data
- Happiness activities

The database ensures real-time updates, scalability, and secure storage.

5) Authentication Module

Managed using Firebase Authentication.

Provides:

- Secure login and registration
- Unique user identification
- Access control for protected resources

6) Insight Engine (Recommendation Module)

A dedicated component responsible for generating insights.Uses rule-based logic instead of complex machine learning models.

Processes data from:

- Mood assessments
- Lifestyle tracking
- User-selected activities

Outputs personalized suggestions that are safe and non-diagnostic.

7) Chatbot Module

Integrated within the system to provide interactive support.Uses basic NLP techniques for:

- Sentiment detection
- Keyword-based responses

The chatbot enhances user engagement by providing motivational and supportive communication.

8) Admin Dashboard

Developed using React.js and Chart.js.Displays aggregated and anonymized data such as:

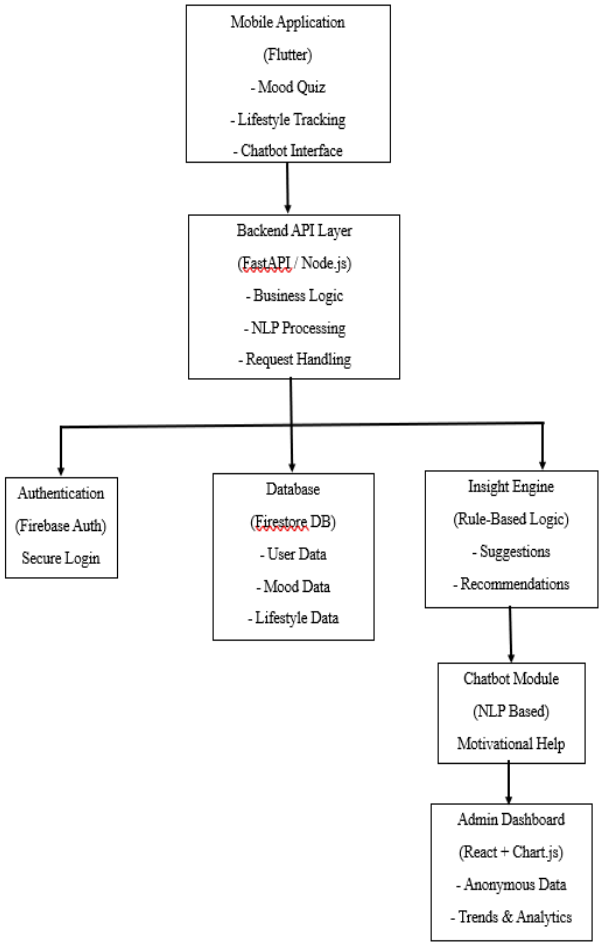
- Average sleep patterns
- Stress trends
- Activity levels

Ensures that no personal user data is exposed.

9) Data Flow in System

- User interacts with the mobile application
- Data is sent to backend APIs
- Backend processes and stores data in Firestore
- Insight engine analyzes the data
- Suggestions are generated and sent back to frontend
- Admin dashboard accesses only aggregated data

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VI. SYSTEM DESIGN AND WORKFLOW

A. System Design

The proposed system is designed as a simple, user-friendly, and modular application that ensures safe interaction and efficient processing of user data. The design focuses on non-diagnostic support, privacy, and personalization.

The system follows a three-layer architecture design, ensuring separation of responsibilities:

1) Presentation Layer (User Interface)

Implemented using Flutter mobile application

Provides an easy-to-use interface with:

- Emoji-based mood input
- Sliders and buttons
- Minimal typing requirement

Allows users to:

- Complete weekly mood check
- Track lifestyle habits
- View insights
- Interact with chatbot

2) Application Layer (Backend Processing)

Developed using FastAPI / Node.js

Responsible for:

- Handling user requests
- Processing input data

- Applying business logic
- Running NLP for chatbot

Connects frontend with database and insight engine

3) Data Layer (Database & Storage)

Uses Firebase Firestore for storing:

- User details and consent
- Mood assessment data
- Lifestyle tracking data
- Happiness activities

Ensures:

- Real-time updates
- Secure data storage

4) Insight Engine (Core Logic)

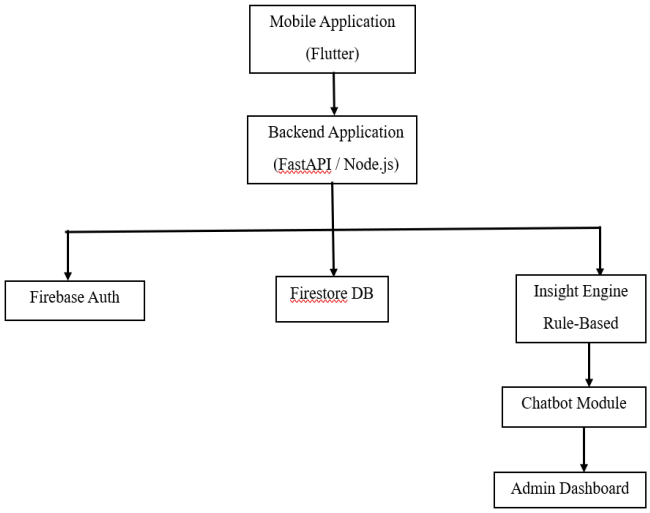
Uses rule-based recommendation system. Generates safe and personalized suggestions. Avoids complex AI/ML to ensure transparency

5) Admin Dashboard

Developed using React.js + Chart.js. Maintains user privacy.

Displays anonymous aggregated data:

- Average stress trends
- Sleep patterns
- Activity levels



B. System Workflow

The system workflow explains the step-by-step functioning of the application and how data flows through the system.

Step 1: User Authentication

User registers or logs in

Firebase Authentication ensures secure access

Step 2: Consent Collection

User provides permission for data collection

Ensures ethical and privacy-compliant usage

Step 3: Happiness Activities Selection

User selects 3–5 activities they enjoy

Used for personalization of suggestions

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Step 4: Weekly Mood Assessment
User answers simple questions using emojis/sliders
No scores are shown to avoid negative impact
Step 5: Lifestyle Data Collection
Data such as sleep, steps, and activity is recorded
Can be manual or via APIs (Google Fit)
Step 6: Data Storage
All user data is stored securely in Firestore
Step 7: Data Processing
Backend sends data to insight engine
Rule-based logic analyzes patterns
Step 8: Insight Generation
Personalized suggestions are generated
Focus on small, positive improvements
Step 9: Dashboard Display
Insights shown in simple format
Includes suggestions and trends
Step 10: Chatbot Interaction
User can interact with chatbot for motivation
NLP-based responses provided
Step 11: Admin Dashboard Update
Anonymous data aggregated
Used for institutional analysis



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VII. METHODOLOGY

A. *Overview*

The methodology of the proposed system focuses on developing a safe, non-diagnostic, and user-friendly mental well-being application. Instead of using complex AI models, the system follows a rule-based approach to generate insights based on user input such as mood, lifestyle habits, and personal activities.

The entire process is designed to ensure:

- User privacy and consent
- Simple interaction
- Personalized recommendations
- Ethical and safe usage

B. *Methodological Steps*

Step 1: Requirement Analysis

Identified issues faced by college students:

- Stress
- Poor sleep
- Low motivation

Studied existing apps and their limitations

Incorporated psychiatrist guidance:

- Avoid diagnosis
- Avoid video/audio analysis
- Focus on lifestyle and patterns

Step 2: Data Collection

Data is collected in a consent-based manner:

- Mood Data: Weekly questionnaire (10 questions)
- Lifestyle Data: Sleep, steps, water, exercise
- Happiness Activities: User-selected personal activities

Step 3: Mood Assessment

Users answer simple questions using:

- Emojis
- Sliders

No score is displayed

Mood is internally categorized as:

- Low
- Moderate
- Good

Step 4: Data Storage

All data is stored in Firebase Firestore

Includes:

- User details
- Mood history
- Lifestyle records
- Activity preferences

Step 5: Data Processing

Data is sent to backend APIs. Cleaned and prepared for analysis. Sent to the InsightEngine

Step 6: Insight Generation (Core Step)

Uses rule-based logic instead of machine learning

Examples:

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- Low sleep → Suggest better sleep habits
- Low activity → Recommend short walk
- Low engagement → Suggest favorite activities

Step 7: Chatbot Interaction

Uses basic NLP (NLTK/SpaCy). Detects keywords and sentiment

Provides:

- Motivational messages
- Supportive suggestions

Step 8: Result Display

Insights shown on dashboard. Simple and positive feedback. No negative scoring or judgment

Step 9: Admin Analysis

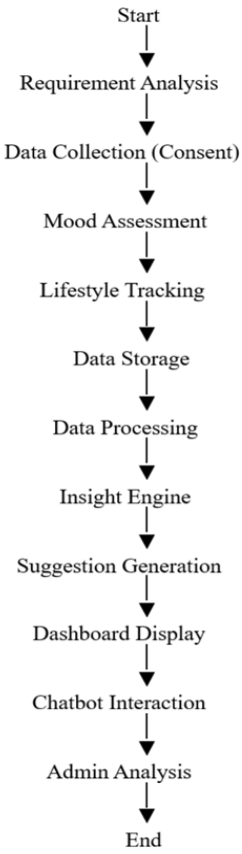
Aggregated anonymous data. Helps colleges understand trends. Ensures no personal data exposure

C. Key Features of Methodology

- Rule-Based Approach: Safe and explainable
- Non-Diagnostic Design: No medical claims
- User-Centric Input: Simple UI (emoji, sliders)
- Privacy Focused: Consent + anonymous data
- Personalization: Based on user activities

Step	Input	Process	Output
Requirement Analysis	Student issues	Study & expert guidance	System design goals
Data Collection	User inputs	Consent-based collection	Raw data
Mood Assessment	Questionnaire	Categorization	Mood level
Lifestyle Tracking	Sleep, steps	Monitoring	Lifestyle data
Data Processing	Stored data	Backend processing	Structured data
Insight Engine	Mood + habits	Rule-based logic	Suggestions
Chatbot	User text	NLP processing	Motivational response
Dashboard	Insights	Visualization	User-friendly display

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VIII. RESULTS AND DISCUSSIONS

The proposed system was designed to provide a simple, safe, and personalized mental well-being solution for college students. After implementation, the system was evaluated based on usability, effectiveness of suggestions, and overall user experience.

The results show that the application successfully integrates mood tracking, lifestyle monitoring, and personalized insights while maintaining a non-diagnostic and user-friendly approach.

A. Key Results

1) User Interaction and Usability

Users were able to easily navigate the app due to:

- Simple UI (emojis, sliders, buttons)
- Minimal typing requirement

Weekly mood check-ins were completed consistently. Users found the system easy and comfortable to use

2) Mood and Lifestyle Tracking

The system successfully collected:

- Weekly mood data
- Lifestyle habits (sleep, activity, etc.)

Helped users identify patterns in their daily routine

3) Effectiveness of Insight Engine

The rule-based recommendation system generated:

- Simple and actionable suggestions
- Non-judgmental feedback

Users responded positively to:

- Personalized suggestions
- Encouraging messages

4) Chatbot Performance

Chatbot provided:

- Basic emotional support
- Motivational responses

NLP-based keyword detection worked effectively for simple interactions

5) Privacy and Safety

No sensitive data misuse observed

Users felt more comfortable due to:

- No diagnosis
- No scoring system
- Anonymous data handling

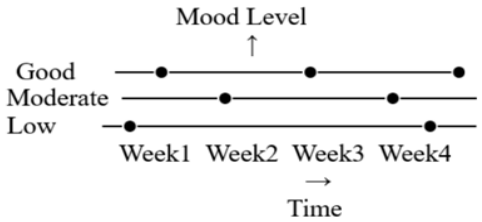
B. Result Analysis Table

Parameter	Observation	Outcome
Usability	Simple UI	High user engagement
Mood Tracking	Weekly check-ins	Consistent usage
Lifestyle Monitoring	Sleep, steps tracked	Better awareness
Insight Engine	Rule-based suggestions	Useful & safe feedback
Chatbot	Basic NLP	Supportive interaction
Privacy	Consent-based system	High trust level

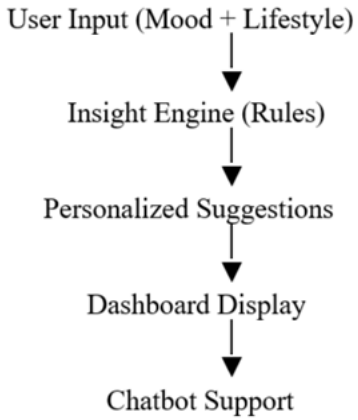
C. Sample Insight Output Table

User Condition	System Suggestion
Low Sleep	"Try sleeping 30 minutes earlier tonight."
Low Activity	"A short 10-minute walk can boost your energy."
Low Mood	"Try engaging in activities you enjoy."
No Happiness Activity	"Reconnect with something that makes you happy."

D. Mood Trend Representation Chart



E. System Output Flow



IX. TECHNICAL REVIEW

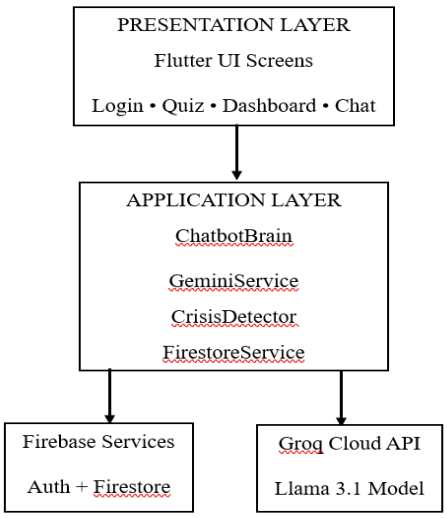
The proposed system, MindMate, is an AI-powered personalized mental well-being application developed using Flutter and Firebase technologies. The application is designed to support college students by providing mood tracking, wellbeing assessment, AI-based chat support, and personalized insights in a safe and non-diagnostic manner.

The technical implementation of the system follows a modular and scalable architecture where all functionalities are divided into separate service layers for bettermaintainability and performance. Unlike traditional applications that depend on dedicated backend servers, MindMate uses Dart service files inside the Flutter application as its backend logic, directly communicating with Firebase and Groq Cloud API.

The system is divided into the following major technical layers:

- Presentation Layer (Flutter UI)
- Application Layer (Dart Services)
- Cloud Services Layer (Firebase & Groq API)

A. Technical Architecture Diagram



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B. *Frontend Implementation*

The frontend is developed using Flutter, allowing cross-platform support for Android and Web applications using a single codebase.

1) *Frontend Features*

- Login and Signup
- Consent Collection
- Weekly Wellbeing Quiz
- Dashboard with Insights
- AI Chat Interface
- Profile and Reminder System

2) *Technical Advantages*

- Single codebase reduces development effort
- Fast rendering with Flutter widgets
- Reactive UI updates using Provider state management

3) *Backend Logic and Service Layer*

Instead of using a traditional backend server, the system uses Dart service files as the backend layer.
This modular design improves:

- Maintainability
- Scalability
- Code reusability

Major Service Files

Service File	Functionality
constants.dart	Stores system prompts, keywords, helpline
crisis_detector.dart	Detects crisis-related messages
gemini_service.dart	Handles AI communication
chatbot_brain.dart	Coordinates complete chat workflow
firestore_service.dart	Handles database operations
message_model.dart	Defines message structure

C. *AI Chatbot System*

The chatbot system uses:

- Llama 3.1 8B Instant Model
- Hosted on Groq Cloud API
- The chatbot provides:
- Personalized responses
- Emotional support
- Motivational interaction

1) *AI Workflow*

- User sends message
- CrisisDetector scans message
- Safe messages sent to Groq API
- AI generates response
- Response shown in chat UI
- Messages stored in Firestore

2) AI Chat Flow Diagram



D. Crisis Detection System

One of the most important technical features is the rule-based crisis detection system.

1) Working

- Every message is scanned before AI processing
- Uses keyword matching
- Severity Levels:
  - Level 0 → Safe
  - Level 1 → Mild concern
  - Level 2 → High-risk crisis

2) Technical Benefits

- Instant response
- No dependency on AI model
- Faster and safer crisis handling

3) Crisis Detection Table

Severity Level	Condition	System Action
Level 0	Normal message	Sent to AI
Level 1	Mild concern	AI response + helpline
Level 2	Crisis keywords	Immediate crisis message

E. Database and Data Management

The system uses Firebase Firestore as a cloud-based NoSQL database.

1) Stored Data

- User profile
- Quiz history

- Mood records
- Chat history
- Happiness activities
- Streak information

2) Authentication

Firebase Authentication provides:

- Secure login/signup
- Unique user identification
- Session management

F. Personalization Mechanism

The application personalizes AI responses by injecting user profile data into the AI system prompt.

Personalized Data Includes

- Quiz score
- Mood level
- Happiness activities
- User preferences

This allows the chatbot to generate:

- More relevant suggestions
- Context-aware responses
- Better emotional support

G. Technical Workflow

Complete System Workflow



H. Technology Stack

Layer	Technology Used
Frontend	Flutter
Programming Language	Dart
State Management	Provider
Database	Firebase Firestore
Authentication	Firebase Auth
AI Model	Llama 3.1 8B
AI Provider	Groq Cloud API
NLP	Keyword-based detection
Hosting	Firebase

X. CONCLUSION

This project presents a Personalized Mental Well-Being and Lifestyle Insight Application designed specifically for college students. The system focuses on providing a simple, safe, and non-diagnostic platform to help users understand their mood and daily habits without creating pressure or making medical judgments.

By integrating weekly mood assessment, lifestyle tracking, and personalized happiness activities, the application offers meaningful insights through a rule-based recommendation system. The inclusion of a chatbot further enhances user engagement byproviding motivational and supportive interactions.

Unlike many existing applications, this system avoids complex analytics and scoring, ensuring a positive and non-judgmental user experience. It also prioritizes user privacy and security by using consent-based data collection and anonymous data analysis for the admin dashboard.

Overall, the project demonstrates that a user-friendly and ethically designed solution can effectively support student well-being. It provides a strong foundation for future enhancements while maintaining a balance between technology, simplicity, and mental health safety

XI. FUTURE SCOPE

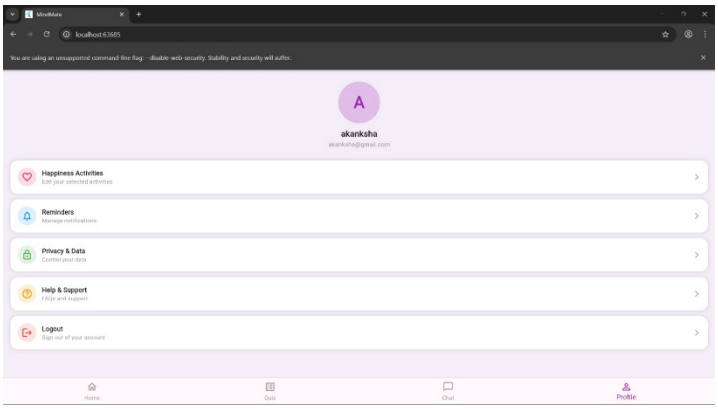
The system can be improved in the future to make it more useful and user-friendly. Some possible enhancements are:

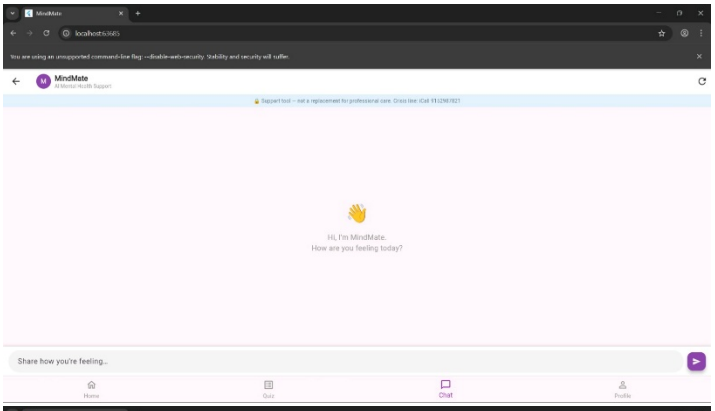
1) Adding AI-based suggestions for better personalization
2) Improving the chatbot for more natural conversation
3) Connecting with smart devices to track data automatically
4) Providing reminders for healthy habits like sleep and exercise
5) Supporting multiple languages for wider usability
6) Adding option to connect with professional help if needed

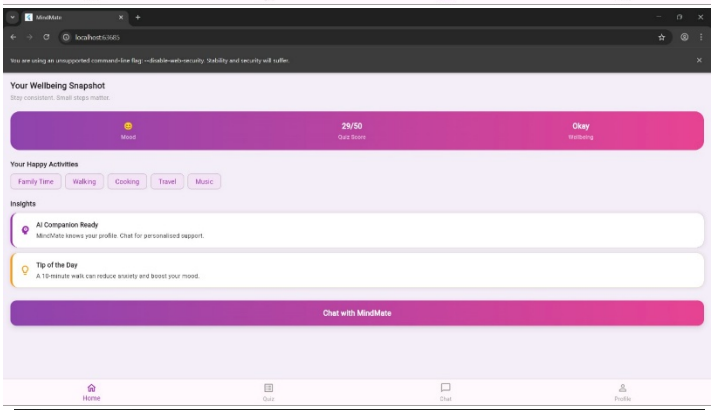
Overall, the future scope focuses on making the system more smart, simple, and helpful for users.

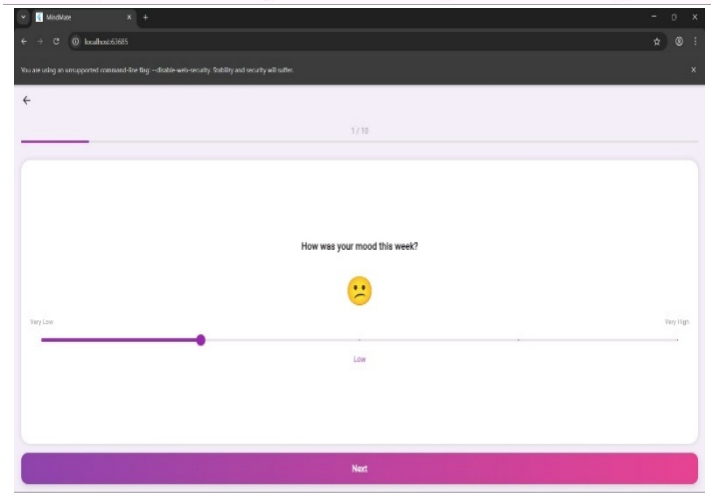
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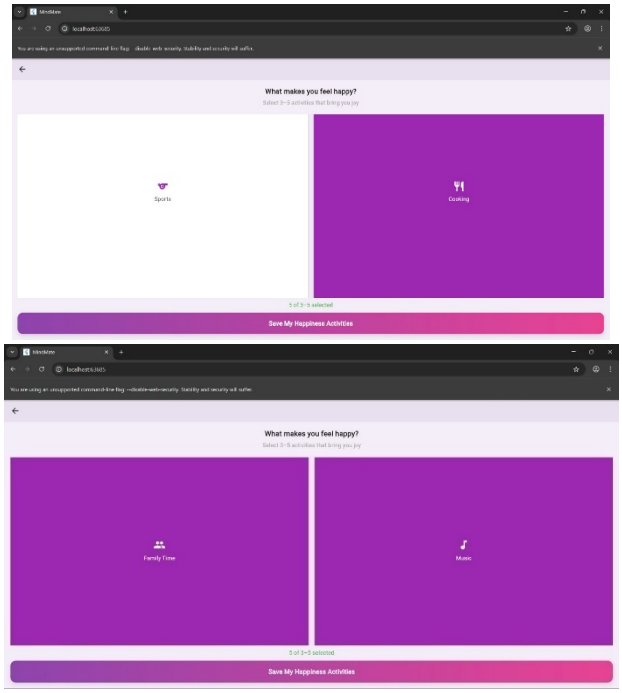
XII. OUTPUTS


akanksha
Happiness Activities
Reminders
Privacy & Data
Help & Support
Logout
Home
Quiz
Chat
Profile


MindMate
Hi, I'm MindMate.
How are you feeling today?
Share how you're feeling...

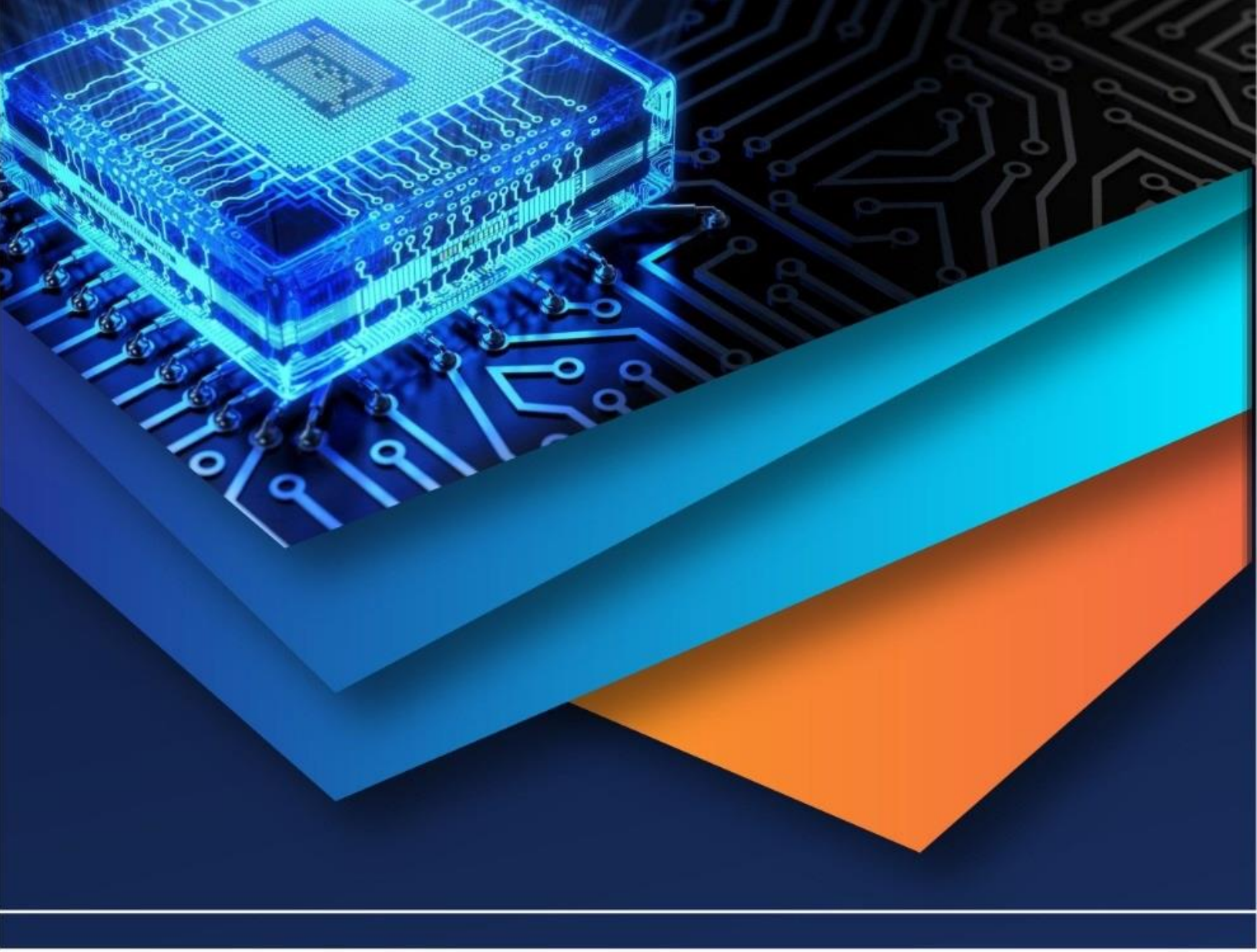

Your Wellbeing Snapshot
Mood
29/50
Quiz Score
Okay
Wellbeing
Your Happy Activities
Family Time
Walking
Cooking
Travel
Music
Insights
AI Companion Ready
Tip of the Day
Chat with MindMate
Home
Quiz
Chat
Profile


How was your mood this week?
Very Low
Very High
Low
Next



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