AI-POWERED MENTAL HEALTH ASSISTANT

PROJECT PROPOSAL

PROJECT OVERVIEW

The **Mental Health Assistant** is an AI-powered mobile application designed to help individuals with mild anxiety and depression track their mood, reflect on their feelings, and receive personalized feedback. The solution leverages simple **Natural Language Processing (NLP)** and **mood tracking** to provide users with daily insights, emotional support, and coping mechanisms based on their input, without requiring extensive external API integrations.

PROBLEM STATEMENT

Mental health issues, especially **mild anxiety** and **depression**, are widespread and affect millions globally. While clinical intervention is crucial, many individuals experience only mild symptoms and may not seek professional help or may struggle to maintain consistent support. Access to affordable, everyday tools for emotional self-care is essential, especially for those who may not require immediate therapy or medication but still need help managing their mental well-being.

OBJECTIVE

Develop a **Mental Health Assistant** app that empowers users to: (Impacts and Metrics

- Track their daily mood.
- Reflect on their feelings through journaling prompts.
- Receive personalized insights and coping tips.
- Encourage daily mindfulness and emotional regulation.

The solution will provide a **non-invasive**, **self-paced** tool that does not require complex integrations or sensitive data storage outside the user's device, prioritizing privacy and simplicity.

PROPOSED SOLUTION

The AI-powered **Mental Health Assistant** app is a mood tracker combined with journaling and personalized feedback. The application will use **natural language processing (NLP)** for analyzing journal entries and **basic machine learning models** to classify mood inputs and provide personalized responses. All functionalities will operate **locally** on the user's device to ensure privacy and minimal external dependencies.

KEY FEATURES

1. **Mood Tracking:**
    a. Users will select their mood each day from a list of predefined emotions (e.g., "anxious," "calm," "happy").
    b. The app will track mood over time, visualizing trends to help users spot emotional patterns.
2. **Journaling Prompts:**
    a. After logging their mood, the app will generate personalized journaling prompts based on the selected emotion (e.g., "What happened today that made you feel anxious?" or "What's something that made you feel calm today?").
    b. This provides users with an opportunity for self-reflection and cognitive restructuring.

3. **Text Analysis and Feedback:**
    a. When users submit journal entries, **NLP algorithms** will analyze the text for sentiment, emotion, and key themes (e.g., stress, fatigue, positivity).
    b. The system will offer feedback like, "You've mentioned feeling overwhelmed frequently. Consider trying relaxation techniques like deep breathing exercises."
4. **Personalized Insights:**
    a. Based on the ongoing data and analysis, the app will suggest coping strategies, mindfulness practices, and emotional wellness tips.
    b. The system will also provide gentle reminders, such as "It looks like you've been feeling anxious lately. Have you considered practicing mindfulness?"
5. **User-Friendly Interface:**
    a. The app will have a simple, intuitive interface, focusing on ease of use, with a focus on helping users develop emotional awareness and self-care practices.

TECHNICAL SPECIFICATIONS

1. Data Input Mechanism:

- Users will input their mood via a rating scale (e.g., 1 to 10 or predefined moods like "happy," "sad," "anxious").
- Users will write journal entries in response to daily prompts.

2. AI Processing Component:

- **Mood Classification:** Use a basic **classification model** (such as a pre-trained model on Teachable Machine or Hugging Face) to interpret user input and classify emotions (e.g., "happy," "anxious," "neutral").
- **Text Sentiment Analysis:** Use NLP to analyze journal entries for sentiment and key emotional themes (positive, negative, neutral).
- **Personalized Feedback:** Based on mood classification and sentiment analysis, provide personalized, context-sensitive feedback (e.g., tips for relaxation, cognitive reframing, etc.).

3. User Output Presentation:

- A **daily mood tracker** that visualizes emotional trends over time (graphs or charts).
- A **journal feedback page** that provides users with insights and coping strategies based on their journal entries.
- **Push notifications** for daily mood tracking reminders or mindfulness tips (using tools like **Firebase** for simple notifications).

4. Error Handling:

- Prompt users to input mood data if not entered.
- Handle incomplete or unclear journal responses with a message like, "It looks like your journal entry was empty. Feel free to share how you're feeling today."

TOOLS AND TECHNOLOGIES (WE ONLY CHOOSE ONE)

- **Teachable Machine:**

- Use this tool for creating a simple mood classification model based on user inputs, which runs locally on the device.

- **Hugging Face (for Sentiment Analysis):**
  - Pre-trained models will be used for text sentiment analysis to analyze journal entries for emotional content. This model will also run locally to minimize data exposure.
- **Bubble.io / Glide:**
  - These no-code platforms can be used to build the app interface, allowing for rapid development of mood tracking, journaling prompts, and feedback screens.
- **Local Storage:**
  - Store all data (mood logs and journal entries) securely on the user's device, ensuring privacy and control over personal data.

USER INTERACTION TOUCHPOINTS

1. **Mood Input Screen:**
   a. Users log their mood on a scale or choose from predefined emotions.
   b. After selecting their mood, users are prompted with a journaling question based on their selection (e.g., "What made you feel anxious today?").
2. **Feedback and Insights Screen:**
   a. Display trends of the user's mood over time in simple charts.
   b. Provide personalized insights based on journal entries, such as suggestions for coping techniques or mindfulness practices.

ETHICAL CONSIDERATIONS

1. **Potential Bias Sources in Training Data:**
   a. **Bias in Sentiment Analysis Models:** Ensure the sentiment analysis model accounts for diverse language styles and emotional expressions. The tool should be trained on diverse datasets to avoid misinterpretation of mood or emotions, particularly from underrepresented groups.
2. **Privacy Implications and Mitigations:**
   a. **Data Privacy:** No personal or sensitive data is transmitted off the device. Users' mood logs and journal entries are stored only locally, ensuring complete privacy.
   b. **Consent:** Provide users with clear consent forms explaining how their data will be used (with no data sharing) and allow them to delete their logs at any time.
3. **Accessibility Considerations:**
   a. **User Interface:** Design the app to be simple and accessible, with large text and high contrast for users with visual impairments.
   b. **Language Support:** Ensure the app's text is clear and simple, catering to users with varying levels of literacy and cognitive abilities.
4. **Environmental Impact:**
   a. **Minimal Energy Use:** Since the app operates locally without heavy cloud computing, it has a low environmental footprint compared to server-heavy applications.
5. **Unintended Consequences:**
   a. **Over-Reliance on the App:** The app should be designed to complement, not replace, professional mental health care. It should encourage users to seek professional help if their symptoms worsen.

RESEARCH: EXISTING AI APPLICATIONS IN MENTAL HEALTH

Several AI-powered tools are currently being used to address mental health challenges, particularly related to **anxiety** and **depression**. Here are three examples:

1. WYSA: AI-DRIVEN MENTAL HEALTH CHATBOT

Overview:

Wysa is an AI-powered mental health chatbot designed to help individuals manage symptoms of anxiety, depression, stress, and other mental health conditions. It combines **Cognitive Behavioral Therapy (CBT)** techniques, **Dialectical Behavioral Therapy (DBT)**, and **motivational interviewing** principles to provide users with personalized therapeutic conversations.

Key Features:

- **AI Chatbot** that provides immediate, interactive support.
- **Mood tracking** to monitor emotional fluctuations over time.
- **Therapeutic exercises** based on CBT and DBT techniques.
- **Privacy-focused**: Data remains secure, with no human therapists involved.

Learn More:

Wysa AI Chatbot

2. WOEBOT: A DIGITAL MENTAL HEALTH ASSISTANT

Overview:

Woebot is an AI-based conversational agent designed to provide emotional support and mental health assistance. Built on **Cognitive Behavioral Therapy (CBT)** principles, Woebot offers daily conversations with users, helping them manage their mental well-being through text-based interactions.

Key Features:

- **Conversational AI** that offers real-time emotional support.
- **Behavioral tracking** to monitor changes in mood and suggest interventions.
- **Evidence-based therapeutic techniques** such as CBT, DBT, and mindfulness.
- **Available 24/7**, providing support at the user's convenience.

Learn More:

Woebot Health

3. TESS: AI-POWERED PSYCHOLOGICAL SUPPORT TOOL

Overview:

Tess is an AI-powered **psychological support tool** that delivers personalized therapy in real-time via text messaging. Tess adapts its responses based on the user's mood, emotional state, and the psychological techniques required to improve their mental well-being.

Key Features:

- **Real-time psychological support** via text.
- **Customizable therapeutic interventions** using AI algorithms to adapt to the user's needs.
- **Continuous emotional tracking** and mood monitoring.
- **Support for both individuals and organizations**,

helping with mental health at scale.

Learn More: Tess by X2AI

CONCLUSION: WHY CHOOSE THIS SOLUTION

The **Mental Health Assistant** app offers a **privacy-first**, **efficient**, and **user-friendly** solution for managing mild anxiety and depression. By eliminating external API dependencies, we ensure that the app is:

- **Completely private and secure**, with no external data sharing.
- **Simple to develop and maintain**, resulting in faster deployment and lower operational costs.
- **Reliable and scalable**, without issues related to API failures, latency, or security risks.
- **Environmentally friendly**, with a smaller carbon footprint due to reduced server dependency.
- **Accessible**, allowing users to access their mental health support anytime, anywhere, even without an internet connection.

🧪 HOW TO REPRESENT TEACHABLE MACHINE FUNCTIONALITY IN FIGMA

🎯 1. DECIDE WHAT YOU'RE SIMULATING

Choose the feature(s) you're mimicking from Teachable Machine:

- **Voice tone detection** (e.g., calm, stressed, sad)
- **Facial emotion detection** (e.g., smiling, frowning)

🧱 2. CREATE STATES IN FIGMA

For each emotion or gesture class, design separate **UI states**:

State	Visual Element	Example
Calm	Soft colors, calm message	"You sound calm today. How can I assist you?"
Stressed	Red/orange hues, supportive message	"You sound stressed. Would you like to try a breathing exercise?"
Sad	Blue tones, empathetic message	"I'm here for you. Want to talk about it?"

3. USE COMPONENTS AND VARIANTS

Figma's **Variants** feature (in Component Sets) allows you to create one main component (e.g., "Emotion Response") with multiple versions (e.g., Calm, Stressed, Sad).

- Create a component for your assistant response UI.
- Add variants for each detection outcome.
- Name each variant based on the emotion/gesture detected.

4. ADD INTERACTIONS TO SIMULATE AI BEHAVIOR

Use **Prototype Mode** to simulate Teachable Machine detection:

1. Create a button or toggle labeled "Simulate Camera Input" or "Test Voice Input".
2. Link this to different variants based on which "emotion" the user chooses to simulate.
3. Use overlays or transition animations to simulate real-time detection changes.

EXAMPLE FLOW

1. **User clicks "Enable Camera"** (simulated).
2. **Assistant UI changes to "Analyzing..."** screen.
3. After delay (or button click), switch to a new screen:
    a. "You seem calm. Let's continue with today's wellness check-in."

OPTIONAL: ADD MICRO-INTERACTIONS

Use tools like:

- **Smart Animate** for smooth transitions between emotional states.
- **Lottie animations** (embedded via Figma plugins or Protopie) to simulate face scanning or microphone listening.