Warmup Exercise: AI-Powered Mental Health Assistant (MVP)

Problem Statement:

Mental health issues are becoming increasingly prevalent, and access to professional help is often constrained by time, resources, and stigma. The aim of this MVP (Minimum Viable Product) is to build an AI-powered mental health assistant that provides users with initial mental health assessments, personalized self-care recommendations, and the ability to identify early signs of emotional distress. This system will use AI-powered Natural Language Processing (NLP) to engage users, analyze text-based interactions, and offer sentiment detection.

Objectives:

- **Chat-based Mental Health Assessment**: Use NLP chatbots to conduct a preliminary assessment of a user's mental health state by evaluating the conversation.
- **Personalized Self-care Suggestions**: Based on user input, the assistant should offer recommendations that promote mental well-being, such as mindfulness exercises, relaxation techniques, or guided journaling.
- **Sentiment and Emotional State Analysis**: The assistant will analyze the user's emotions and sentiment through their text-based interactions.
- **Privacy and Anonymity**: The system must respect user privacy and provide anonymized interactions, ensuring that sensitive data is not exposed.
- **Professional Help Referral**: If needed, the assistant should offer suggestions or links to professional mental health resources or helplines (e.g., WHO, local mental health organizations).

Optional Bonus Feature (Agentic Enhancement):

- Develop an adaptive AI therapist that learns from ongoing interactions with users. Over time, it should improve its understanding and ability to offer more empathetic, context-aware advice.
- Implement multi-modal support, combining text, voice, and possibly facial recognition for more accurate emotional state assessments.

Timeline and Milestones for MVP Development:

1. Week 1 – Initial Setup & Research

- **Objective**: Familiarize the team with the tools and APIs to be used, including Google Dialogflow, IBM Watson Tone Analyzer, and Twilio API.
- **Actions**:
    - Research best practices for NLP and sentiment analysis.
    - Study existing mental health apps or tools for inspiration.
    - Define the key use cases for the MVP (e.g., mood tracking, emotional support).

2. Week 2 – NLP & Sentiment Analysis Integration

- **Objective**: Set up the chat-based assessment system and integrate sentiment analysis.
- **Actions**:
    - Implement Google Dialogflow for conversational AI.
    - Integrate IBM Watson Tone Analyzer to evaluate the user's emotional state through text input.
    - Test and refine conversational flow based on sample input.

3. Week 3 – Self-care Recommendations & Resource Integration

- **Objective**: Develop and integrate personalized self-care recommendations based on user input.
- **Actions**:
    - Create a library of self-care tips (e.g., mindfulness exercises, breathing techniques).
    - Integrate the WHO Mental Health API to provide verified mental health resources and helplines.
    - Develop a simple interface that presents recommendations to users.

4. Week 4 – Privacy, Anonymity, and Testing

- **Objective**: Ensure that user data is handled securely and anonymized.
- **Actions**:
    - Implement data encryption and anonymization for user interactions.
    - Conduct basic usability testing (e.g., user feedback on ease of use and experience).
    - Refine the flow based on user feedback.

5. Week 5 – Demo Preparation & Final Review

- **Objective**: Finalize the MVP, prepare demo video and documentation.
- **Actions**:
    - Host the code on GitHub with clear instructions for setup.
    - Create a 3-5 minute demo video showcasing the functionality of the system.
    - Document API integrations clearly for submission.

6. Week 6 – Submission

- **Objective**: Submit the MVP along with required documentation and presentation slides.
- **Actions**:
    - Submit the GitHub repository link, demo video, and API documentation.
    - Prepare a slide deck explaining the key features of the MVP, user experience, and future plans.

Key Features to Focus On:

- **NLP-Based Chatbot**: For engaging users and performing initial assessments.
- **Sentiment/Emotion Recognition**: Integrate basic sentiment analysis to assess user moods.
- **Self-care Suggestions**: Provide automated responses that guide users towards better mental well-being.
- **Integration with Mental Health Resources**: Offer real-time access to helplines or other resources when necessary.

Evaluation Criteria:

- **Accuracy of NLP Responses**: Does the system correctly understand user queries and provide meaningful responses?
- **Effectiveness of Sentiment Analysis**: How accurately does the system detect emotions and respond accordingly?
- **User Experience**: How user-friendly and intuitive is the interface? Does the system feel empathetic and supportive?
- **Scalability**: Can the system handle an increased number of users and additional features over time?
- **Privacy Compliance**: How well does the system ensure user privacy and data protection?

Deadline: 19th April 2025