Info 7375 - PROMPT ENGINEERING

Mental Health Assistant

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Overview of Features, Technology, and Psychological Basis

Introduction

This project presents a comprehensive Mental Health Assistant that combines LLMs, emotion detection, and privacy-first technology to support users with mood tracking, therapeutic tools, and empathetic AI responses.

Features

- **Daily Mood Journaling**
  Users can write or speak about their feelings daily. Supports both text and voice input.

- **Emotion Detection**
  Automatically labels journal entries with emotions like joy, sadness, or anxiety using a pre-trained model.

- **Empathetic AI Chatbot**
  Provides emotionally supportive conversations. Helps reframe negative thoughts with kindness and guidance.

- **Voice Support**
  Allows users to input and receive responses through voice, making the app more accessible.

- **Weekly Mental Health Summary**
  Summarizes mood and emotional trends using charts and natural language summaries.

- **Self-Help Toolkit**
  Offers breathing exercises, affirmations, and CBT-style practices guided by the AI.

Tech Stack

- **Backend & Core**
  - o **Python** - Main programming language
  - o **FastAPI** - High-performance web framework for APIs
  - o **LangChain** - LLM orchestration and prompt engineering
  - o **SQLite** - Local database storage
- **AI Models & Processing**
  - o **GPT-3.5** (OpenRouter) / **Mistral-7B** - Conversational AI
  - o **Ollama** - Local LLM deployment for privacy mode
  - o **cardiffnlp/twitter-roberta-emotion** (HuggingFace) - Emotion detection
  - o **Whisper** - Speech-to-text conversion
- **Voice & Audio**
  - o **gTTS / pyttsx3** - Text-to-speech synthesis
  - o **Whisper** - Voice input processing
- **Data Visualization**
  - o **Matplotlib** - Charts and emotional trend visualization
- **Frontend & Deployment**
  - o **Streamlit** - Web interface (desktop)
  - o **Flutter** - Mobile app (optional)
  - o **JSON** - Data serialization and configuration

Daily Mood Journaling

- Users write about their day or feelings using text or voice input.

- Uses Python backend, SQLite/JSON for storage, and Whisper for voice-to-text.

- Based on CBT principles like self-monitoring and thought awareness.

Emotion Detection

- • Automatically labels journal entries with emotions like joy, sadness, and anxiety.

- • Uses HuggingFace's `cardiffnlp/twitter-roberta-emotion` model.

- • Grounded in CBT (emotional labeling) and ACT (acceptance-based therapy).

Empathetic AI Chatbot

- Responds with kindness, reframes negative thoughts using LLMs.

- Powered by GPT-3.5 or Mistral-7B via LangChain and prompt engineering.

- Uses CBT (cognitive restructuring) and supportive therapy techniques.

Conclusion

- This Mental Health Assistant blends AI, psychology, and user-first design to offer:
- Emotionally intelligent support
- Personalized self-help tools
- Full privacy with offline-first mode

- Ideal for improving emotional well-being in a private and meaningful way.