🌿 Conversational Agent for Mental Health Support

📖 Description

A conversational AI designed to **detect signs of stress, anxiety, or depression** and provide **empathetic, context-aware, and non-clinical responses** using Natural Language Processing (NLP).

The chatbot goes beyond simple text parsing by integrating **emotional intelligence, safety mechanisms, and long-term emotional tracking**, ensuring privacy and meaningful interactions.

⚡ Key Challenges

- Detecting **emotional tone**, not just text meaning.
- Combining **sentiment + emotion + intent classification**.
- Avoiding **medical advice** while ensuring **safety filters** for high-risk cases.

🌟 Core Vision

Build an **emotionally intelligent, privacy-preserving, context-aware chatbot** that supports users through difficult emotional states, provides coping suggestions, and tracks emotional well-being over time.

🚀 Advanced Features

1. 🧠 Emotion Trajectory Detection

- **Purpose:** Track emotional tone across sessions to detect improvement or deterioration.
- **Model:** Transformer-based classifier (RoBERTa, DistilBERT, BERTweet).
- **Input:** Past conversation logs.
- **Output:** Emotional timeline & trends.
- 📊 *Bonus:* Visual dashboard (line chart showing emotions like *anxiety*, *calm*, etc.).

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2. 🤝 Contextual Empathy Engine

- **Purpose:** Generate responses tailored to mood & context.
- **Approach:**
    - Sequence-to-sequence models (DialoGPT, BlenderBot).
    - Emotion embeddings + EmpatheticDialogues dataset.
    - Persona conditioning (basic user memory: age, preferences).

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3. 🌱 Dynamic Coping Suggestions

- **Purpose:** Offer adaptive coping techniques (e.g., journaling, guided breathing, gratitude exercises).
- **Approach:**
    - NLP keyword mapping to stressors.
    - Knowledge graphs (ConceptNet) for contextual recommendations.

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4. 🔒 Privacy & Safety Layer

- **Purpose:** Detect high-risk inputs (suicidal ideation, self-harm).
- **Approach:**
    - SuicideRiskClassifier fine-tuned on Reddit SuicideWatch.
    - Privacy compliance via anonymization layers.
    - Emergency support triggers (e.g., "Would you like to talk to a counselor?" + helpline info).

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5. 🧾 Mini Journal Integration

- **Purpose:** Provide users a safe space to "vent" and reflect.
- **Approach:**
    - Summarization with PEGASUS/BART.
    - Sentiment tagging + emotion labeling.
    - *Bonus:* Mood prediction from journal entries.

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6. 🗣️ Speech-to-Text + Voice Response

- **Purpose:** Enable voice-based empathetic conversations.
- **Tools:**
    - Whisper for voice-to-text.
    - Tacotron (TTS) for empathetic voice replies.
- **Challenge:** Preserving tone & warmth in spoken responses.

🛠️ Tech Stack Suggestions

Feature	Suggested Tools/Models
Emotion Detection	RoBERTa, GoEmotions dataset
Dialogue System	DialoGPT, BlenderBot, Rasa
Response Generation	GPT-3.5 fine-tuned on EmpatheticDialogues
Suicide Detection	Reddit SuicideWatch + BERT Classifier
Summarization	BART, PEGASUS
Voice Integration	Whisper + Tacotron
Dashboard	Streamlit / Flask + Plotly / D3.js

📚 Datasets to Explore

- **EmpatheticDialogues**
- **GoEmotions**
- **CLPsych 2022 Shared Task Data**
- **Reddit Mental Health Corpus**

🎓 Research Angle

"A multi-session, context-aware conversational agent for early detection and management of emotional distress in youth populations."