Gen AI Exchange Hackathon

Team Name : GenAURA++

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Problem Statement : **Generative AI for Youth Mental Wellness**

Design an AI-powered, confidential, and empathetic mental wellness solution that supports and guides youth in overcoming stigma and accessing help.

- HealAura (By GenAURA++) is an AI-powered mental wellness companion designed to support youth through daily conversations and a wellness dashboard for tracking well-being.

- Therapy Session combines **empathy, Cognitive Behavioural Therapy (CBT), metacognition (awareness of thoughts), and emotional context detection** to provide **personalized, therapeutic-like support** in a confidential, stigma-free way.

- HealAura combines hourly logs and daily reflections on sleep, food, activities, and emotions. Its AI analyses both current and past data to uncover patterns, mood trends, and challenges, then provides personalized insights, visuals, and weekly goals to support healthier habits and long-term well-being.

HealAura

An empathetic, metacognitive, and CBT-inspired AI dedicated to nurturing your well-being and supporting you psychologically at every step
By GenAURA++

How our solution is different:

- **Confidential & Anonymous First:**
  No signup with email/phone, youth can share freely without stigma. Data stored securely, no personal identity required.

- **Voice-First & Emotion-Aware Conversations:**
  Doesn't just listen to what you say, it analyses how you say it (tone, pitch, energy) and fuses this with text analysis for a richer, more accurate understanding of your emotional state than text-only apps.

- **Dual-Brain Architecture (Unique Decision System):**
  HealAura is different from typical chatbots through its Dual-Brain Therapeutic Engine, **Brain1** analyses recent interactions and the user's current response to decide the next best step, while **Brain2** translates that strategy into warm, natural language—blending empathy, CBT, and emotional insight for safe, personalized, stigma-free support.

- **Transparent Guidance:**
  Every AI suggestion explains the psychology behind it, empowers learning and self-awareness

- **Proactive & Guided Crisis Intervention:**
  Goes beyond flagging keywords. If a crisis is detected, it immediately provides resources (e.g., helpline) and then guides you through a guided exercise to regulate overwhelming emotions in real-time.

- **Wellness Tracker with AI-Powered Insights:**
  asks users to log hourly journals and lifestyle data, then transforms this into more than just visuals, it provides personalized narrative insights, weekly goals, correlation charts, and daily summaries(from logs and therapy sessions), along with simple notes that guide users on how to read and interpret their charts effectively.

How it solves the problem?

- Youth may hesitate to seek therapy due to stigma, cost, or availability. This solution provides a confidential, stigma-free, anonymous AI companion that is always available, a private space to speak freely without face-to-face anxiety, social pressure, or the need for personal credentials.

- Every interaction begins with an empathetic reflection that validates the user's feelings, building trust and rapport by making them feel truly heard and understood, AI that listens with empathy, without judgment.

- Unlike text-only apps, This solution uses multi-modal emotion detection by analyzing vocal tone, pitch, energy, and rhythm alongside text sentiment through LLMs, then fuses these signals to identify emotions

- Unlike generic AI tools, This solution's dual-brain system ensures clinically grounded, human-like support. Brain1 (Therapist Mind) analyzes emotion, history, and safety to decide the next best step, while Brain2 (Companion Voice) delivers warm, natural responses and explain why techniques work. This builds a genuine therapeutic alliance instead of a transactional chat.

- metacognition and CBT integration: It gently prompts users to reflect on their own thought patterns ("What part of today felt most overwhelming?") and challenges unhelpful thoughts ("Is there another way to look at this?"), equipping them with long-term psychological tools.

- Builds Long-Term Self-Awareness: Without reflection, it's hard for youth to see patterns in mood triggers. The Wellness Tracker aggregates daily logs, activities, and emotions into insights, visuals & weekly goals, helping users discover what improves or worsens their well-being.

USP of the proposed solution

- **Anonymous & Youth-Friendly:** no emails, no stigma, always available as a trusted companion.
- **Multi-Lingual Support:** Communicate naturally in multiple languages (currently English & Hindi)
- **Voice + Emotion Fusion:** Understands How You Feel, Not Just What You Say
- **Therapeutic Intelligence:** A unique blend of empathy, guided tasks, metacognition, and Cognitive Behavioural Therapy — delivered without scripted flows.
- **Transparent Support:** explains the psychology behind every step, empowering growth, not blind advice.
- **Beyond Conversation:** integrated wellness tracker with AI insights, correlations & personalized goals.
- **Proactive, Non-Blocking Crisis Intervention:** Upon detecting crisis language, it doesn't just display a hotline number and end the session.

List of features offered by the solution

Feature1 : The Real-Time Conversational Therapist

This feature is focused on providing immediate, in-the-moment support through voice conversations.

This feature includes:

- **Multi-Lingual Support:** Communicate naturally in multiple languages (currently English & Hindi) his feature includes
- **Multimodal Emotion Detection:**
  Vocal Tone Analysis: Analyzes the user's pitch, energy, and tempo to understand the emotion behind their words.
  Speech Content Analysis: Accurately transcribes the user's speech to understand the topics being discussed with emotion detection.
- **Adaptive AI Dialogue:** The AI's "Dual-Brain" system dynamically chooses the most effective therapeutic strategy based on the user's detected emotional state and past conversation. It Applies principles of Empathy, Cognitive Behavioural Therapy (CBT), and Metacognition in its responses.
- **In-the-Moment Guided Exercises:** When high stress or anxiety is detected, the AI can initiate and guide the user through short, actionable tasks like breathing exercises, grounding techniques, and other regulation tools.
- **Session Summaries:** At the end of each conversation, the AI generates a concise summary of the key topics and emotions discussed, which is then saved to the user's private Wellness Tracker.

Watch this short video for feature1 demo: https://drive.google.com/file/d/1a3dcRTOVvzfd-44exAwq15EljmViffu8/view?usp=drive_link

List of features offered by the solution
Feature2 : The Wellness Tracker
These features are focused on long-term reflection, pattern discovery, and personalized growth.
# This feature includes:

- **Daily Wellness Logging:**
  - **Structured Daily Reflections:** Users can log key factors like sleep quality, social interactions, activities, and food intake quality.
  - **Hourly Emotional Check-ins:** A simple interface allows users to log their thoughts and feelings at any hour of the day.

- **AI-Powered Personal Insights Dashboard:**
  - **Narrative Insights:** Gentle, text-based observations about positive patterns, potential challenges, and areas for growth.
  - **Actionable Suggestions:** A concrete, easy-to-do tip based on the user's data
  - **Personalized Weekly Goals:** A short list of achievable goals with rationales to help the user focus their efforts.

- **Comprehensive Data Visualizations:**
  - **Correlation Charts:** Visualizing the link between mood and factors like sleep, activities, and social time.
  - **Sentiment Over Time:** A line chart tracking the user's emotional journey.
  - **Emotion Distribution:** A pie chart showing the most frequently logged emotions.
  - **Calendar Heatmap:** An at-a-glance view of daily sentiment, with the ability to click any day for an AI-generated summary.
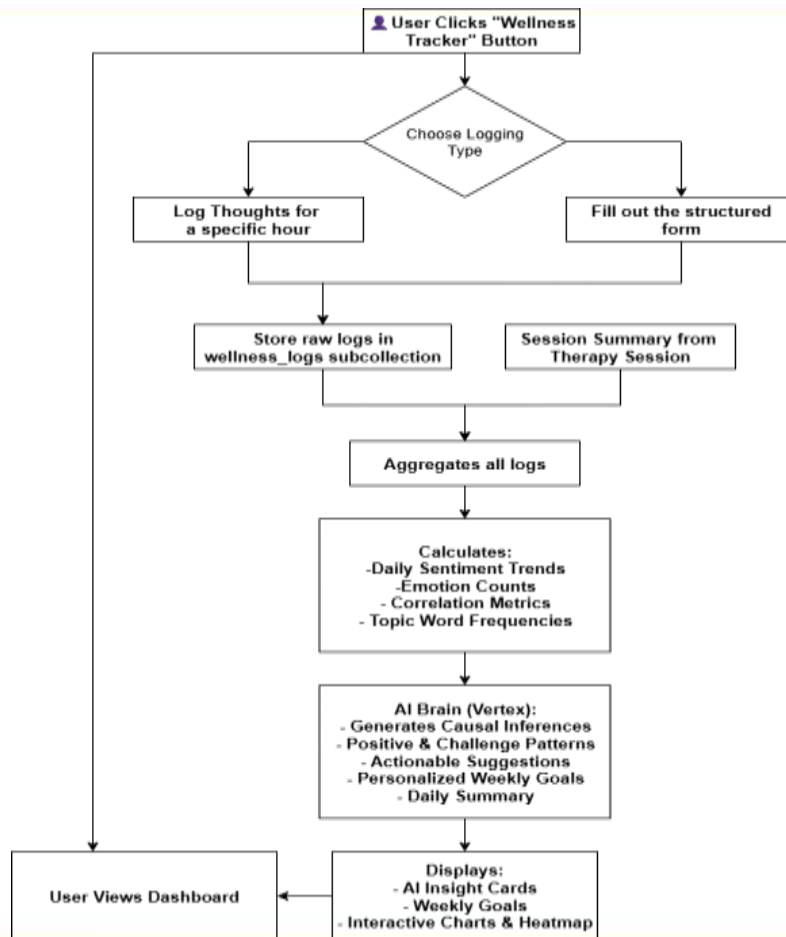
Watch this short video for feature2 demo: https://drive.google.com/file/d/18kYT3MaTz6DrYmp-evqjcPvlKyL4gC36/view?usp=drive_link
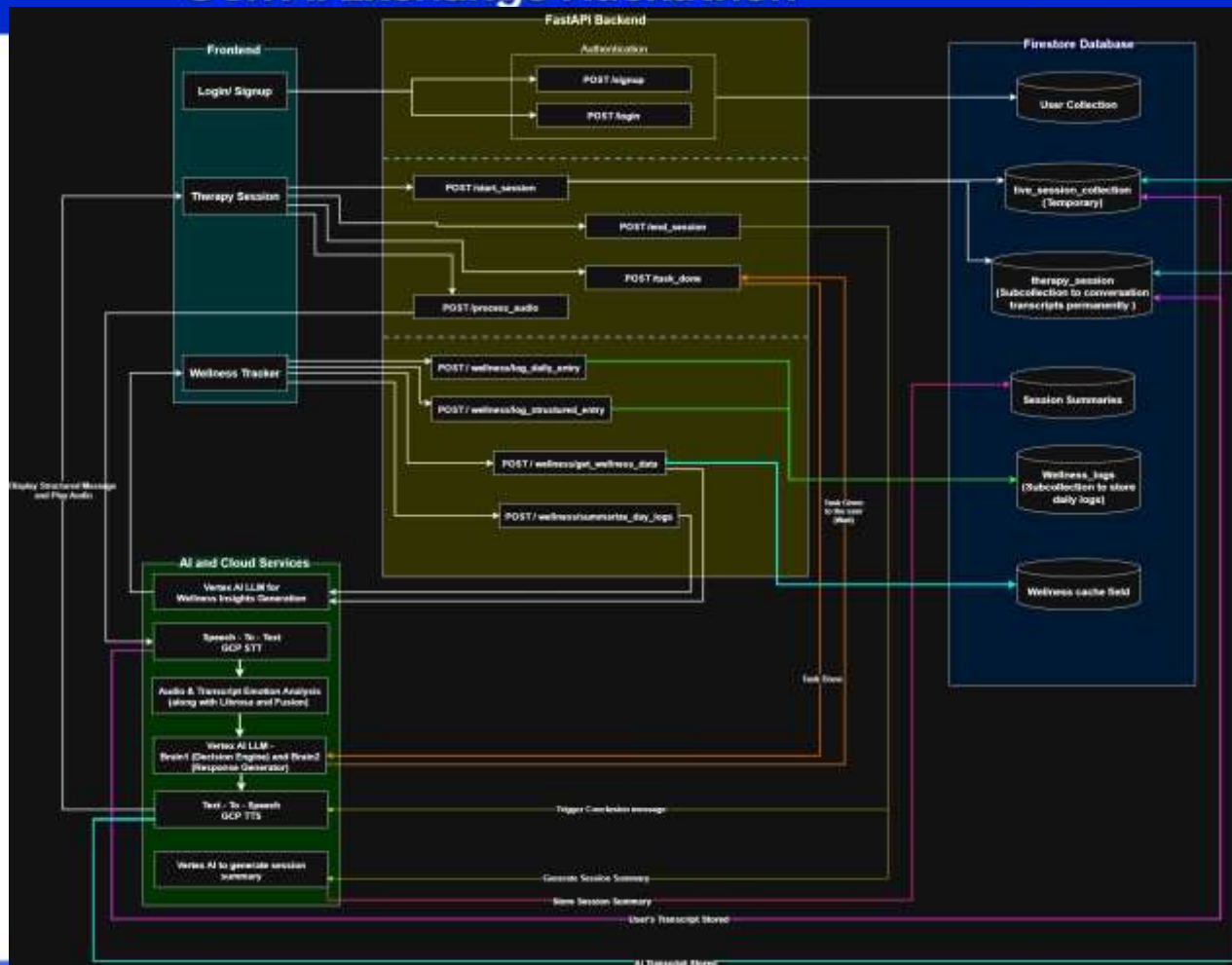
Process flow diagrams

Click Here

Process flow diagrams

Click Here

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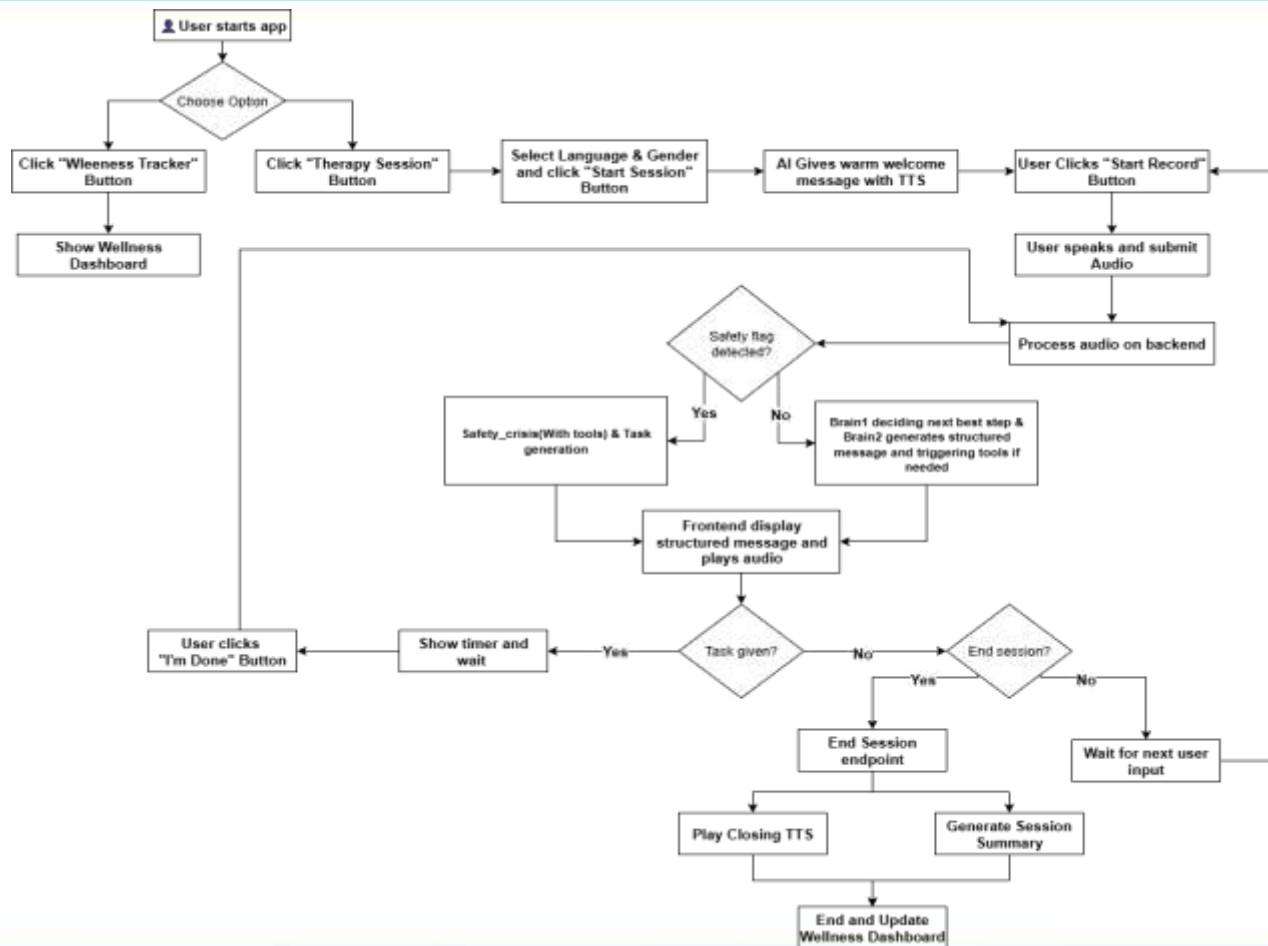
Architecture diagram of the proposed solution

[Click Here](#)

Technologies to be used in the solution:

Frontend Technologies:
- **HTML5:** The core markup language for structuring the web application.
- **CSS3:** Used for all styling, layout, and visual presentation (style.css).
- **JavaScript (ES6+):** The programming language for all client-side logic, interactivity, API communication, and dynamic UI rendering.
- **Chart.js & D3.js:** For charts, sentiment trends, correlations, and word cloud visualization.

Backend Technologies:
- **Python 3:** The core programming language for the server-side application.
- **FastAPI:** A high-performance web framework for building the REST APIs. It handles routing, request/response validation, and dependency injection.
- **Uvicorn:** An ASGI (Asynchronous Server Gateway Interface) server used to run the FastAPI application.

Audio Processing:
- **Ffmpeg:** Converts uploaded audio (e.g., webm/mp3) to 16kHz mono WAV for consistency.
- **librosa (Python):** Extracts speech/audio features (RMS (energy/loudness), Tempo (speed of speech), Pitch (fundamental frequency), Duration)
- **Fusion logic:** Combines audio features & transcript to improve emotion detection.

Database / Storage:
- **Google Cloud Firestore:** NoSQL database for storing all users, live_sessions, therapy_sessions, wellness_logs, session_summaries, wellness_cache.

External Services & APIs (Google Cloud Platform):
- **Vertex AI (Generative Models API):** The core AI service for generation tasks (Brain1, Brain2, wellness insights, summarization).
- **Cloud Speech-to-Text API:** The service used for converting user audio to text.
- **Cloud Text-to-Speech API:** The service used for converting the AI's text response into audible speech.

Development & Utility Tools:
- **Git & GitHub:** For version control and code repository management.
- **Docker:** For containerizing the application, ensuring consistent deployment across different environments.

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Thank you