

AI Mental Health Companion – Project Overview & Milestones

Project Overview

The **AI Mental Health Companion** is an empathetic chatbot designed to support mental well-being through journaling, mood tracking, and personalized habit suggestions. Using an advanced LLM (Gemini API), it engages users in natural, supportive conversations, analyzes emotional patterns from journaling entries, and provides tailored feedback to enhance self-awareness and emotional resilience.

Core Features:

- **Empathetic Chatbot:** Engages in supportive conversations with users.
- **Journaling Interface:** Allows users to record daily thoughts and feelings securely.
- **Mood Analysis:** Detects emotional patterns from past interactions.
- **Habit Suggestions:** Provides personalized recommendations to improve mental well-being.
- **Data Privacy:** Uses Firestore backend with secure session logging and user-level data separation.
- **Scalable Deployment:** Built for local and cloud deployment, supporting up to 10 concurrent users during testing.

Week 1: Foundation & Core Features

Milestone 1 – Project Setup & Architecture (Day 1-2)

- Finalize feature scope and prioritize MVP components.
- Set up GitHub repository and establish a clean project structure.
- Create a detailed system architecture diagram showing:
 - Chatbot flow (User → Streamlit UI → Gemini API → Firestore)
 - Data storage and privacy layers.
- Define security and privacy principles, ensuring HIPAA-like data handling practices.

Milestone 2 – Core Chatbot Integration (Day 3-4)

- Integrate Gemini API or alternative LLM for empathetic conversation.
- Implement prompt engineering techniques to maintain a supportive, non-judgmental tone.
- Develop a basic Streamlit UI with live chat functionality.
- Enable message history display for continuity during sessions.

Milestone 3 – Firestore Backend Setup (Day 5-6)

- Configure Firestore project with secure access rules and authentication.
 - Build data schemas for:
 - User profiles
 - Journaling entries
 - Mood analytics
 - Implement session logging with encryption for sensitive user data.
 - Validate backend operations with mock data.
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Week 2: Advanced Features & Testing

Milestone 4 – Mood Analysis & Feedback Engine (Day 7–8)

- Develop a sentiment analysis pipeline using Gemini or a lightweight NLP model.
- Extract emotional patterns and track them over multiple sessions.
- Generate personalized feedback and habit suggestions tailored to user mood.
- Store analyzed mood metrics in Firestore for historical visualization.

Milestone 5 – Enhanced UI & Experience (Day 9–10)

- Add a journaling interface with:
- Mood selection widgets (e.g., emojis or sliders)
- Session history and progress visualization.
- Implement habit suggestion display (carousel or card-based UI).
- Improve chatbot responses to reference past journaling and feedback.
- Refine frontend for mobile and multi-device accessibility.

Milestone 6 – Testing & Iteration (Day 11–12)

- Write unit tests for backend services and chatbot flows.
 - Conduct functional tests for journaling, mood analysis, and feedback generation.
 - Simulate multi-user sessions to ensure isolated data handling.
 - Gather early feedback from 3–5 test users.
 - Iterate on UX and chatbot prompts based on feedback.
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Week 3: Deployment & Wrap-Up

Milestone 7 – Scalability & Deployment (Day 13–14)

- Containerize the application using Docker.
- Prepare GCP deployment via App Engine or Cloud Run.
- Implement environment variables for keys and runtime configs.
- Perform small-scale load testing with 5–10 concurrent users.
- Verify backend scaling and chatbot response stability.

Milestone 8 – Final Polishing & Documentation (Day 15–17)

- Optimize chatbot empathy responses and reduce API latency.
- Enhance UI aesthetics and overall usability.
- Write comprehensive documentation including:
- Architecture overview
- Setup instructions
- API usage guide
- Data privacy and security notes
- Record a demo video showcasing:
- Chatbot empathy

- Journaling and mood analysis features
 - Habit suggestion generation.
 - Prepare for MVP release.
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Deliverables by End of Week 3

- Fully functional web application with:
- Empathetic chatbot
- Journaling interface
- Mood analytics and habit suggestions
- Secure Firestore-backed session storage with privacy safeguards.
- GCP-ready, scalable deployment.
- Detailed documentation and demo video for stakeholders.