**Multi-Agentic Health Assistant**

**Design Document**

**Introduction** This document outlines the step-by-step design and architecture of a multi-agentic model designed to support an individual's physical and mental well-being through personalized diet, exercise, and mental health management.

The system uses multiple LLMs and vision models and provides a unified interface through a Web-based frontend.

**Step 1: User Profile Initialization** User inputs collected at launch:

* Name / Age / Gender
* Height / Weight
* Fitness goal (e.g., weight loss, muscle gain)
* Activity level (sedentary, lightly active, active, very active)
* Dietary preferences (vegan, vegetarian, keto, allergies, etc.)
* Mental health background (optional)
* Daily schedule / Time availability
* Medical conditions (if any)

**Step 2: System Architecture Overview**

Three LLM agents:

**Agents:**

1. Mental Health LLM Agent (Knowledgebase)
2. Diet LLM Agent (with vision model) (Database)
3. Exercise LLM Agent (Database)

**Databases:**

* SQLite/Postgre
* SQL DB

Mental Health LLM Agent

**Functions:**

* Daily check-ins and emotional support
* Guided journaling and motivational prompts
* Memory mode to store flagged conversations

**Features:**

* Sentiment analysis and emotion classification
* Secure memory log for past conversations
* Stores summaries with tags and timestamps
* Enables recall of important past discussions (Flagged by the user through the toggle)

Diet LLM Agent

**Functions:**

* Meal planning and nutritional suggestions
* Vision-based analysis of consumed meals (Vision LLM)

**Features:**

* Vision model integration to analyze meal photos
* Nutrient breakdown and diet goal comparison

Exercise LLM Agent

**Functions:**

* Generate personalized routines
* Track workout completion and calories burned (Store in the database)

**Features:**

* Adjusts difficulty and goals weekly
* Logs performance data

**Extra Feature: Streamlit/Web Frontend (Full Vibe-coding)**

**Tabs:**

* Dashboard
* Mental Health (chat with memory toggle)
* Diet Tracker (upload images, view breakdown, both image and text)
* Exercise Plan (view and log workouts)

**Extra feature (Recommended): Token and History Management**

* Rolling window for each LLM to manage context
* Summarization of older messages
* Long-term memory only for mental health agent

**Extra feature (Optional): Audio Messages**

* User should be able to communicate with LLMs with Audio
* Transcribed text should appear in frontend as user message

**API keys and Tech stack**

For API key, login to: <https://www.together.ai/>

Make an account. It grants you $1 in credits that should be enough for the project.

**Models to use:**

Text Model: LLaMA 3.1 8b

Vision Model: LLaMA 3.2 11b Vision

Embedding: Use any available in Together.ai

**Requirements & Blueprint**

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