Hackathon Project Phases for the **Advancing Nutrition Science through GeminiAI** project.

Hackathon Project Phases

Project Title:

Advancing Nutrition Science through GeminiAI

Team Name:

Nutriverse AI

Team Members:

- Chinnala Nithish Yadav
- Alumula Sai Adarsh
- Bai Kountheya
- Bhukya Sunil

Phase-1: Brainstorming & Ideation

Objective:

GeminiAI harnesses the power of advanced machine learning and data analytics to innovate and drive breakthroughs in nutrition science. By offering personalized dietary insights and optimizing nutritional interventions, it aims to improve global health outcomes. Through collaborative research and cutting-edge technology, GeminiAI advances our understanding of nutrition's impact on health.

1. **Problem Statement:**

   GeminiAI leverages artificial intelligence to offer detailed nutritional insights and personalized dietary recommendations. Projects like "Nutrition Science through Gemini AI" and "AI-Nutrition-Advisor" analyze food images and provide health data to help individuals and professionals make informed dietary choices. The combination of

technology and nutrition science holds great potential for improving health outcomes.

2. **Proposed Solution :**
   A proposed solution is to leverage GeminiAI's advanced capabilities to create a comprehensive database of food items with detailed nutritional information. This AI can then provide personalized dietary recommendations by analyzing user-provided food images and health data. By integrating these features into a user-friendly app, we can enhance dietary decision-making and promote better health outcomes

3. **Target Users:**
   The targeted users for GeminiAI's nutrition solution include health-conscious individuals seeking personalized dietary advice and nutritionists looking for accurate nutritional data to support their clients. Additionally, fitness enthusiasts and healthcare professionals can benefit from the detailed food analysis and health insights provided by the AI.
4. **Expected Outcome**:
   The targeted users for GeminiAI's nutrition solution include health-conscious individuals seeking personalized dietary advice and nutritionists looking for accurate nutritional data to support their clients. Additionally, fitness enthusiasts and healthcare professionals can benefit from the detailed food analysis and health insights provided by the AI.

Phase-2: Requirement Analysis

Objective:

Define the technical and functional requirements for the **Advancing Nutrition Science through GeminiAI** Web App.

Key Points:

1. **Technical Requirements:**

   - Programming Language: **Python,HTML,JavaScript**
   - Backend: **Python,Gemini AI**
   - Frontend: **HTML,CSS,JavaScript**

   The key functional requirements for GeminiAI's nutrition solution include user registration with profile management, a detailed food database for nutritional information, and image analysis for food content evaluation. Additionally, it should provide personalized dietary recommendations, health tracking, and user-friendly reporting tools, all while ensuring data privacy and security. These features aim to support informed dietary decisions and

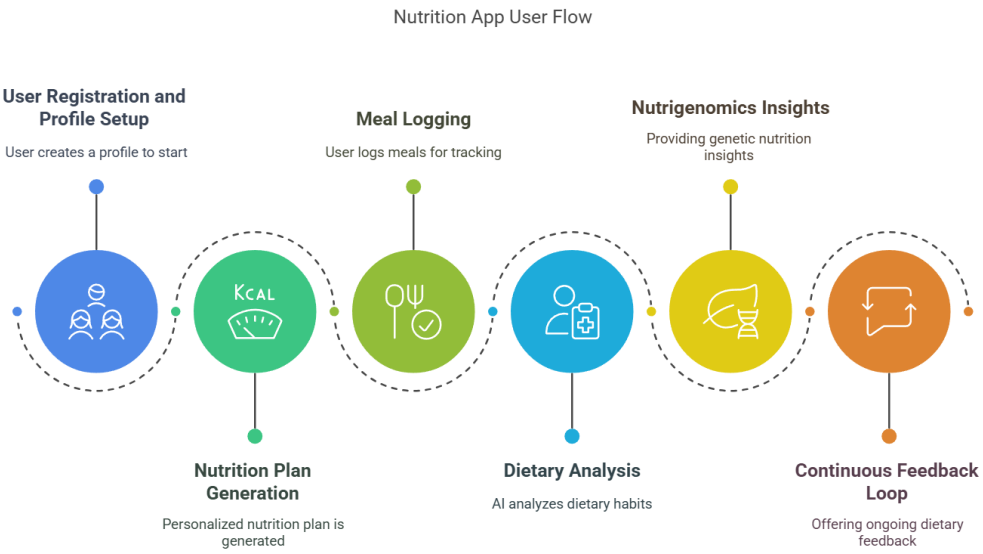
improved health outcomes.

2. **Constraints & Challenges:**
    - Ensuring real-time updates from **Gemini API**.
    - Handling **API rate limits** and optimizing API calls.
    - Providing a **smooth UI experience** with Python and other programming languages.

Phase-3: Project Design

Objective:

Develop the architecture and user flow of the application.



Key Points:

1. **System Architecture:**
    - User enters nutrition related query via chatbot.
    - Query is processed using **Google Gemini API**.
    - AI model fetches and processes the data.
    - The frontend displays **nutriton details, voice over, and diet plan**.

2. **User Flow:**
    - Step 1: User enters a query (e.g., "Rice”).
    - Step 2: The backend **calls the Gemini Flash API** to retrieve nutrition data.
    - Step 3: The app processes the data and **displays results** in an easy-to-read format.
3. **UI/UX Considerations:**
    - **Minimalist, user-friendly interface** for seamless navigation.
    - **Filters for nutrition data,diet planning, and features**.
    - **Dark & light mode** for better user experience.

Phase-4: Project Planning (Agile Methodologies)

Objective:

Break down development tasks for efficient completion.

Sprint	Task	Priority	Duration	Deadline	Assigned To	Dependencies	Expected Outcome
Sprint 1	Environment Setup & API Integration	🔴 High	(Day 1)	End of Day 1	Nithish Yadav,Sai Adarsh	Google API Key, Python, Streamlit setup	API connection established & working
Sprint 1	Frontend UI Development	🟡 Medium	(Day 1)	End of Day 1	Nithish Yadav	API response format finalized	Basic UI with input fields
Sprint 2	Nutrition Search	🔴 High	(Day 1)	Mid-Day 2	Sai Adarsh, Kountheya	API response, UI elements ready	Search functionality with filters
Sprint 2	Error Handling & Debugging	🔴 High	(Day 2)	Mid-Day 2	Nithish Yadav, Sunil	API logs, UI inputs	Improved API stability
Sprint 3	Testing & UI Enhancements	🟡 Medium	(Day 2)	Mid-Day 2	Nithish Yadav,Sunil	API response, UI layout completed	Responsive UI, better user experience
Sprint 3	Final Presentation & Deployment	🟢 Low	(Day 2)	End of Day 2	Entire Team	Working prototype	Demo-ready project

Sprint Planning with Priorities

Sprint 1 – Setup & Integration (Day 1)

(🔴 **High Priority)** Set up the **environment** & install dependencies.
(🔴 **High Priority)** Integrate **Google Gemini API**.
(🟡 **Medium Priority)** Build a **basic UI with input fields**.

Sprint 2 – Core Features & Debugging (Day 2)

(🔴 **High Priority)** Implement **search & comparison functionalities**.
(🔴 **High Priority)** Debug API issues & handle **errors in queries**.

Sprint 3 – Testing, Enhancements & Submission (Day 2)

(🟡 **Medium Priority)** Test API responses, refine UI, & fix UI bugs.
(🟢 **Low Priority)** Final **demo preparation & deployment**.

Phase-5: Project Development

Objective:

Implement core features of the Advancing Nutrition Science through GeminiAI App.

Key Points:

1. **Technology Stack Used:**
    - **Frontend:** HTML,CSS,JavaScript
    - **Backend:** Google Gemini Flash API
    - **Programming Language:** Python
2. **Development Process:**
    - Implement **API key authentication** and **Gemini API integration**.
    - **Minimalist, user-friendly interface** for seamless navigation.
    - Optimize **search queries for performance and relevance**.
3. **Challenges & Fixes:**
    - **Challenge:** Delayed API response times.
      Fix: Implement **caching** to store frequently queried results.

- **Challenge:** Limited API calls per minute.
  Fix: Optimize queries to fetch **only necessary data**.

Phase-6: Functional & Performance Testing

Objective:

Ensure that the **Advancing Nutrition Science through GeminiAI** Web App works as expected.

Test Case ID	Category	Test Scenario	Expected Outcome	Status	Tester
TC-001	Functional Testing	Query "Apple"	Nutrition details should be displayed.	✅ Passed	Nithish Yadav
TC-002	Functional Testing	Query "Diet Plan with user inputs"	A week nutrition diet plan will be displayed.	✅ Passed	Sunil
TC-003	Performance Testing	API response time under 500ms	API should return results quickly.	⚠ Needs Optimization	Kountheya
TC-004	Bug Fixes & Improvements	Fixed incorrect API responses.	Data accuracy should be improved.	✅ Fixed	Developer
TC-005	Final Validation	Ensure UI is responsive across devices.	UI should work on mobile & desktop.	❌ Failed - UI broken on mobile	Sai Adarsh
TC-006	Deployment Testing	Host the app using Streamlit Sharing	Web App should be accessible online.	🚀 Deployed	DevOps

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