Hackathon Project Phases Template for the **Advanced Nutrition Science website** project.

Hackathon Project Phases Template

Project Title:

Advancing Nutrition Science through GeminiAI

Team Name: Dwija

Team Members:

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Phase-1: Brainstorming & Ideation
Objective:

Leverage GeminiAI to revolutionize nutrition science by enabling data-driven, personalized, and scalable solutions that improve dietary health, prevent chronic diseases, and promote sustainable food systems globally

Key Points:

1. **Problem Statement:**

    - Nutrition plans are often generic and do not account for individual differences in genetics, metabolism, and lifestyle.
    - Limited AI-driven solutions exist to analyze nutrient-gene interactions and provide precision nutrition strategies.
    - Challenges in promoting sustainable and equitable food systems

2. **Proposed Solution**

- AI-powered personalized nutrition platform analyzing genetic, metabolic, and lifestyle data.
- AI-driven research tools to discover new nutrient-gene interactions.
- AI-based insights to promote sustainable and healthy dietary patterns.

3. **Target Users:**

- Individuals seeking personalized diet plans.
- Healthcare providers offering nutritional guidance.
- Researchers studying nutrient-gene interactions.
- Policymakers and public health officials.

4. **Expected Outcome:**

- A functional AI-driven personalized nutrition platform.
- Improved health outcomes through AI-based dietary recommendations.
- Insights supporting food innovation and public health policies.

Phase-2: Requirement Analysis

Objective: **Define the technical and functional requirements for AI-driven nutrition solutions.**

Key Points:

1. **Technical Requirements:**
    - Programming Language: **Python,java script**
    - Backend: **Google Gemini Flash API**
    - Frontend: **CSS,HTML**
    - Database: **Not required initially (API-based queries)**
2. **Functional Requirements:**
    - Ability to give **dietary recommendations** and **food analysis** using Gemini Flash API.
    - Display **calories intake, food recipie** in an intuitive UI.
    - Provide **real-time restaurants for better food on diet** based on diet plans
    - Allow users to follow **Better diet plans**
3. **Constraints & Challenges:**

- Ensuring data privacy and compliance with regulations (GDPR, HIPA0).
- Integrating diverse data sources (genetic, metabolic, dietary).
- Addressing algorithmic biases in AI models.

Phase-3: Project Design

Objective: Develop the architecture and user flow for the AI-driven nutrition platform.

Key Points:

1. **System Architecture:**

   - User inputs genetic, metabolic, and lifestyle data.
   - AI model processes data and identifies dietary recommendations.
   - Insights are displayed in an intuitive UI with real-time health tracking.

2. **User Flow:**

3. **UI/UX Considerations:**

   - **Minimalist, user-friendly interface** for seamless navigation.
   - **Filters for price, mileage, 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
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Sprint 1	Environment Setup & AI Model Training	High	6 hours (Day 1)	End of Day 1	Member 1	Dataset Preparation	Working AI Model
Sprint 2	UI Development & API Integration	Medium	4 hours (Day 2)	End of Day 2	Member 2	AI Model Completion	Functional Web UI
Sprint 3	Personalized Diet Plan Generation	High	6 hours (Day 3)	Mid-Day 3	Member 3	API Response Ready	Nutrition Plans Generated
Sprint 4	Behavioral Change Gamification	Medium	3 hours (Day 4)	End of Day 4	Member 4	UI Functional	Engagement Features Ready
Sprint 5	Testing & Refinements	Low	5 hours (Day 5)	End of Day 5	Entire Team	Complete System	Fully Tested Solution

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 AI-driven nutrition platform.

Key Points:

1. **Technology Stack Used:**

   · **Frontend:** React, Flask
   · **Backend:** Python (FastAPI), TensorFlow, PyTorch
   · **Database:** Not Required.
   · **AI Frameworks:** scikit-learn, TensorFlow, GPT models for recommendations

2. **Development Process:**

   · AI-based dietary recommendations using genetic and metabolic data.
   · Gamification features for sustained engagement.
   · Integration of public health insights into policy recommendations.

3. **Challenges & Fixes:**

   - **Challenge:** Data privacy compliance → **Fix:** Implement encryption and anonymization.
   - **Challenge:** AI model bias → **Fix:** Train on diverse datasets.
   - **Challenge:** User engagement → **Fix:** Gamification and real-time feedback.

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Phase-6: Functional & Performance Testing

Objective:

Ensure that the **Advanced Nutrition Science website** works as expected.

Test Case ID	Category	Test Scenario	Expected Outcome	Status	Tester
TC-001	Functional Testing	User inputs genetic data	Personalized diet plan is generated	✔ Passed	Tester 1
TC-002	Performance Testing	AI Model response time	Should be under 500ms	⚠ Needs Optimization	Tester 2
TC-003	Security Testing	Data encryption check	User data remains secure	✔ Passed	Tester 3
TC-004	Usability Testing	User interaction with UI	Smooth navigation and clear insights	✔ Passed	Tester 4

Final Submission

1. **Project Report Based on the templates**
2. **Demo Video (3-5 Minutes)**
3. **GitHub/Code Repository Link**
4. **Presentation**