



AI-Based Personalized Diet Chart Planner

Review 2

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System Architecture

The AI-powered diet planner follows a streamlined workflow that transforms user information into personalised nutritional guidance. Each stage builds upon the previous one to deliver accurate, science-backed dietary recommendations tailored to individual health goals.



1 User Input

Height, weight, goals

2 BMI Calculation

Health metrics

3 Dataset Matching

Nutrition alignment

4 AI Recommendation

Food selection

5 Diet Chart

Personalised plan

Dataset Foundation

The system leverages the comprehensive USDA Standard Food & Nutrition Dataset, containing detailed nutritional information for thousands of food items. This rich data source enables precise matching between user requirements and suitable food options.



Food Names

Comprehensive food catalogue

Macronutrients

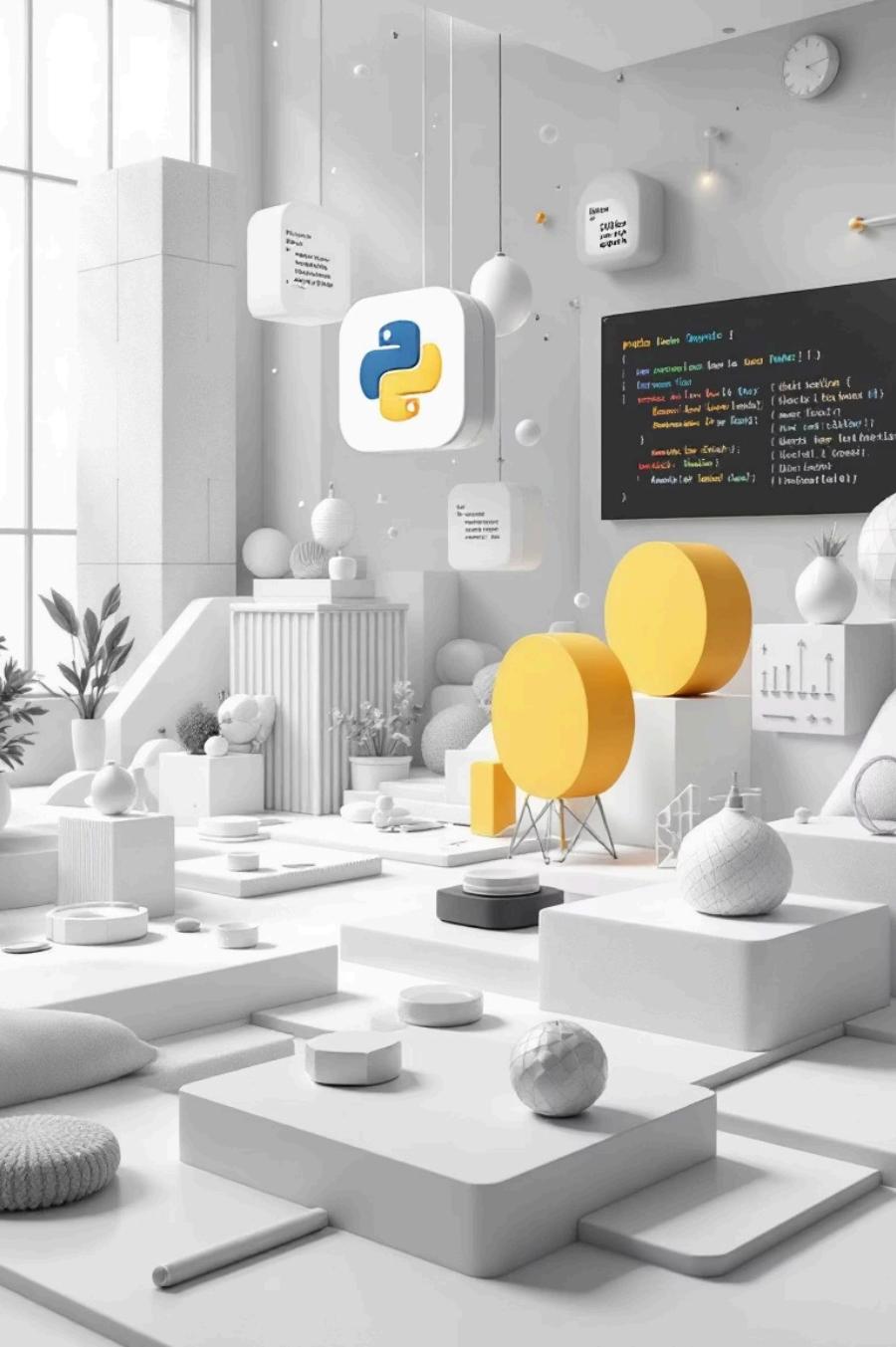
Carbs, proteins, fats

Micronutrients

Vitamins & minerals

Calories

Per serving data



Technical Stack

Built with industry-standard tools and libraries that ensure robust, scalable development. The combination of Python, data science libraries, and modern UI frameworks creates a seamless user experience.

Backend Development

- **Python** – Core programming language
- **Pandas** – Data manipulation & analysis
- **NumPy** – Numerical computations
- **Scikit-Learn** – Machine learning algorithms

Frontend & Data

- **Streamlit** – Interactive user interface
- **Web UI** – Responsive design
- **USDA CSV Dataset** – Nutritional data source

Core System Modules

The application is architected into five distinct modules, each handling a specific aspect of the diet planning process. This modular design ensures maintainability, scalability, and clear separation of concerns.

User Profile & Input

Captures personal health information and dietary preferences

BMI & Goal Analysis

Calculates health metrics and defines objectives

Food Recommendation Engine

Applies AI algorithms to match foods with goals

Diet Chart Generator

Creates structured daily meal plans

Report Display

Presents results through interactive visualisations



Process Flow

The system operates through a carefully orchestrated sequence of steps, beginning with user input and culminating in a comprehensive, actionable diet chart. Each stage processes and enriches the data for the next phase.



Methodology

The system follows a five-step scientific approach to personalised nutrition planning. Each stage builds upon previous insights to ensure recommendations are evidence-based, accurate, and aligned with individual health objectives.

1 Collect User Details

Age, weight, height, activity level, dietary preferences, and health goals

2 Calculate BMI & Caloric Needs

Determine daily calorie requirements based on metabolic rate and goals

3 Filter Dataset

Identify suitable foods matching nutritional and dietary constraints

4 AI-Powered Recommendation

Apply machine learning to select optimal foods for each meal

5 Generate Diet Chart

Create personalised weekly meal plan with calorie and nutrient balance

Key System Features

The platform offers comprehensive functionality designed to meet diverse nutritional needs. These features work in concert to deliver a truly personalised dietary experience that adapts to individual circumstances and goals.



Personalised Meal Plans

Tailored recommendations based on individual health profile and preferences



Multiple Diet Goals

Support for weight gain, loss, or maintenance objectives



Nutrient Calculations

Precise calorie and macronutrient breakdown for every meal



Interactive Interface

User-friendly design for seamless navigation and plan customisation



Expected Outcomes

The system is engineered to deliver tangible, meaningful results that directly enhance user experience and dietary outcomes. Through accurate recommendations and clear visualisations, users gain actionable insights into their nutrition.

100%

**Accuracy in
Recommendati
ons**

Evidence-based meal suggestions matched to individual requirements

∞

**Nutrient
Visualisations**

Clear breakdown of vitamins, minerals, macros, and micronutrients

✓

**Seamless
Experience**

Intuitive interface designed for user engagement and satisfaction

Summary & Impact

This AI-driven personalised diet chart planner represents a convergence of nutrition science, data analytics, and machine learning. By automating dietary recommendations, the system makes professional-grade nutritional guidance accessible to everyone, supporting healthier lifestyle choices and improved wellbeing.

Individualised Approach

Every recommendation customised to personal health profile



Health Empowerment

Enables informed decisions for sustainable wellbeing



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Data-Driven Insights

Leverages USDA dataset and machine learning algorithms

Accessibility

Democratises professional nutritional guidance