
NUTRITION AGENT PROJECT

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OUTLINE

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PROBLEM STATEMENT

In an era where health awareness is growing, individuals increasingly seek personalized nutrition guidance. However, most existing tools provide generic diet plans, lack real-time adaptability, and fail to consider a person's holistic lifestyle, cultural preferences, allergies, and evolving health conditions. Furthermore, dietitians and nutritionists face limitations in scaling personalized consultations due to time and resource constraints.

PROPOSED SOLUTION

Generative AI presents a groundbreaking opportunity to revolutionize this space by enabling an intelligent, interactive, and adaptive virtual nutrition assistant. By leveraging natural language processing (NLP), multimodal understanding, and large-scale dietary databases, an AI-powered assistant can generate dynamic meal plans, recommend smart food swaps, and explain nutritional choices—all tailored to the individual.

SYSTEM APPROACH

This project aims to develop “The Smartest AI Nutrition Assistant” using state-of-the-art generative AI models that:

- ☐ Understand user inputs via text, voice, or image (e.g., food photos, grocery labels)
- ☐ Generate personalized meal plans based on health goals, medical conditions, fitness routines, and preferences
- ☐ Offer contextual explanations (e.g., “Why is this food better?”)
- ☐ Adapt suggestions dynamically with continuous feedback

By integrating health data, food databases, and LLM-powered reasoning, the solution will bridge the gap between one-size-fits-all diet apps and in-person nutrition counselling—delivering an AI that thinks, learns, and cares like a real nutrition expert.

ALGORITHM & DEPLOYMENT

- **Data Input:**

- The model takes a variety of input related to the user, such as age, gender, food preferences, goals, weight and height

- **Training Process:**

- The model is trained on data from several health studies over the internet which gives it a large amount of data for people of all ages to make predictions accurately.

- **Prediction Process:**

- The model analyzes the training data to accurately predict a suitable training plan for the user.

RESULT



You: 01:12 PM

Give me a plan to gain 5 kilograms, I currently weigh 60 kgs, have a height of 6ft, am 19 years old, and only eat chicken in non vegetarian options



watsonx Agent 01:12 PM

To gain 5 kilograms, you'll need to increase your calorie intake and focus on consuming nutrient-dense foods. Here's a plan tailored to your preferences and current weight:

Calorie Requirement

To gain weight, you need to consume more calories than you burn. A general guideline is to aim for an additional 500-1000 calories per day. Given your current weight and height, let's aim for an additional 750 calories per day.

Macronutrient Breakdown

- **Protein:** Aim for 1.5-2 grams of protein per kilogram of body weight. For you, that's about 90-120 grams of protein per day.
- **Carbohydrates:** Carbohydrates should make up about 45-55% of your total calorie intake.
- **Fats:** Fats should make up about 20-35% of your total calorie intake.

RESULT

Meal Plan

Breakfast

- **Oatmeal with Banana and Peanut Butter:**
 - 1 cup of cooked oatmeal (150 calories)
 - 1 medium banana (105 calories)
 - 2 tablespoons of peanut butter (188 calories)
 - 1 scoop of whey protein powder (110 calories)
 - 1 cup of whole milk (150 calories)

Total: 603 calories

Mid-Morning Snack

RESULT

Mid-Morning Snack

- **Greek Yogurt with Granola:**
 - 1 cup of Greek yogurt (150 calories)
 - 1/2 cup of granola (250 calories)
 - 1 tablespoon of honey (64 calories)

Total: 464 calories

Lunch

- **Chicken Salad Sandwich:**
 - 2 slices of whole grain bread (200 calories)
 - 4 oz of grilled chicken breast (128 calories)
 - 1 tablespoon of mayonnaise (90 calories)
 - 1 cup of mixed greens (10 calories)

- 1 cup of mixed greens (10 calories)
- 1/2 avocado (120 calories)
- 1 medium apple (95 calories)

Total: 643 calories

Afternoon Snack

- **Protein Shake:**
 - 1 scoop of whey protein powder (110 calories)
 - 1 cup of whole milk (150 calories)
 - 1 medium banana (105 calories)

Total: 365 calories

RESULT

Dinner

- **Grilled Chicken with Sweet Potato and Vegetables:**

- 6 oz of grilled chicken breast (192 calories)
- 1 medium sweet potato (103 calories)
- 1 cup of steamed broccoli (55 calories)
- 1 tablespoon of olive oil (120 calories)

Total: 470 calories

Evening Snack

- **Cottage Cheese with Pineapple:**

- 1 cup of cottage cheese (220 calories)
- 1 cup of pineapple chunks (82 calories)

Total: 302 calories

Daily Total

- **Breakfast:** 603 calories
- **Mid-Morning Snack:** 464 calories
- **Lunch:** 643 calories
- **Afternoon Snack:** 365 calories
- **Dinner:** 470 calories
- **Evening Snack:** 302 calories

Total Daily Calories: 2847 calories

RESULT

Additional Tips

- **Stay Hydrated:** Drink plenty of water throughout the day.
- **Strength Training:** Incorporate strength training exercises to build muscle mass.
- **Monitor Progress:** Track your weight and adjust your calorie intake as needed.

This plan provides a balanced approach to gaining weight while focusing on nutrient-dense foods. Adjust the portions and calorie intake based on your progress and individual needs.

► How did I get this answer?



CONCLUSION

- The development of the nutrition AI agent showcased both the potential and practicality of leveraging intelligent systems to support healthy decision-making. Through personalized guidance, real-time analysis, and accessible recommendations, the agent demonstrated strong effectiveness in improving user awareness of dietary choices and fostering sustainable nutrition habits.

FUTURE SCOPE

- The agent should integrate local nutrition databases, cultural dietary norms, and user feedback for enriched personalization. Edge computing should be utilized to deploy lightweight inference models on mobile/IoT devices for faster, offline recommendations and reduced latency.

REFERENCES

- USDA FoodData Central: A comprehensive U.S. government database offering detailed food composition data, including branded foods, legacy datasets, and nutrient profiles.
- FooDB: A rich resource for food compound data, linking chemical properties, biological activities, and health effects across multiple databases.
- IBM cloud tutorials.
- <https://github.com/Atulya12Utkarsh/IBM-skillsbuild> (GitHub repository)

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Learning hours: 20 mins



THANK YOU