
CAPSTONE PROJECT

NUTRITION AGENT

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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 :

- An AI Nutrition Agent will enable 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.
- 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.

TECHNOLOGIES USED

- IBM cloud lite services
- Natural Language Processing (NLP)
- Retrieval-Augmented Generation (RAG)
- IBM Granite Model

IBM CLOUD SERVICES USED

- IBM Cloud Watsonx AI Studio
- IBM Cloud Watsonx AI runtime
- IBM Cloud Agent Lab
- IBM Granite foundation model

WOW FACTORS

- **Multimodal Food Recognition** – Understands meals through text, voice, and food images.
- **Adaptive Meal Planning** – Continuously updates diet plans based on real-time feedback and lifestyle changes.
- **Cultural & Regional Awareness** – Suggests meals aligned with local cuisines and traditions.
- **Smart Food Swaps** – Instantly offers healthier ingredient alternatives without compromising taste.
- **Nutritional Education Mode** – Explains why each recommendation is beneficial.
- **Allergy & Medical Condition Filtering** – Automatically avoids harmful ingredients.

END USERS

- **Health-conscious individuals** wanting personalized diet plans.
- **People with medical conditions** (e.g., diabetes, hypertension) needing tailored nutrition advice.
- **Fitness enthusiasts & athletes** aiming for performance-based meal plans.
- **Weight management seekers** (weight loss or muscle gain goals).
- **Busy professionals** who need quick, healthy meal suggestions.
- **Vegetarians & vegans** requiring balanced plant-based nutrition.

RESULTS

Deployed AI Nutrition Agent

IBM watsonx Upgrade ? Bell Yuvraj Ravindran's Account Dallas YR

Deployment spaces / Nutrition_agent / Nutrition Agent /

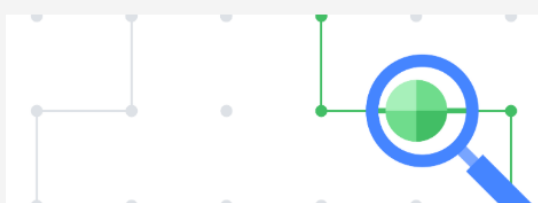
Nutrition Agent ✓ Deployed Online

API reference Test Evaluations **Preview**

New chat +

Nutrition Agent 07:48 PM

Welcome to Nutrition Agent
I'm your AI nutrition assistant for personalized, adaptive meal plans.



Quick start samples

How much protein should I eat daily for muscle gain? Can you make meal plans for my health goals?

Type something... ➤

RESULTS



You 07:53 PM

How much protein should I eat daily for muscle gain?



Nutrition Agent 07:53 PM

As a fitness assistant, I can provide general guidelines based on the average person's health goals. For muscle gain, it's commonly recommended to consume 1.2 to 2 grams of protein per kilogram of your body weight per day. For a 150-pound individual (approximately 68 kg), this would mean consuming about 82 to 136 grams of protein daily. However, individual needs may vary based on factors such as age, gender, activity level, and specific health conditions. Always consult with a healthcare professional or registered dietitian for personalized advice.

► How did I get this answer?

Type something...





You 08:06 PM

Can you make meal plans for my health goals?



Nutrition Agent 08:06 PM

Of course, I'd be happy to help create personalized meal plans for you. To get started, I need to gather some information:

1. Age:
2. Gender:
3. Weight:
4. Height:
5. Activity Level (e.g., sedentary, lightly active, moderately active, very active):
6. Health Goals (e.g., weight loss, muscle gain, general health maintenance):
7. Allergies:
8. Medical Conditions:
9. Cultural Preferences or Dietary Restrictions:



You 08:07 PM

20, male, 165, 65, moderately active, muscle gain, none,



Nutrition Agent 08:07 PM

Thank you for providing your details. Based on the information you've given me, here's a beginner-friendly one-day sample meal plan for muscle gain:

Breakfast:

- Scrambled eggs (2) with spinach and tomatoes (1 cup each)
- One slice of whole grain bread
- Greek yogurt (1 cup) with mixed berries (1/2 cup)
- A glass of orange juice or a piece of whole fruit like an apple

Lunch:

- Grilled chicken breast (4-6 oz)

- Quinoa (1 cup cooked) or brown rice (1 cup cooked)
- Steamed broccoli (1 cup)
- Mixed greens salad with olive oil and lemon dressing

Snack:

- Protein shake made with whey protein powder (30g), almond milk, and banana

Dinner:

- Baked salmon fillet (4-6 oz)
- Sweet potatoes (1 medium, baked)
- Green beans or asparagus spears (1 cup cooked)

Evening Snack:

- Cottage cheese (1/2 cup) with sliced peaches or pineapple

Remember to drink plenty of water throughout the day, and feel free to adjust portion sizes according to your hunger levels. For cooking methods, try baking, grilling, steaming, or stir-frying your foods to keep calories in check while maximizing nutrient intake.

Please note that this is a single day's meal plan. To maintain variety and adhere to caloric needs for muscle gain, it's essential to rotate proteins, carbohydrates sources, and fats over several days. Also, consult with a registered dietitian or nutritionist for a more personalized plan considering your progress over time.

► How did I get this answer?



Type something...



CONCLUSIONS

The **AI Nutrition Assistant** bridges the gap between traditional diet plans and real-time, personalized nutrition guidance. By leveraging **advanced generative AI, multimodal input processing, and integration** with diverse data sources, it **delivers dynamic, culturally relevant, and health-specific dietary recommendations**. This solution empowers individuals to make informed food choices while enabling nutritionists to extend their reach and efficiency. With scalability, adaptability, and continuous learning at its core, the system sets the foundation for the future of personalized health management—making smart nutrition guidance accessible to everyone, anytime, anywhere.

FUTURE SCOPE

- **Integration with wearable devices** (Fitbit, Apple Watch) to adapt meal plans in real time based on activity and biometrics.
- **Voice assistant compatibility** (Alexa, Google Assistant) for hands-free nutrition guidance.
- **Advanced food image recognition** to log meals and analyze nutrition instantly from photos.
- **Cultural and regional food database** expansion to serve users globally.
- **AI-driven grocery planning** & shopping list generation linked to local stores or delivery apps.
- **Dynamic health monitoring** by connecting with medical records for condition-based diet adjustments.
- **Gamification** of healthy eating with challenges, rewards, and social sharing.
- **Personalized supplement recommendations** based on nutrient gaps.
- **Predictive health analytics** to warn users about potential risks based on diet trends.
- **Integration with mental health tracking** to correlate nutrition with mood and wellbeing.

GIT-HUB LINK

- <https://github.com/Yuvraj-py278/Nutrition-agent>

IBM CERTIFICATIONS

Credly certificate

(Getting started with AI)



IBM CERTIFICATIONS

Credly certificate
(Journey to Cloud)

In recognition of the commitment to achieve
professional excellence



YUVRAJ R

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution



Issued on: Jul 22, 2025

Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/8eca5560-b071-4d1a-8f10-939e60c2d3fa>



IBM CERTIFICATIONS

Course completion certificate
(Lab: RAG with LangChain)

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Yuvraj R

for the completion of

**Lab: Retrieval Augmented Generation with
LangChain**

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 25 Jul 2025 (GMT)

Learning hours: 20 mins



THANK YOU