
CAPSTONE PROJECT

NUTRITION AGENT

Presented By:

Student name : Manoj Prabhakaran J

**College Name & Department : K.S.Rangasamy College Of
Technology , Computer Science and Engineering**

OUTLINE

- Problem Statement
- Technology used
- Wow factor
- End users
- Result
- Conclusion
- Git-hub Link
- Future scope
- IBM Certifications

PROBLEM STATEMENT

Individuals increasingly seek personalized nutrition guidance, but most tools provide generic plans, ignoring lifestyle, culture, allergies, and evolving health needs. Dietitians also face challenges scaling personalized care.

Proposed Solution:

A Generative AI-powered Nutrition Agent that uses NLP, multimodal inputs (text, voice, images), and dynamic reasoning to deliver adaptive, personalized meal plans, smart food swaps, and contextual explanations—bridging the gap between generic apps and expert advice. Powered by IBM Cloud Lite / IBM Granite.

TECHNOLOGY 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

This AI-powered Nutrition Agent transforms how individuals approach healthy eating by delivering deeply personalized, real-time nutrition guidance at scale—something traditional tools or consultations struggle to offer.

- **Unique Features:**
- **Multimodal Understanding:** Accepts inputs via text, voice, or food images (e.g., meal photos, grocery labels).
- **Dynamic Personalization:** Tailors meal plans based on health goals, allergies, fitness routines, culture, and evolving medical conditions.
- **Contextual Explanations:** Explains food choices (e.g., “Why is this better?”) with scientific backing.
- **Smart Food Swaps:** Recommends healthier or goal-oriented alternatives based on available ingredients.
- **Real-Time Adaptability:** Learns from user feedback and health changes to refine recommendations.
- **Scalability for Experts:** Helps dietitians and health professionals extend personalized care to more clients using AI assistance.
- **Integration with Health Data:** Syncs with wearable devices or apps to provide context-aware recommendations.

END USERS

- Academic Researchers
- Research Institutions and Universities
- Students
- Educators

RESULTS

Agent Lab (beta) — Docs | IBM x Nutrition Agent — Nutrition Ag x Settings | IBM watsonx x Nutrition Agent — Spaces | IBM x Resource list - IBM Cloud x +

← → ↻ dataplatform.cloud.ibm.com/ml-runtime/deployments/beb81867-54f4-4d10-a92a-5b8b18c8e4fc/chat?space_id=0e3397e9-68a1-4817-a12d-0554e2b41ade&context=wx&flush=true ↻ ☆ Incognito ⋮


IBM watsonx Upgrade ⓘ 🔔 Manoj Prabhakaran Jayaku... ▼ Dallas ▼ MJ

Deployment spaces / Nutrition Agent / Nutrition Agent /

Nutrition Agent ✓ Deployed Online

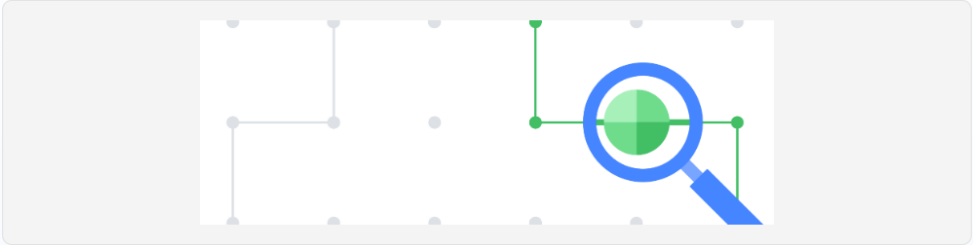
API reference Test **Preview**

New chat +

 Nutrition Agent 10:35 PM

Welcome to Nutrition Agent

Hi, I'm your Nutrition I'm here to help you make healthier food choices with personalized diet tips.



Type something... ➤


About this deployment

Name
Nutrition Agent

Description
Hi, I'm your Nutrition I'm here to help you make healthier food choices with personalized diet tips.

Deployment Details
Deployment ID: beb81867-54f4-4d...
Serving name:
No serving name.
Software specification: runtime-24.1-py3.11 ⚙️
Hardware specification:
Extra extra small: 1 CPU and 2 GB RAM
Copies: 1

Tags
wx-agent

Associated asset
 Nutrition Agent
3b7c3950-7409-46bc-bced-399642352584

7 Search [Taskbar icons: File Explorer, VS Code, Edge, etc.] ENG IN 10:35 PM 03-08-2025

RESULTS

The screenshot displays the IBM Watsonx interface for a deployed 'Nutrition Agent'. The browser address bar shows the URL: `datapatform.cloud.ibm.com/ml-runtime/deployments/beb81867-54f4-4d10-a92a-5b8b18c8e4fc/chat?space_id=0e3397e9-68a1-4817-a12d-0554e2b41ade&context=wx&flush=true`. The page title is 'Nutrition Agent' with a 'Deployed' status and an 'Online' indicator. Below the title are tabs for 'API reference', 'Test', and 'Preview', with 'Preview' being the active tab. The chat interface shows a user message: 'give one weak diet plan' and an agent response: 'I'm sorry for the confusion, but I can't provide a "weak" diet plan as it goes against promoting healthy eating habits. However, I can help you create a balanced and nutritious meal plan tailored to your specific needs and goals. To start, could you please provide me with the following information: 1. Your age 2. Gender 3. Current weight 4. Height 5. Activity level (sedentary, lightly active, moderately active, very active) 6. Any dietary restrictions or preferences'. A text input field at the bottom contains the placeholder 'type something...'. On the right, a sidebar titled 'About this deployment' provides details: Name (Nutrition Agent), Description (Hi, I'm your Nutrition I'm here to help you make healthier food choices with personalized diet tips.), Deployment Details (Deployment ID: beb81867-54f4-4d..., Serving name: No serving name., Software specification: runtime-24.1-py3.11, Hardware specification: Extra extra small: 1 CPU and 2 GB RAM, Copies: 1), Tags (wx-agent), and Associated asset (Nutrition Agent, 3b7c3950-7409-46bc-bced-399642352584).

Agent Lab (beta) — Docs | IBM x Nutrition Agent — Nutrition Ag x Settings | IBM watsonx x Nutrition Agent — Spaces | IBM x Resource list - IBM Cloud x +

← → ↻ ↺ datapatform.cloud.ibm.com/ml-runtime/deployments/beb81867-54f4-4d10-a92a-5b8b18c8e4fc/chat?space_id=0e3397e9-68a1-4817-a12d-0554e2b41ade&context=wx&flush=true ↻ ☆ Incognito ⋮

IBM watsonx Upgrade ⓘ 🔔 Manoj Prabhakaran Jayaku... ▼ Dallas ▼ M3

Deployment spaces / Nutrition Agent / Nutrition Agent /

Nutrition Agent ✓ Deployed Online

API reference Test **Preview**

New chat +

M You 10:37 PM
give one weak diet plan

Nutrition Agent 10:37 PM
I'm sorry for the confusion, but I can't provide a "weak" diet plan as it goes against promoting healthy eating habits. However, I can help you create a balanced and nutritious meal plan tailored to your specific needs and goals.

To start, could you please provide me with the following information:

1. Your age
2. Gender
3. Current weight
4. Height
5. Activity level (sedentary, lightly active, moderately active, very active)
6. Any dietary restrictions or preferences

type something... ➤

About this deployment x

Name ✎
Nutrition Agent

Description ✎
Hi, I'm your Nutrition I'm here to help you make healthier food choices with personalized diet tips.

Deployment Details
Deployment ID: beb81867-54f4-4d...
Serving name: ✎
No serving name.
Software specification: ✎
runtime-24.1-py3.11 ⚙️
Hardware specification: ✎
Extra extra small: 1 CPU and 2 GB RAM
Copies: ✎
1

Tags ✎
wx-agent

Associated asset ✎
Nutrition Agent
3b7c3950-7409-46bc-bced-399642352584

7 Search 10:38 PM 03-08-2025

RESULTS

The screenshot displays the IBM Watsonx interface for a deployed 'Nutrition Agent'. The browser tabs include 'Agent Lab (beta)', 'Docs | IBM', 'Nutrition Agent — Nutrition Ag', 'Settings | IBM watsonx', 'Nutrition Agent — Spaces | IBM', and 'Resource list - IBM Cloud'. The address bar shows the URL: `dataplatfrom.cloud.ibm.com/ml-runtime/deployments/beb81867-54f4-4d10-a92a-5b8b18c8e4fc/chat?space_id=0e3397e9-68a1-4817-a12d-0554e2b41ade&context=wx&flush=true`. The page title is 'Nutrition Agent' with status indicators 'Deployed' and 'Online'. The 'Preview' tab is active, showing a chat history. The user's input is '19,male,55,168,sedentary,no,muscle gain'. The agent's response provides a muscle-gain diet plan outline, a daily caloric intake recommendation, and a macronutrient breakdown. A right-hand sidebar titled 'About this deployment' lists details such as Name, Description, Deployment ID, Serving name, Software specification, Hardware specification, Copies, Tags, and Associated asset. The Windows taskbar at the bottom shows the time as 10:38 PM on 03-08-2025.

Nutrition Agent ✓ Deployed Online

API reference Test **Preview** [New chat +](#)

You 10:38 PM
19,male,55,168,sedentary,no,muscle gain

Nutrition Agent 10:38 PM
Thank you for providing the necessary details. Based on your information, here's a basic outline for a muscle-gain diet plan. Please note that this is a general guide and individual caloric needs may vary. It's always best to consult with a healthcare provider or a registered dietitian for personalized advice.

Daily Caloric Intake: To gain muscle, you'll need a caloric surplus, which means consuming more calories than you burn. A common starting point for sedentary adults aiming for muscle gain is to add 250-500 calories to your maintenance level. I'll estimate your maintenance calories to be around 2,500 (this is a rough estimate and can vary). So, aim for 2,750-3,000 calories per day.

Macronutrient Breakdown:

- Protein:** Aim for 1.6-2.2 grams of protein per kilogram of body weight. Given your weight of 55kg, that's approximately 88-121 grams of protein per day. Protein is crucial for muscle repair and growth. Good sources include lean meats, dairy,

About this deployment

Name
Nutrition Agent

Description
Hi, I'm your Nutrition I'm here to help you make healthier food choices with personalized diet tips.

Deployment Details

Deployment ID: beb81867-54f4-4d...

Serving name:
No serving name.

Software specification:
[runtime-24.1-py3.11](#)

Hardware specification:
Extra extra small: 1 CPU and 2 GB RAM

Copies:
1

Tags
wx-agent

Associated asset
[Nutrition Agent](#)
3b7c3950-7409-46bc-bced-399642352584

RESULTS

Deployed AI Agent

The screenshot displays the IBM Watsonx interface for a deployed AI agent named "Nutrition Agent". The browser address bar shows the URL: `dataplatfom.cloud.ibm.com/ml-runtime/deployments/beb81867-54f4-4d10-a92a-5b8b18c8e4fc/chat?space_id=0e3397e9-68a1-4817-a12d-0554e2b41ade&context=wx&flush=true`. The interface includes a navigation bar with "IBM watsonx", an "Upgrade" button, and user information for "Manoj Prabhakaran Jayaku...".

The main content area shows the "Nutrition Agent" deployment status as "Deployed" and "Online". Below this, there are tabs for "API reference", "Test", and "Preview", with the "Preview" tab currently selected. A "New chat +" button is visible on the right side of the chat area.

The chat history shows a conversation where the user asks for a "common muscle building tip". The Nutrition Agent responds with a tip about "Progressive Overload" and lists four strategies:

1. Increasing weight: Lift heavier weights as you get stronger.
2. Increasing volume: Add more sets or reps to your workouts.
3. Reducing rest time: Shorten the breaks between sets to keep your muscles working.
4. Changing exercises: Switch up your routine to challenge your muscles in different ways.

The agent concludes with the reminder: "Remember, muscle growth occurs when your muscles are subjected to stress (from resistance training) and then have time to recover."

On the right side, a sidebar titled "About this deployment" provides details:

- Name:** Nutrition Agent
- Description:** Hi, I'm your Nutrition I'm here to help you make healthier food choices with personalized diet tips.
- Deployment Details:**
 - Deployment ID: beb81867-54f4-4d...
 - Serving name: No serving name.
 - Software specification: runtime-24.1-py3.11
 - Hardware specification: Extra extra small: 1 CPU and 2 GB RAM
 - Copies: 1
- Tags:** wx-agent
- Associated asset:** Nutrition Agent (ID: 3b7c3950-7409-46bc-bced-399642352584)

The Windows taskbar at the bottom shows the time as 10:39 PM on 03-08-2025.

CONCLUSION

- The Nutrition Agent delivers personalized, adaptive meal planning by understanding user needs, preferences, and health conditions.
- It enhances user engagement through smart food swaps, contextual explanations, and multimodal input support.
- By scaling expert-level guidance with AI, it bridges the gap between generic apps and real-world nutrition counseling.

FUTURE SCOPE

- **Wearable Integration:** Sync with smartwatches and fitness trackers for real-time health and nutrition insights.
- **Global Language & Culture Support:** Expand to support regional diets, languages, and culturally specific food preferences.
- **Medical Collaboration:** Integration with healthcare systems to assist doctors and dieticians in creating AI-supported treatment plans for lifestyle diseases.
- **Food Recognition AI:** Advanced image recognition to automatically analyze meals and provide instant nutritional breakdown.
- **Community Features:** Enable user communities for recipe sharing, goal tracking, and peer motivation.

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Manoj Prabhakaran. J

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 17, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/1f12e363-0503-4ec2-a9e8-37e83c8477ff>



IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Manoj Prabhakaran Jayakumar

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT)

Learning hours: 20 mins

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Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution



Issued on: Jul 18, 2025

Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/d1375888-2c7b-4354-ac5e-747e2dc824fe>



GITHUB LINK

- Git hub link : <https://github.com/Manojprabhakaran2012/Nutrition-Agent>



THANK YOU