
CAPSTONE PROJECT

NUTRITION AGENT

Presented By

Student name : Athira Pillai

College Name : Vijaya Vittala Institute Of Technology

Department : CSE in AIML

OUTLINE

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

PROBLEM STATEMENT

The Challenge - 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.

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 agent involves emphasizing unique, futuristic, or highly valuable capabilities that differentiate it from standard applications.

Unique features:

1. Built on IBM Cloud for Enterprise-Grade Trust
2. Agentic Behavior with Autonomy
3. Seamless Integration with Enterprise and Consumer Apps
4. Agentic Personalization at Scale
5. Dynamic Nutrient Forecasting
6. Explainable AI Recommendations

END USERS

- Individual consumers
- Health care sector
- Fitness and Lifestyle Platforms
- Wellness Programs

RESULTS

Browser tabs: WhatsApp, Agent Lab (beta) — Docs, Nutrition_Agent — Nutritio, Nutrition_Agent — Nutritio, Settings | IBM watsonx, Deployments | IBM watsonx

URL: dataplatform.cloud.ibm.com/ml-runtime/deployments/874224f1-ca9b-4a64-909d-4de03cd87e8a/chat?space_id=5af6cc5a-7f0c-4592-baf2-8aeb0ed8abe6&context=wx&flush=true

IBM watsonx Upgrade ? Bell Athira Pillai's Account Dallas AP

Deployment spaces / Nutrition_Agent / Nutrition_Agent /

Nutrition_Agent Deployed Online


API reference Test **Preview**

New chat +

Nutrition_Agent 07:58 PM

Welcome to Nutrition_Agent

Hi there! 🍌 I'm your Nutrition AI Coach. Ready to fuel your day with smart, healthy choices?



Type something...

About this deployment

Name
Nutrition_Agent

Description
Hi there! 🍌 I'm your Nutrition AI Coach. Ready to fuel your day with smart, healthy choices?

Deployment Details

Deployment ID: 874224f1-ca9b-4a...

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](#)
f0b33ab7-a39c-455d-86fb-bf512ce3dd4b

28°C Mostly sunny Search 19:58 02-08-2025

RESULTS

The screenshot displays the IBM Watsonx web interface. The browser's address bar shows the URL: `dataplatfom.cloud.ibm.com/ml-runtime/deployments/874224f1-ca9b-4a64-909d-4de03cd87e8a/chat?space_id=5af6cc5a-7f0c-4592-baf2-8aeb0ed8abe6&context=wx&flush=true`. The page header includes the IBM Watsonx logo, an 'Upgrade' button, and user information for 'Athira Pillai's Account' in the 'Dallas' region. The main content area shows the 'Nutrition_Agent' deployment, which is 'Deployed' and 'Online'. Below this, there are tabs for 'API reference', 'Test', and 'Preview', with the 'Preview' tab selected. The chat interface shows a user message: 'Give me a high protein, iron rich vegetarian meal ideas'. The agent's response provides three meal ideas: 1. **Lentil and Spinach Curry**, 2. **Quinoa Stuffed Bell Peppers**, and 3. **Tofu Stir Fry with Broccoli**. A text input field at the bottom contains the placeholder 'Type something...'. The Windows taskbar at the bottom shows the date as 02-08-2025 and the time as 20:09.

Deployment spaces / Nutrition_Agent / Nutrition_Agent /

Nutrition_Agent ✓ Deployed Online

API reference Test **Preview**

New chat +

You 08:09 PM
Give me a high protein, iron rich vegetarian meal ideas

Nutrition_Agent 08:09 PM
Here are a few high-protein, iron-rich vegetarian meal ideas:

- Lentil and Spinach Curry:** Lentils are an excellent source of protein and iron. A curry made with lentils, spinach, tomatoes, onions, garlic, ginger can be both hearty and nutritious. Serve it over brown rice for added fiber and whole grains.
- Quinoa Stuffed Bell Peppers:** Quinoa is one of the few plant foods that contain all nine essential amino acids (making it a complete protein). Combine cooked quinoa with black beans (high in iron), corn, diced tomatoes, spices like cumin or chili powder stuff them into bell peppers halves for baking until tender.
- Tofu Stir Fry with Broccoli:** Tofu provides good amounts of protein while broccoli offers plenty of iron alongside other vitamins and minerals from colorful veggies such as carrots or zucchini included in the stir fry sauce could include soy sauce or tamari for flavoring plus some sesame oil if desired.

Type something...

28°C Mostly sunny Search 20:09 02-08-2025

RESULTS

The screenshot displays the IBM Watsonx interface for the 'Nutrition_Agent'. The browser tabs include 'WhatsApp', 'Agent Lab (beta) — Docs', 'Nutrition_Agent — Nutriti...', 'Nutrition_Agent — Nutriti...', 'Settings | IBM watsonx', and 'Deployments | IBM watsonx'. The address bar shows the URL: `datapatform.cloud.ibm.com/ml-runtime/deployments/874224f1-ca9b-4a64-909d-4de03cd87e8a/chat?space_id=5af6cc5a-7f0c-4592-baf2-8aeb0ed8abe6&context=wx&flush=true`. The IBM Watsonx header includes an 'Upgrade' button, a help icon, a notification bell, and user information for 'Athira Pillai's Account' in 'Dallas'. The breadcrumb trail is 'Deployment spaces / Nutrition_Agent / Nutrition_Agent /'. The agent status is 'Nutrition_Agent' with a green checkmark for 'Deployed' and a grey circle for 'Online'. Below the status are tabs for 'API reference', 'Test', and 'Preview', with 'Preview' being the active tab. A 'New chat +' button is located on the right. The chat area contains the following text:

1. **Lentil and Spinach Curry:** Lentils are an excellent source of protein and iron. A curry made with lentils, spinach, tomatoes, onions, garlic, ginger can be both hearty and nutritious. Serve it over brown rice for added fiber and whole grains.

2. **Quinoa Stuffed Bell Peppers:** Quinoa is one of the few plant foods that contain all nine essential amino acids (making it a complete protein). Combine cooked quinoa with black beans (high in iron), corn, diced tomatoes, spices like cumin or chili powder stuff them into bell peppers halves for baking until tender.

3. **Tofu Stir Fry with Broccoli:** Tofu provides good amounts of protein while broccoli offers plenty of iron alongside other vitamins and minerals from colorful veggies such as carrots or zucchini included in the stir fry sauce could include soy sauce or tamari for flavoring plus some sesame oil if desired

4**Chickpeas Salad:** Chickpeas are rich in both protein & Iron; mix them up with fresh greens like arugula or spinach , add cherry tomatoes , cucumber , red onion . Dress it simply with olive oil , lemon juice salt & pepper . You can also top this salad off with pumpkin seeds which adds extra crunch alongside additional trace minerals including magnesium & zinc .

Remember that Vitamin C enhances your body's ability to absorb non-heme (plant based) iron found in these dishes when consumed together!

At the bottom of the chat area is a text input field with the placeholder 'Type something...' and a send button (triangle icon). The Windows taskbar at the bottom shows the date and time as '02-08-2025 20:10', the language as 'ENG IN', and the weather as '28°C Mostly sunny'.

RESULTS

The screenshot displays a web browser window with multiple tabs open, including WhatsApp, Agent Lab (beta), and Nutrition_Agent. The active tab shows the IBM Watsonx interface for the Nutrition_Agent deployment. The URL is `datapatform.cloud.ibm.com/ml-runtime/deployments/874224f1-ca9b-4a64-909d-4de03cd87e8a/chat?space_id=5af6cc5a-7f0c-4592-baf2-8aeb0ed8abe6&context=wx&flush=true`. The interface includes a navigation bar with 'IBM watsonx', an 'Upgrade' button, and user information for 'Athira Pillai's Account' in 'Dallas'. Below the navigation bar, the breadcrumb 'Deployment spaces / Nutrition_Agent / Nutrition_Agent /' is visible. The main content area shows the 'Nutrition_Agent' deployment status as 'Deployed' and 'Online'. There are three tabs: 'API reference', 'Test', and 'Preview', with 'Preview' being the active tab. A 'New chat +' button is located in the top right corner of the chat area. The chat history shows a user message at 08:10 PM asking for 'meal prep ideas for a broke college student'. The Nutrition_Agent response at 08:10 PM states that meal prepping on a budget is possible and provides three ideas: 1. **Batch Cooking Grains and Beans:** Rice, quinoa, lentils, chickpeas can be cooked in large batches at the start of the week. They're cheap sources of carbohydrates and protein that pair well with many vegetables or lean meats if you choose to include them later in the week. 2. **Stir-Fries:** Use affordable proteins like eggs or tofu combined with whatever vegetables are on sale (like bell peppers, broccoli, zucchini). You can make different stir fry combinations throughout the week by just changing up your veggies and adding sauce variations from pantry items such as soy sauce or peanut butter for flavor without breaking the bank. 3. **Soups & Stews:** Make big pots of soup using seasonal vegetables which tend to be cheaper along with bulk grains like. At the bottom of the chat area is a text input field with the placeholder 'Type something...' and a send button. The Windows taskbar at the bottom shows the system clock as 20:10 on 02-08-2025, with a temperature of 28°C and 'Mostly sunny' weather.

Deployment spaces / Nutrition_Agent / Nutrition_Agent /

Nutrition_Agent ✓ Deployed Online

API reference Test **Preview**

New chat +

You 08:10 PM
meal prep ideas for a broke college student

Nutrition_Agent 08:10 PM
Meal prepping on a budget as a college student is definitely possible. Here are some ideas:

- Batch Cooking Grains and Beans:** Rice, quinoa, lentils, chickpeas can be cooked in large batches at the start of the week. They're cheap sources of carbohydrates and protein that pair well with many vegetables or lean meats if you choose to include them later in the week.
- Stir-Fries:** Use affordable proteins like eggs or tofu combined with whatever vegetables are on sale (like bell peppers, broccoli, zucchini). You can make different stir fry combinations throughout the week by just changing up your veggies and adding sauce variations from pantry items such as soy sauce or peanut butter for flavor without breaking the bank.
- Soups & Stews:** Make big pots of soup using seasonal vegetables which tend to be cheaper along with bulk grains like

Type something...

28°C Mostly sunny 20:10 02-08-2025

RESULTS

The screenshot displays the IBM Watsonx interface for the 'Nutrition_Agent'. The browser address bar shows the URL: `dataplatfrom.cloud.ibm.com/ml-runtime/deployments/874224f1-ca9b-4a64-909d-4de03cd87e8a/chat?space_id=5af6cc5a-7f0c-4592-baf2-8aeb0ed8abe6&context=wx&flush=true`. The interface includes a top navigation bar with 'IBM watsonx' and an 'Upgrade' button. Below this, a breadcrumb trail reads 'Deployment spaces / Nutrition_Agent / Nutrition_Agent /'. The main content area is titled 'Nutrition_Agent' with a 'Deployed Online' status. It features three tabs: 'API reference', 'Test', and 'Preview', with the 'Preview' tab currently selected. A 'New chat +' button is located in the top right corner of the chat area. The chat content includes two numbered items: '2. Stir-Fries' and '3. Soups & Stews', each with a detailed paragraph of text. A link 'How did I get this answer?' is present below the second item. At the bottom of the chat area is a text input field with the placeholder 'Type something...'. The Windows taskbar at the very bottom shows the date as 02-08-2025 and the time as 20:10.

Deployment spaces / Nutrition_Agent / Nutrition_Agent /

Nutrition_Agent Deployed Online

API reference Test **Preview**

New chat +

2. **Stir-Fries:** Use affordable proteins like eggs or tofu combined with whatever vegetables are on sale (like bell peppers, broccoli, zucchini). You can make different stir fry combinations throughout the week by just changing up your veggies and adding sauce variations from pantry items such as soy sauce or peanut butter for flavor without breaking the bank.

3. **Soups & Stews:** Make big pots of soup using seasonal vegetables which tend to be cheaper along with bulk grains like barley or pasta for heartiness; these freeze well too allowing future meals when time's short during busy weeks ahead . Chili is another great option - it uses relatively inexpensive ingredients like ground turkey/beef (or even just mushrooms for a vegetarian version), kidney beans, and canned diced tomatoes

Remember portion control while prepping – buying larger bags often reduces cost per serving but ensure not overeating due to convenience! Also consider shopping sales flyers & planning menus around discounted produce items each week for maximum savings!

► How did I get this answer?

↻

Type something...

RESULTS

★ The AI gathers user data from multiple sources

★ Using IBM Watson and foundation models:

- Natural Language Processing (NLP): Interprets medical texts, user queries
- Predictive modeling: Forecasts health risks and nutritional deficiencies
- Optimization engine: Matches dietary needs to best foods/meals
- Agent logic: Uses planning and memory (like LangChain-style agents) to act on behalf of the user

★ The AI generates:

Custom daily meal plans

Grocery shopping lists (linked to local stores)

Supplement suggestions

Calorie/macronutrient breakdowns

CONCLUSION

- The agent delivers highly tailored meal plans, grocery lists, and lifestyle nudges that adapt in real time to each user's habits, goals, and preferences.
- The AI handles the “what, when, and how” of daily nutrition.
- It intelligently using inputs like habits, preferences, and activity, the agent transforms raw data into meaningful food choices, without user overwhelm.

FUTURE SCOPE

- Integration with smart kitchens
- Voice-first nutrition assistants on devices like Alexa, Siri, or in cars
- Augmented reality (AR) meal planning
- Emotion-aware food recommendations based on mood or stress levels
- AI-guided food discovery personalized by taste, culture, and location
- Sustainability tracking — AI suggests eco-friendly or low-waste diets
- Social + gamified wellness ecosystems with shared meal plans and AI coaching

IBM CERTIFICATIONS



IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Athira Pillai

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

Git hub link : <https://github.com/Athira-pillai/Nutrition-Agent.git>

GITHUB LINK

- <https://github.com/Athira-pillai/Nutrition-Agent/blob/main/README.md>



THANK YOU