
IBM AICTE PROJECT

NUTRITION EXPERT 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** without customization.
- Lack **real-time adaptability** to health changes or user feedback.
- Ignore **holistic factors** like allergies, cultural preferences, and fitness routines.
- Struggle to scale **personalized consultations** due to resource constraints.

Proposed Solution:

A Smart AI Nutrition Assistant powered by IBM watsonx that leverages:

- **Natural Language Processing (NLP)** to understand text/voice inputs (e.g., "I'm lactose-intolerant and need high-protein snacks").
- **Multimodal AI** to analyze food images/grocery labels.
- **Retrieval-Augmented Generation (RAG)** grounded in dietary databases (e.g., USDA, WHO guidelines).
- **Dynamic Adaptation** to refine suggestions based on user feedback.

TECHNOLOGY USED

IBM Cloud Lite services

- watsonx.ai Studio
- watsonx Runtime
- Cloud Object Storage (for nutrition datasets)

Natural Language Processing (NLP)

- Analyzes text/voice inputs (e.g., *"I need gluten-free breakfast ideas"*)

Retrieval-Augmented Generation (RAG)

- Grounds responses in USDA/WHO dietary databases

IBM Granite model

- Powers nutritional reasoning and dynamic meal planning

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 nutrition assistant will revolutionize personalized health guidance by delivering instant, tailored diet plans that adapt to users' unique needs and feedback in real-time.

Unique features:

- **Dynamic meal planning** based on health goals, allergies, and cultural preferences
- **Nutritional intelligence** with explainable recommendations (e.g., "Why quinoa is ideal for gluten-free diets")
- **Real-time adaptation** that improves suggestions based on user feedback
- **Smart food swaps** for dietary restrictions (e.g., vegan, diabetic-friendly alternatives)
- **Integration with health databases** (USDA, WHO guidelines) for scientifically-backed advice

END USERS

- Health-conscious individuals
- Patients with dietary restrictions (diabetes, allergies, etc.)
- Fitness enthusiasts and athletes
- Nutritionists and dietitians
- Healthcare providers

RESULTS

Nutrition Expert ✓ Deployed Online

API reference

Test

Preview

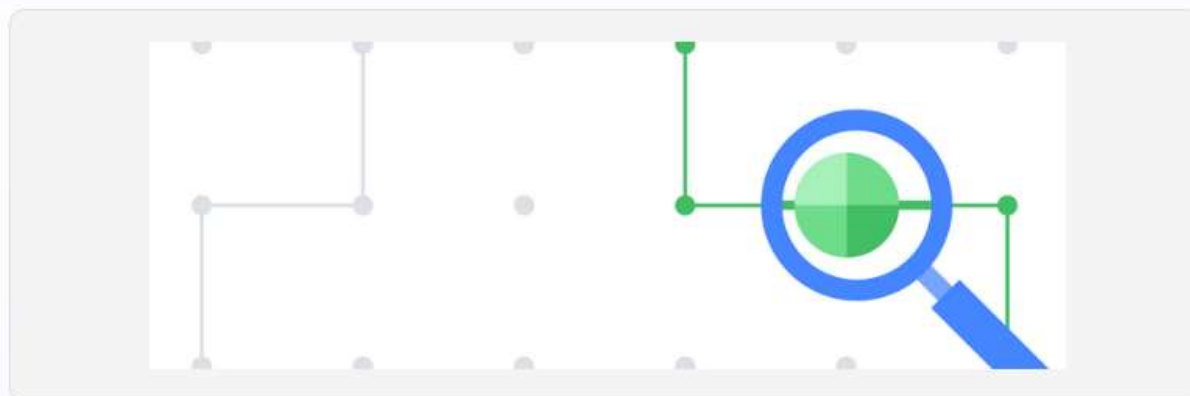
New chat +



Nutrition Expert 02:27 PM

Welcome to Nutrition Expert

Personalized AI nutritionist providing dynamic meal plans, dietary advice, and food analysis.



Type something...



RESULTS



You 02:32 PM

I'm lactose intolerant—suggest high-protein breakfast options.



Nutrition Expert 02:32 PM

High-Protein Breakfast Options for Lactose Intolerance

1. Chia Seed Pudding with Almond Milk

- **Ingredients:** Chia seeds, almond milk, maple syrup, fresh berries.
- **Nutritional Justification:** Chia seeds are high in protein, fiber, and omega-3 fatty acids. Almond milk is a lactose-free alternative rich in calcium.
- **Allergen Note:** ⚠️ Contains nuts.
- **Adaptive Swap:** Use coconut milk for a nut-free version.

2. Tofu Scramble with Spinach

- **Ingredients:** Tofu, spinach, turmeric, garlic, olive oil.
- **Nutritional Justification:** Tofu is a great source of plant-based protein. Spinach is rich in iron and vitamins.
- **Allergen Note:** ⚠️ Contains soy.
- **Adaptive Swap:** Use chickpeas instead of tofu for a soy-free option.

3. Quinoa Breakfast Bowl

- **Ingredients:** Quinoa, almond milk, mixed berries, honey, cinnamon.
- **Nutritional Justification:** Quinoa is a complete protein and high in fiber. Berries provide antioxidants.

RESULTS



You 02:44 PM

Help me create a personalized meal plan introduction for a client with type 2 diabetes.



Nutrition Expert 02:44 PM

Personalized Meal Plan Introduction for Type 2 Diabetes

Introduction

Welcome to your personalized meal plan designed to help manage type 2 diabetes effectively. This plan focuses on maintaining balanced blood sugar levels, promoting weight management, and ensuring overall health. Each meal is carefully crafted to provide essential nutrients while considering your dietary preferences and restrictions.

Key Considerations

1. Balanced Macronutrients:

- **Proteins:** Essential for muscle health and satiety.
- **Carbohydrates:** Focus on complex carbs for sustained energy.
- **Fats:** Include healthy fats for heart health and satiety.

2. Essential Micronutrients:

RESULTS

Deployed AI Agent

The screenshot displays the IBM Watsonx interface for a deployed AI agent named "Nutrition Expert". The top navigation bar includes the IBM Watsonx logo, an "Upgrade" button, a help icon, a notification bell, and user account information for "Adithyashkrishnan P N's Acc..." with a location dropdown set to "London". The breadcrumb trail shows the path: "Deployment spaces / Nutrition Agent / Nutrition Expert".

Below the navigation, the agent's name "Nutrition Expert" is shown with status indicators "Deployed" and "Online". A tabbed interface at the bottom of this section includes "API reference", "Test", and "Preview", with "Preview" being the active tab. A "New chat" button is located on the right side.

The chat window shows a conversation where the user asks for a nutrition guide for pregnant women. The AI agent responds with a detailed "Nutrition Guide for Pregnant Women", explaining the importance of proper nutrition and providing specific guidelines for Folic Acid and Iron.

You 02:50 PM
Give me a nutrition guide for pregnant women

Nutrition Expert 02:50 PM
Nutrition Guide for Pregnant Women
Pregnancy is a crucial time for both the mother and the developing baby. Proper nutrition plays a vital role in ensuring the health and well-being of both. Here are some key nutritional guidelines for pregnant women:

- 1. Folic Acid**
 - **Importance:** Essential for preventing neural tube defects in the baby.
 - **Sources:** Leafy greens, citrus fruits, fortified cereals, and prenatal vitamins.
- 2. Iron**

Type something...

CONCLUSION

- The Nutrition Agent generates **personalized meal plans**, explains nutritional choices, and adapts to user feedback in real-time.
- It saves time by **automating diet analysis** and replacing generic meal apps with AI-powered customization.
- This AI assistant bridges the gap between **one-size-fits-all diet tools** and **human nutritionists**, delivering scalable, science-backed dietary guidance.

FUTURE SCOPE

- **Multilingual Nutrition Support** (Hindi, Spanish, etc. for diverse users)
- **Voice-Activated Meal Logging** ("Add today's lunch: grilled chicken salad")
- **Real-Time Health Data Sync** (Fitbit/Apple Health integration)
- **Personalized Nutrient Gap Analysis** (identifies vitamin/mineral deficiencies)
- **Grocery Delivery API Integration** (orders suggested foods automatically)
- **AI-Assisted Diet Journaling** (auto-generates progress reports)

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Adithyakrishnan P N

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



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IBM **SkillsBuild**

Completion Certificate



This certificate is presented to
Adithyakrishnan P N

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

GITHUB LINK

- https://github.com/adithyakrish0/AI_Nutrition_Expert



THANK YOU