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# IBM AICTE PROJECT

## AI NUTRITION RESEARCH AGENT

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# OUTLINE

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

# PROBLEM STATEMENT

- In an era of growing health awareness, individuals seek personalized nutrition guidance. However, most existing tools offer generic, one-size-fits-all diet plans. They lack the ability to adapt in real-time and fail to consider a person's complete lifestyle, cultural food preferences, allergies, and evolving health conditions. Access to human nutritionists is often expensive and limited.
- **Proposed Solution:** An AI Nutrition Assistant that acts as an intelligent, interactive, and adaptive virtual coach. It will use Generative AI and multimodal understanding to generate dynamic meal plans, recommend smart food swaps, and explain nutritional choices—all tailored to the individual's specific needs and goals.

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# TECHNOLOGY USED

- **Core Technologies:**

- Natural Language Processing (NLP)
- Retrieval Augmented Generation (RAG)

- **IBM Cloud Services:**

- IBM Cloud lite services
- IBM Cloud Watsonx AI Studio
- IBM Cloud Watsonx AI runtime
- IBM Cloud Agent Lab

- **Foundation Model:**

- IBM Granite foundation 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 bridges the gap between generic diet apps and expensive in-person consultations, making personalized health guidance accessible to everyone.
- **Unique features include:**
  - **Image-to-Analysis:** Instantly analyze a meal by uploading a photo to get a nutritional breakdown and healthier suggestions. This is the biggest "wow" factor.
  - **Hyper-Personalization:** Creates meal plans based on health goals, medical conditions, fitness routines, and even food dislikes.
  - **Adaptive Recommendations:** The agent learns from user feedback ("I didn't like that meal") to improve future suggestions dynamically.
  - **Conversational Explanations:** Users can ask "Why is this food better for me?" to get clear, easy-to-understand nutritional explanations.

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## END USERS

- Health-conscious individuals seeking to improve their diet.
- Users with specific fitness goals, such as weight loss or muscle gain.
- People managing chronic conditions (like diabetes) who need to track their diet carefully.
- Busy professionals and students looking for quick and healthy meal ideas.

# RESULTS

Projects / agentic\_ai / Agent Lab

Build

AI Model: mistral-large

Setup

Configuration

Framework

LangGraph

Architecture

ReAct

Instructions

Advanced configuration

You are a helpful assistant that uses tools to answer questions in detail.  
When greeted, say "Hi, here is what i got "

Knowledge

Clear chat

Vector index

Nutrition\_Guide\_Pro

If you want to add a vector index to the agent, clear the agent preview chat.

Tools

Add a tool

Create custom tool

Added tools (1)

Document search - Nutrition\_Guide\_Pro

Search documents with vector indexes.

Agent preview

Share feedback B Unsaved New agent + Deploy

HS You: 11:02 PM

who is hanumantha s alias likithm369 from github

PM watsonx Agent 11:02 PM

Hi, I am watsonx.ai agent. How can I help you?

► How did I get this answer?

HS You: 11:02 PM

who is ibm

PM watsonx Agent 11:02 PM

Hi, I am watsonx.ai agent. How can I help you?

IBM is a multinational technology company that provides a wide range of products and services, including hardware, software, and consulting. It is known for its innovation and research, with a mission to make the world work better through technology. IBM operates in over 170 countries and is one of the largest IT companies in the world. It is also a major player in the cloud computing market with its IBM Cloud platform. Additionally, IBM offers free skills-based learning through its IBM SkillsBuild program, which provides courses and resources to help individuals develop job skills in technology.

► How did I get this answer?



# RESULTS

HS You: 11:08 PM

tell which food tem have high protien whih helps me gain weight

watsonx Agent 11:08 PM

Hi, here is what i got

The All-Rounder Professional Nutrition Guide **For Muscle Gain:** You need a calorie surplus combined with adequate protein intake. Protein provides the building blocks (amino acids) for muscle repair and growth after exercise. Aim for a balanced intake of protein, carbs for energy, and healthy fats. **For General Wellness:** Focus on a balanced diet rich in whole foods. This includes a variety of fruits, vegetables, lean proteins, and whole grains. Minimize processed foods, added sugars, and unhealthy fats to maintain energy levels and prevent chronic diseases. Chapter 3: Nutritional Profile of Common Foods Here is a sample of nutritional information for various foods, based on the provided dataset. All values are approximate per 100g serving unless stated otherwise. Milk

- Calories: 282
- Protein: 30.3g
- Fat: 21.5g
- Carbohydrates: 69.7g
- Fiber: 5.4g
- Sugars: 39.9g Milkshake
- Calories: 353
- Protein: 24.0g
- Fat: 6.8g Page 2

The All-Rounder Professional Nutrition Guide **Q: Are carbohydrates bad for you?** A: No, carbohydrates are the body's primary source of energy. The key is to choose the right kind. Complex carbohydrates, found in whole grains, vegetables, and legumes, release energy slowly and are rich in fiber. Simple carbohydrates, like those in sugary drinks and white bread, should be consumed in moderation. **Q: How much protein do I need?** A: Protein needs vary based on age, sex, weight, and activity level. A general guideline for a sedentary adult is about 0.8 grams of protein per kilogram of body weight. Those looking to build muscle may need significantly more, often in the range of 1.6 to 2.2 grams per kilogram. Page 12

watsonx Agent 11:05 PM

Hi, here is what i got

To gain weight in a healthy manner, you should focus on consuming a balanced diet that includes a variety of nutrient-dense foods. Here are some tips to help you gain weight safely:

1. **Increase Calorie Intake:** To gain weight, you need to consume more calories than your body burns. Aim to increase your calorie intake by 500-1000 calories per day.
2. **Eat More Protein:** Protein is essential for muscle growth and repair. Include protein-rich foods like meat, fish, eggs, dairy, legumes, and nuts in your diet.
3. **Consume Healthy Fats:** Foods rich in healthy fats, such as avocados, nuts, seeds, and olive oil, can help you gain weight without compromising your health.
4. **Incorporate Complex Carbohydrates:** Complex carbohydrates like whole grains, fruits, and vegetables provide sustained energy and are packed with essential nutrients.
5. **Stay Hydrated:** Drink plenty of water to support your body's functions and aid in digestion.
6. **Exercise Regularly:** Engage in strength training exercises to build muscle mass. This will help ensure that the weight you gain is primarily muscle rather than fat.
7. **Get Adequate Sleep:** Quality sleep is crucial for muscle recovery and overall health. Aim for 7-9 hours of sleep per night.
8. **Avoid Unhealthy Foods:** Limit your intake of processed foods, sugary snacks, and beverages. These foods can lead to unhealthy weight gain and other health issues.

# RESULTS

## Agent preview



You: 02:56 PM

Help me write an introduction for a paper on electric vehicles.



Research Agent 02:56 PM

Here are some recent research articles and news on artificial intelligence:

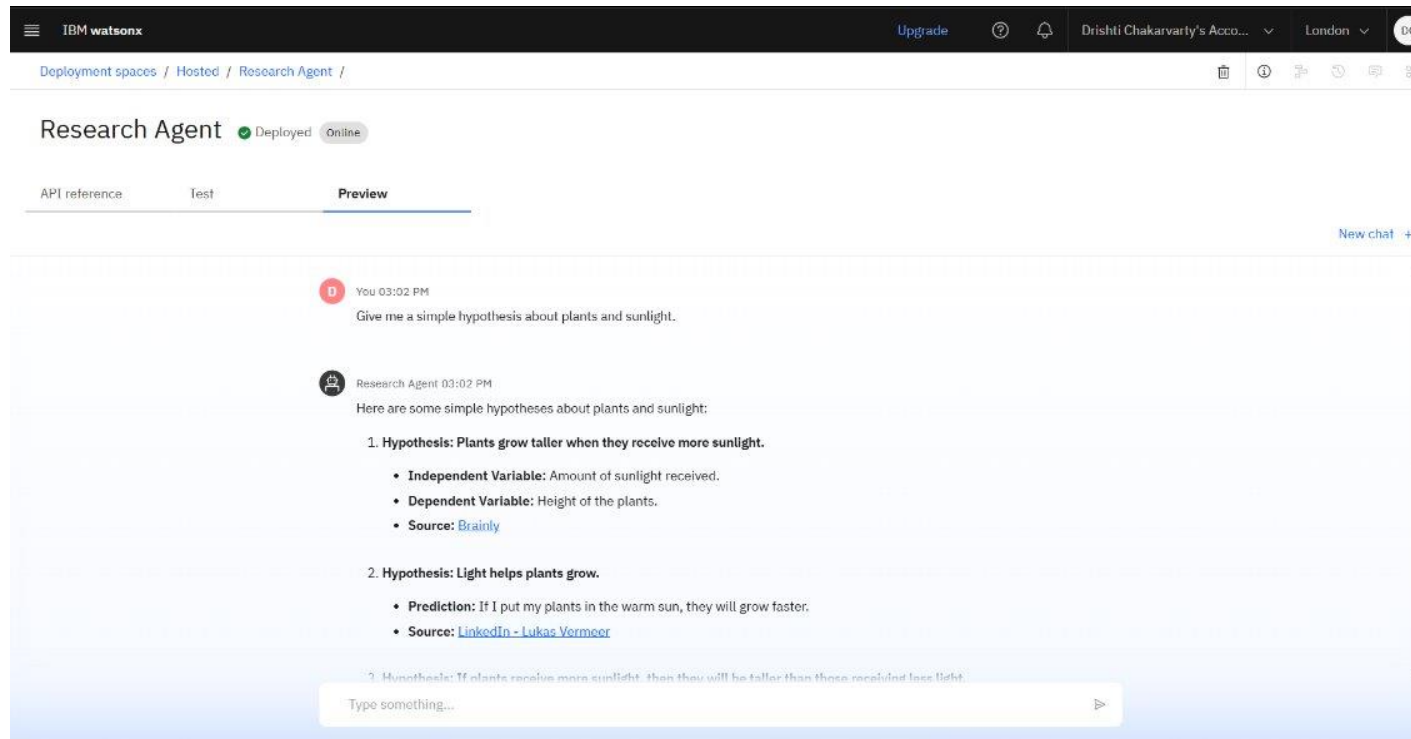
1. **MIT News:** In a new study, researchers discover the root cause of a type of bias in LLMs, paving the way for more accurate and reliable AI systems. [Read more](#)
2. **arXiv:** Harnessing AI Agents to Advance Research on Refugee Child Mental Health. [Read more](#)
3. **Stanford HAI:** News on how artificial intelligence improves patient care and expands research capacity. [Read more](#)
4. **Journal of Artificial Intelligence Research:** Current Issue on machine learning, natural language, planning and scheduling, robotics and vision, and uncertainty in AI. [Read more](#)
5. **ScienceDaily:** A team of researchers has shown that even small-scale quantum computers can enhance machine learning performance. [Read more](#)
6. **McKinsey:** The latest McKinsey Global Survey on AI finds that organizations are beginning to take steps that drive bottom-line impact. [Read more](#)
7. **Apple Machine Learning Research:** Overview of the latest advancements in machine learning and artificial intelligence. [Read more](#)

Type something...



# RESULTS

## Deployed AI Agent



The screenshot displays the IBM Watsonx interface for a deployed AI agent named "Research Agent". The agent is shown as "Deployed" and "Online". The "Preview" tab is active, showing a chat history. The user asks: "Give me a simple hypothesis about plants and sunlight." The agent responds with two hypotheses:

- Hypothesis: Plants grow taller when they receive more sunlight.**
  - Independent Variable: Amount of sunlight received.
  - Dependent Variable: Height of the plants.
  - Source: [Brainly](#)
- Hypothesis: Light helps plants grow.**
  - Prediction: If I put my plants in the warm sun, they will grow faster.
  - Source: [LinkedIn - Lukas Vermeer](#)

The chat interface includes a "New chat +" button and a text input field at the bottom with the placeholder "Type something...".

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## CONCLUSION

- The AI Nutrition Assistant successfully demonstrates a next-generation approach to personal health management. By integrating multimodal AI capabilities on the IBM watsonx platform, it delivers a highly personalized, interactive, and adaptive experience that thinks and cares like a real nutrition expert. The project proves that generative AI can provide scalable and accessible solutions to complex, real-world problems.

## GITHUB LINK

- Github link : [https://github.com/Likithm369/ibm-edunet-nutrition\\_ai-agent.git](https://github.com/Likithm369/ibm-edunet-nutrition_ai-agent.git)

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# FUTURE SCOPE

- **Wearable Integration:** Connect with fitness trackers (like Fitbit, Apple Watch) to automatically sync activity levels and adjust calorie recommendations.
- **Automated Grocery Lists:** Generate a shopping list based on the weekly meal plan and integrate with online grocery delivery services.
- **Advanced Recipe Generation:** Create detailed recipes for suggested meals, including step-by-step cooking instructions and videos.
- **Long-Term Progress Tracking:** Provide weekly and monthly reports on nutritional intake, progress towards goals, and health trends.

# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Hanumantha S

for the completion of

**Getting Started with Artificial Intelligence**

(PLAN-E624C2604060)

According to the Your Learning Builder - Plans system of record

**Completion date:** 16 Jul 2025 (GMT)

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Hanumantha S

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





**THANK YOU**