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# **CAPSTONE PROJECT**

## **NUTRITION AI AGENT**

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**Technology and Science | Computer Science & Engineering**

# OUTLINE

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

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# PROBLEM STATEMENT

In the current landscape, generic diet apps and time-constrained nutritionists leave a critical void. Millions of people are searching for a true "health companion" that understands their unique body, lifestyle, and goals, not just a static database. The growing problem is the disconnect between the desire for personalized wellness and the inability of existing solutions to provide it with intelligence and empathy.

## Proposed Solution:

Our project addresses this with a groundbreaking Generative AI approach. Instead of a rigid app, we're building an adaptive AI agent that acts as a personal nutritionist. It not only generates tailored meal plans but also learns from your feedback, explains its choices, and understands your health story through natural language, input text . We're not just providing information; we're creating a dynamic partnership for better health.

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# TECHNOLOGY USED

IBM cloud lite services

Natural Language Processing (NLP)

IBM Granite model

Cloudant DB for user/feedback storage

Watsonx Agent Lab for building interactive agent logic

IBM Watson Studio with Python backend notebooks

## IBM CLOUD SERVICES USED

- IBM Watsonx.ai Studio→ For writing and running notebooks and AI prompts.
- IBM Watsonx.ai Runtime→ Powers and executes Python tools and AI logic.
- IBM Watsonx Agent Lab→ To build the smart Nutrition AI Agent that uses tools + LLM.
- IBM Granite Foundation Model→ The brain behind meal plan generation and explanations.
- IBM Cloudant NoSQL DB→ To store user feedback and meal data securely.
- IBM Cloud Object Storage→ To upload food guidelines and use them in the AI knowledge base.

# WOW FACTORS

This AI Nutrition Agent transforms generic diet tools into truly personalized wellness companions—generating expert meal plans in seconds, adapting to real-time feedback, and empowering users across cultures, lifestyles, and health conditions. This AI combines the reasoning of a doctor, the planning of a dietitian, and the speed of generative AI—offering 24/7 support that adapts with user feedback.

Unique features:

- Highly personalized meal plans
- Real-time feedback adaptation
- Cultural and medical condition awareness
- Semantic food swap suggestions
- Doctor + Dietician + AI = Super Nutrition Assistant
- Modular and expandable design

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## END USERS


- Individuals with specific dietary needs (e.g., PCOS, Diabetes)
- Fitness enthusiasts and athletes
- Nutritionists and dieticians
- Health-tech startups
- Hospitals and wellness centers

# RESULTS

[Upgrade](#) ⓘ 🔔 Varshitha Nethi's Account ▾ Dallas ▾ VN

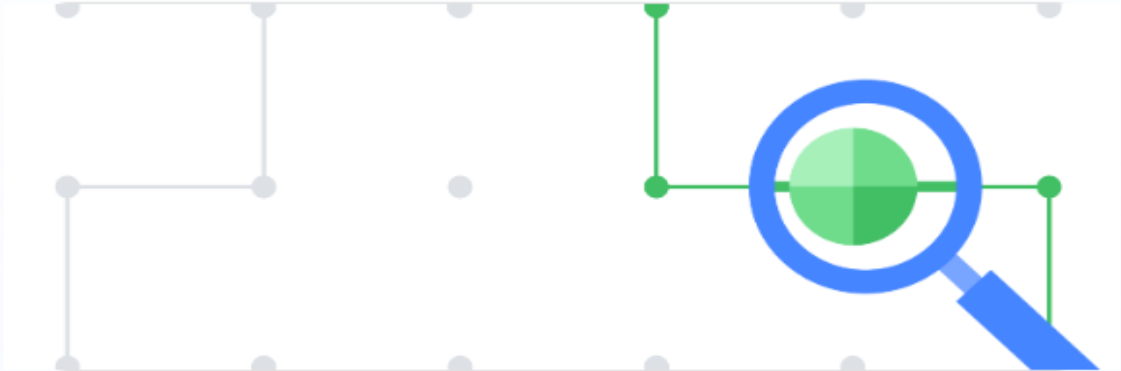
β ☒ Autosaved 11:13 PM 📁 ▾ [New agent +](#) **Deploy** 🔗 🔒 ⓘ

< Agent preview

 Nutrition Agent 11:13 PM

## Welcome to Nutrition Agent

Hi I'm Nutrition Agent –I create meal plans, analyze food photos, suggest healthy swaps, adapt you



### Sample questions

1. "Create a 7-day meal plan"

3. "I'm diabetic and need"

Type something... 🔍 ➤



# RESULTS

## Agent preview



You: 10:18 PM

1. "Create a 7-day meal plan for weight loss with Indian vegetarian cuisine"



Nutrition Agent 10:18 PM

Hi there! I'm your Nutrition Assistant. I'd be happy to help you create a 7-day meal plan for weight loss with Indian vegetarian cuisine. To make this plan as effective as possible, could you please share your daily calorie target, any dietary restrictions, and your preferred meal times?

In the meantime, here's a general outline of what a day might look like:

### Day 1:

- **Breakfast:** Masala Oats (1 cup cooked oats with mixed vegetables and spices)
- **Snack:** A small handful of roasted chickpeas
- **Lunch:** Chana Masala (spicy chickpeas in tomato sauce) with brown rice
- **Snack:** Sliced cucumber with hummus

|Type something...



# RESULTS

## Agent preview

### Day 3:

- **Breakfast:** Poha (flattened rice cooked with peanuts and vegetables)
- **Snack:** Carrot sticks with yogurt dip
- **Lunch:** Paneer Tikka (grilled paneer in yogurt and spices) with whole wheat naan
- **Snack:** A banana
- **Dinner:** Aloo Gobi (potato and cauliflower curry) with quinoa

### Day 4:

- **Breakfast:** Upma (semolina roasted with mixed vegetables)
- **Snack:** A handful of almonds
- **Lunch:** Dal Makhani (whole lentils in creamy gravy) with brown rice
- **Snack:** Cucumber slices with mint chutney
- **Dinner:** Methi Thepla (fenugreek-flavored flatbread) with mixed vegetable curry

### Day 5:

|Type something...



# RESULTS

## Agent preview



You: 11:37 PM

4. "Help me plan pre and post-workout meals for muscle building"



Nutrition Agent 11:37 PM

Hi there! I'm your Nutrition Assistant. I'd be happy to help you plan pre and post-workout meals for muscle building. To give you the best advice, could you please tell me a bit more about yourself?

1. What is your current weight, height, and age?
2. Do you have any dietary restrictions or allergies?
3. What's your typical daily routine like?
4. How often do you work out, and what types of exercises do you do?
5. Do you follow any specific diet, like vegetarian, vegan, or paleo?

With this information, I can create a personalized meal plan for you. Remember, it's also important to maintain a consistent workout routine and ensure you're getting enough rest for muscle recovery and growth.

Type something...



# RESULTS

## Agent preview

Current Weight: 58 kg Height: 162 cm Age:23 Dietary Restrictions / Allergies: Lactose intolerant, avoids soy, allergic to peanuts. Typical Daily Routine: Works a 9-to-5 desk job with moderate walking breaks. Sleeps by 11 PM and wakes up at 7 AM. Eats three meals a day and prefers light evening snacks. Workout Routine: Exercises 4 days a week:

- 2 days strength training
- 2 days yoga/stretching Vegetarian (no eggs), prefers Indian cuisine, avoids fried foods, likes home-cooked meals.



Nutrition Agent 11:47 PM

Hi! Thanks for providing all the details. It's great to see you're committed to a healthy lifestyle. Here's a pre and post-workout meal plan tailored to your needs:

### Pre-Workout Meal (1 hour before exercise):

- **Chickpea Salad**
  - Ingredients: Mixed greens, chickpeas (great source of plant-based protein), cherry tomatoes, cucumber, red onion, lemon-tahini dressing.
  - This meal is rich in carbohydrates from the vegetables for energy and protein from chickpeas to support muscle maintenance during your

Type something...



# RESULTS

## Agent preview

- This meal is rich in carbohydrates from the vegetables for energy and protein from chickpeas to support muscle maintenance during your workout.

### Post-Workout Meal (within 45 minutes after exercise):

- **Quinoa and Vegetable Stir-Fry**
  - Ingredients: Cooked quinoa, mixed vegetables (broccoli, bell peppers, carrots), tofu (ensure it's not made with soy), seasoned with turmeric, cumin, and coriander.
  - Quinoa is a complete protein and complex carbohydrate, ideal for muscle recovery and glycogen replenishment. Tofu provides additional protein without soy.

### Snack (if needed between meals):


- **Greek Yogurt with Berries and Flaxseeds**
  - Replace Greek yogurt with a lactose-free alternative if needed. Berries provide antioxidants and carbohydrates, while flaxseeds add healthy fats and fiber.


Type something...





# RESULTS


## Deployed AI Agent

 IBM watsonx

Upgrade ? 

Varshitha Nethi's Account 

Dallas 

VN 

Deployment spaces / Nutrition Deployment / Nutrition Agent /      

### Nutrition Agent

 Deployed OnlineAPI reference Test **Preview**

New chat +

 You 11:32 PM

3. "I'm diabetic and need low-carb meal ideas that are family-friendly"

 Nutrition Agent 11:32 PM

Hi there! I'm your Nutrition Assistant, and I'm here to help you with your dietary needs. As a diabetic, it's important to manage your carbohydrate intake, so I'll provide you with some low-carb, family-friendly meal ideas.

- Grilled Chicken with Cauliflower Rice:** Marinate chicken breasts in lemon juice, olive oil, garlic, salt, and pepper. Grill until fully cooked. Serve with cauliflower rice sautéed in olive oil, butter, garlic, salt, and pepper. This meal is low in carbs and high in protein, which is beneficial for blood sugar control.
- Stuffed Bell Peppers:** Use bell peppers as the base and stuff them with a mixture of ground turkey, onions, tomatoes,

Type something... 

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## CONCLUSION

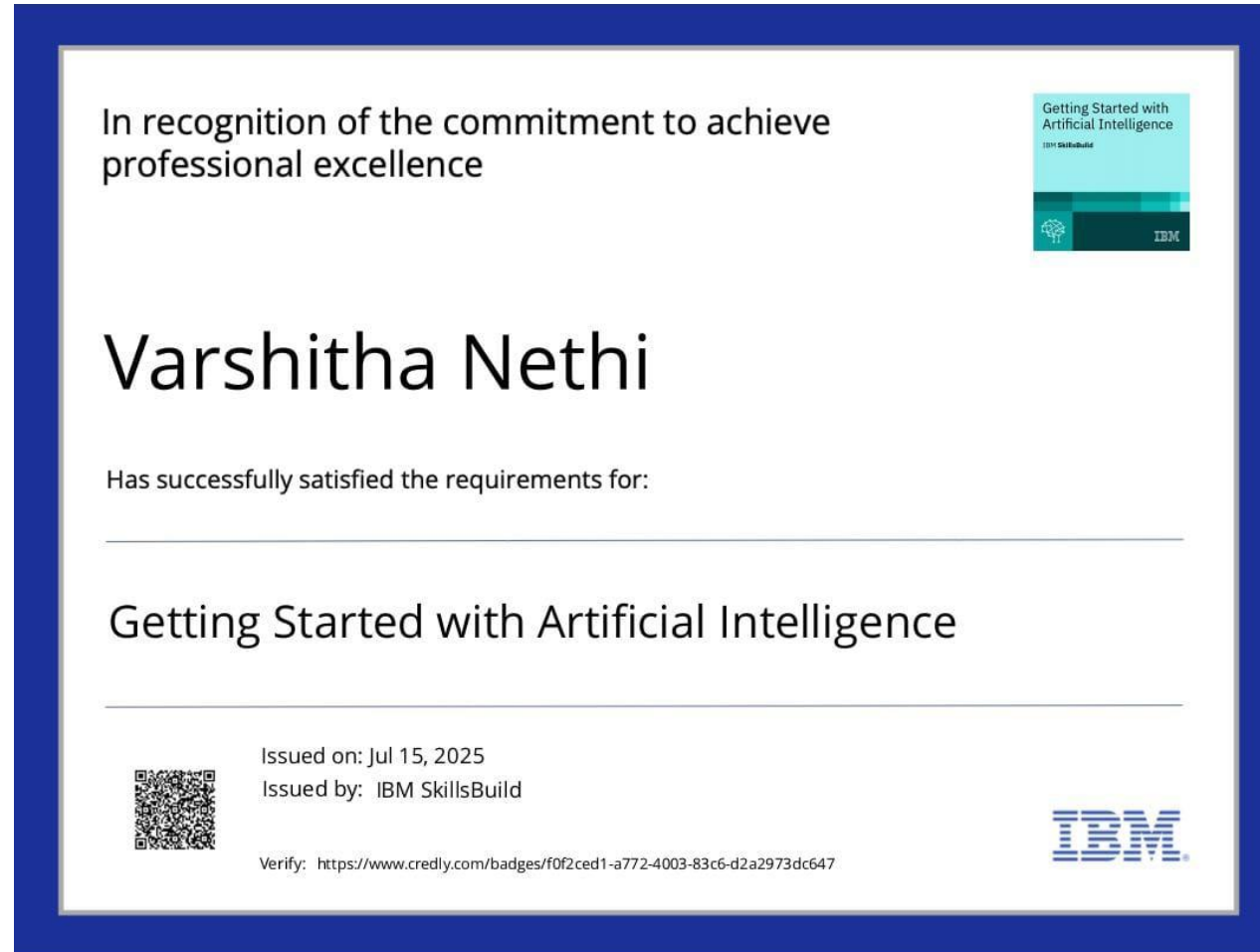
- Our AI-powered Nutrition Agent, built fully on IBM Cloud & Watsonx, redefines wellness by delivering empathetic, adaptive, and explainable guidance—just like a real nutritionist would.
- It saves time for both users and professionals by automating personalized guidance.
- It enhances health outcomes and accessibility to nutrition expertise.
- Understands the user's goals, learns from feedback, explains its reasoning and evolves with every interaction

# FUTURE SCOPE

- Multilingual Support
- Integration with voice/image input
- Scan grocery labels to detect unhealthy foods
- Connect to fitness wearables
- API for dieticians to plug-in
- Mobile app frontend with IBM Code Engine



# IBM CERTIFICATIONS



## IBM SkillsBuild Completion Certificate



This certificate is presented to

**Nethi Varshitha**

for the completion of

### **Lab: Retrieval Augmented Generation with LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of  
record

**Completion  
date:**

17 Jul 2025  
(GMT)

**Learning  
hours:**

20  
mins

## GITHUB LINK

- <https://github.com/varshithanethi/Nutirtion-Agent-/blob/main/README.md>

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## GITHUB LINK

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



**THANK YOU**