
CAPSTONE PROJECT

NUTRIGENIE – THE SMARTEST AI NUTRITION ASSISTANT

Presented By:

Student Name - Rudrani

College Name - Gurugram University

Department - BTech-CSE(AI)

OUTLINE

- Problem Statement
- Proposed System/Solution
- Technology Used
- WOW Factors
- End Users
- Algorithm & Deployment
- Result
- Conclusion
- GITHUB Link
- Future Scope
- IBM Certifications

PROBLEM STATEMENT

Individuals increasingly seek personalized nutrition guidance tailored to their health goals, lifestyle, and dietary restrictions. Existing apps offer generic plans and lack dynamic adaptability. There is a need for an intelligent assistant that can understand user needs via natural inputs and generate tailored meal suggestions that adapt over time.

PROPOSED SOLUTION

NutriGenie is an AI-powered virtual nutrition assistant that:

- Accepts text, voice, or image input from users
- Understands health goals, allergies, and dietary needs
- Generates personalized meal plans using IBM Granite
- Explains food choices and tracks user preferences over time
- Uses adaptive logic to improve recommendations through feedback

TECHNOLOGY USED

- IBM Cloud Lite
- IBM Watsonx.ai Studio
- IBM Granite (LLM)
- IBM Cloudant (NoSQL DB for user data & feedback)
- IBM Watson Speech-to-Text (optional)
- React.js for frontend interface
- Flask (Python) for backend API

WOW FACTORS

- Generates personalized meal plans using IBM Granite based on real user goals and preferences.
- Accepts multimodal input including text, voice, and food images for flexible user interaction.
- Learns from user feedback to continuously improve future diet suggestions.
- Explains nutritional choices like a real dietician using LLM-powered reasoning.
- Visualizes calorie and macro intake with an interactive analytics dashboard.
- Supports diverse dietary needs including diabetic, vegan, and Indian meal patterns.
- Built on IBM Watsonx and Cloudant, ensuring enterprise-grade scalability and reliability.
- Bridges the gap between generic diet apps and expert nutrition counseling.
- Adaptable and inclusive design with potential for multilingual and regional expansion.
- Empowers users to make smarter, healthier food decisions with AI-driven guidance.

END USERS

- Health-conscious individuals seeking personalized diets
- Patients managing conditions like diabetes or hypertension
- Fitness enthusiasts and gym-goers needing goal-based meal plans
- Dietitians and nutritionists looking to scale their services
- Wellness startups integrating smart nutrition tools
- Elderly users or busy professionals needing quick guidance
- Students and beginners learning healthy eating habits

ALGORITHM & DEPLOYMENT

Prompt-based generative response using IBM Granite model.

Prompt Example:

"Create a 2000-calorie vegetarian meal plan for a diabetic Indian male. Exclude sugar and fried food."

Deployment Steps:

1. Built and tested in Watsonx Prompt Lab
2. Integrated with backend via Watsonx API
3. Deployed agent via Watsonx.ai Studio & IBM Cloud

RESULT

IBM watsonx

Upgrade ⓘ ? 🔔 Rudrani.'s Account ▾ Dallas ▾ R. ⋮

Projects / NutriGenie / NutriGenie

Share feedback ⓘ Autosave on 📄 ▾ New agent + Deploy 🔗 🔒 ⓘ

Build

AI Model: granite-3-3-8b-instruct ⌵ ⚙️ <

Setup

Configuration

Framework Architecture

LangGraph ▾ ReAct ▾

Instructions [Advanced configuration](#)

You are a helpful assistant that uses tools to answer questions in detail.
When greeted, say "Hi, I am NutriGenie. How can I help you?"

Knowledge

Tools

Add a tool Create custom tool

Added tools (6)

Google search ⚙️ 🗑️


Retrieve information from the internet with the Google search engine.

Agent preview

NutriGenie 11:06 PM

Welcome to NutriGenie

Assistant that generates personalized meal plans using IBM Granite based on user goals and feedback.



Sample questions

Create a 1500-calorie vegetarian meal plan for weight loss. →


Can you make a meal plan without dairy or eggs? →

Which foods help reduce cholesterol? →







I didn't like tofu. Can you suggest an alternative? →


Type something... 🔍 ➤

RESULT

 IBM watsonx


Upgrade ? 🔔 Rudrani 's Account Dallas R. ☰

Deployment spaces / NutriGenie / NutriGenie /      


NutriGenie  Deployed Online

API reference Test **Preview**


New chat +

 You 11:09 PM


hi

 NutriGenie 11:09 PM

Hi, I am NutriGenie. How can I help you?


 You 11:09 PM

Which foods help reduce cholesterol?

 NutriGenie 11:09 PM

To help reduce cholesterol, consider incorporating the following foods into your diet:

- Soluble Fiber:** Foods rich in soluble fiber, such as oats, barley, psyllium, beans, lentils, peas, apples, citrus fruits, and carrots, can help lower cholesterol levels. Soluble fiber binds to bile acids in the digestive system and carries them out of the body, which can lower cholesterol levels.
- Plant Sterols and Stanols:** These substances, found in foods like margarine, spreads, orange juice, and yogurt drinks, can



RESULT

IBM watsonx

Upgrade ? 🔔 Rudrani .'s Account ▾ Dallas ▾ R. ⋮

Deployment spaces / NutriGenie / NutriGenie /

NutriGenie ✔ Deployed Online

API reference Test **Preview**

New chat +

2. **Plant Sterols and Stanols:** These substances, found in foods like margarine, spreads, orange juice, and yogurt drinks, can help block the absorption of cholesterol in the gut.

3. **Nuts:** Almonds, walnuts, pecans, and other nuts contain monounsaturated fats and plant sterols, which can help lower LDL cholesterol.

4. **Fatty Fish:** Salmon, mackerel, tuna, and sardines are high in omega-3 fatty acids, which can increase HDL (good) cholesterol levels.

5. **Avocados:** They are high in monounsaturated fats and can help raise HDL (good) cholesterol.

6. **Olive Oil:** This oil is rich in monounsaturated fats, which can help lower LDL (bad) cholesterol.

7. **Fruits and Vegetables:** Non-starchy fruits and vegetables are high in fiber and low in calories, making them a great choice for a cholesterol-lowering diet.

8. **Whole Grains:** Whole grains like barley, oats, and brown rice contain soluble fiber, which can help lower cholesterol.

9. **Soy:** Soy protein, found in tofu, edamame, and soy milk, can help lower LDL cholesterol.

10. **Dark Chocolate:** In moderation, dark chocolate can help lower cholesterol. It contains flavonoids, antioxidants that can increase HDL (good) cholesterol and improve overall heart health.

Type something...

▶

RESULT

The screenshot displays the IBM Watsonx Data Platform interface. The browser address bar shows the URL: `datapatform.cloud.ibm.com/ml-runtime/spaces/37122ed2-2c9a-4a00-93ce-672f89b08d99/overview?context=wx`. The page title is "NutriGenie". The navigation bar includes "Overview" (selected), "Assets", "Deployments", "Jobs", and "Manage".

Jump back in

- NutriGenie 58 minutes ago
- WeekOnDASH 58 minutes ago
- PDF WeekOnDASH.pdf 58 minutes ago

[View all \(3\)](#)

Deployments All ▾

| Deployed | Failed |
|----------|--------|
| 1 | 0 |

[View deployments](#)

Job runs

| Active | Failed last 24 hours ▾ |
|--------|------------------------|
| 0 | 0 |

[View jobs](#)

Space history ↻

ⓘ No notifications
You will see your most recent notifications here.

CONCLUSION

- NutriGenie bridges the gap between static diet apps and personalized nutrition counseling.
- It delivers customized meal plans using AI, improving user engagement and dietary compliance.
- The system adapts to individual needs, evolving with continuous user feedback.
- IBM Granite enables intelligent, context-aware responses with human-like reasoning.
- The project demonstrates real-world use of Agentic AI for health and wellness.

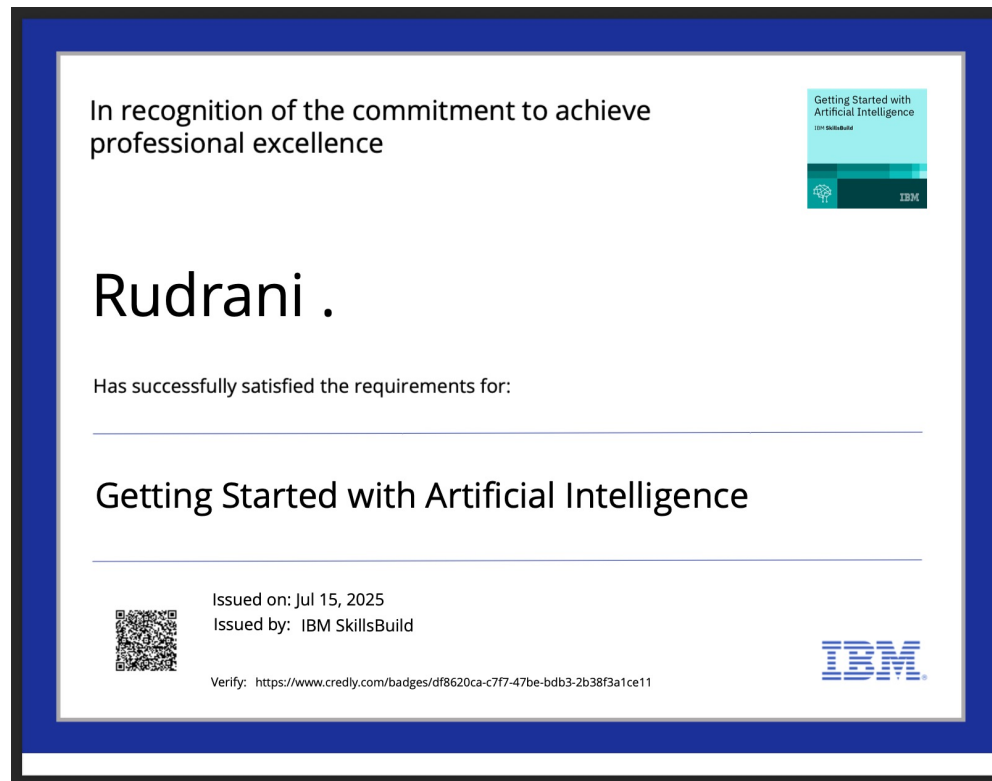
GITHUB LINK

<https://github.com/RudraniSingh100/Nutrigenie-AI-Nutrition-Assistant>

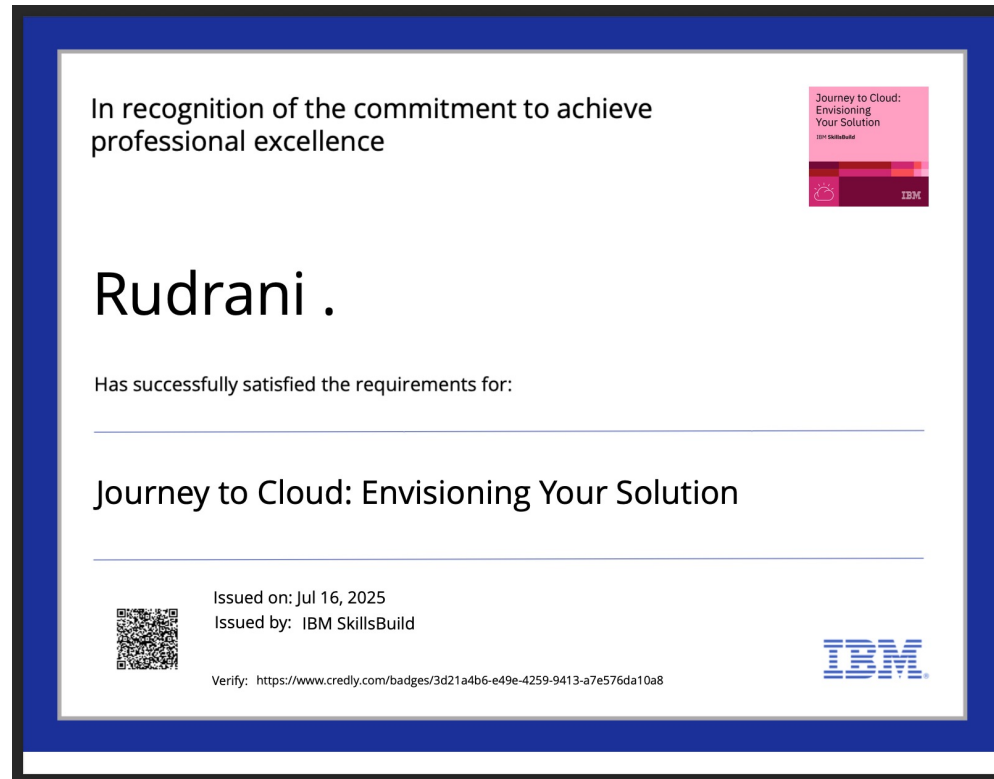
FUTURE SCOPE

- Integration with wearable health trackers (Fitbit, Apple Health)
- Multilingual input/output support
- Real-time nutrition tracking and goal alerts
- Doctor/dietitian collaboration interface

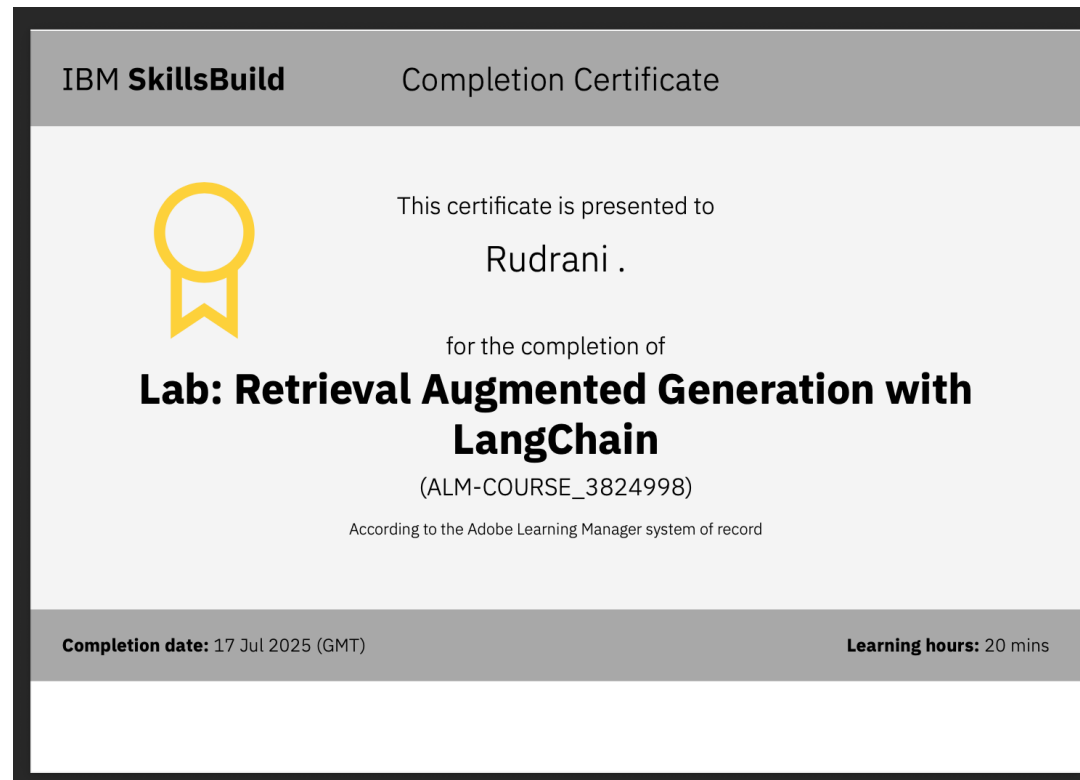
IBM CERTIFICATIONS



IBM CERTIFICATIONS



IBM CERTIFICATIONS





THANK YOU