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# **CAPSTONE PROJECT**

## **NUTRITION AGENT**

### **(THE SMARTEST AI NUTRITION ASSISTANT)**

**Presented By:-**

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**Github link :- <https://github.com/Newcoder-Rudra>**

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# OUTLINE

- **Problem Statement**
- **Proposed System/Solution**
- **System Development Approach**
- **Algorithm & Deployment**
- **Result**
- **Conclusion**
- **Future Scope**
- **References**

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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, 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.**

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# PROPOSED SOLUTION

This project aims to develop **“The Smartest AI Nutrition Assistant”** using state-of-the-art generative AI models that:

- Understand user inputs via text, voice, or image (e.g., food photos, grocery labels)
- Generate personalized meal plans based on health goals, medical conditions, fitness routines, and preferences
- Offer contextual explanations (e.g., “Why is this food better?”)
- Adapt suggestions dynamically with continuous feedback

The system will leverage NLP, multimodal understanding, and large-scale dietary databases to bridge the gap between one-size-fits-all diet apps and in-person counseling.

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# **SYSTEM APPROACH**

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- **IBM Watsonx Assistant** for interactive conversation management
- **Natural Language Processing (NLP)** for understanding user queries
- **Computer Vision** for analyzing food images and grocery labels
- **LLMs (Large Language Models)** for generating contextual explanations and meal suggestions.
- **APIs and Databases:** Integration with health APIs and food databases for personalized planning.
- **Cloud Deployment:** IBM Cloud for hosting and scalability

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# ALGORITHM & DEPLOYMENT

## Algorithm Selection:

- LLMs for contextual understanding and text generation (e.g., GPT or Watson NLP models)
- Rule-based filtering and ranking for allergen detection and food preferences
- Continuous learning via feedback loops

## Data Input:

- User's health data, dietary preferences, allergies, daily routines, and fitness goals
- Images of meals/grocery items
- Real-time interaction via chat/voice

## Training & Prediction Process:

- Models trained on diverse dietary datasets and medical guidelines
- Dynamic suggestion generation based on updated inputs and continuous interactions

## Deployment:

- Deployed as a cloud-hosted interactive agent on IBM Watsonx
- Link: [Nutrition\\_AI\\_Agent](#)

# RESULT

The screenshot shows the IBM watsonx Build interface. On the left, the 'Build' sidebar includes sections for Setup, Configuration (with Framework set to 'LangGraph' and Architecture to 'ReAct'), Instructions (with a sample instruction for a Nutrition Agent), Knowledge, and Tools. The main area is titled 'Agent preview' and shows a conversation between a user and the 'watsonx Agent'. The user asks for a 2-day plan for weight gain. The agent responds with a detailed plan, including calorie goals and food recommendations. A text input field at the bottom is labeled 'Type something...'. The top navigation bar includes 'Upgrade', 'Autosaved 11:52 PM', 'New agent +', and 'Deploy'.

The screenshot shows the IBM watsonx Overview interface for the 'Nutrition Agent' project. The top navigation bar includes 'Upgrade', 'Autosaved 11:52 PM', 'New agent +', and 'Deploy'. The main area is titled 'Start working' and features four recommended actions: 'Add users as collaborators', 'Add data to work with', 'Chat and build prompts with foundation models', and 'Tune a foundation model with labeled data'. Below this, the 'Jump back in' section shows the 'watsonx Agent' was last used 4 minutes ago. The 'Resource usage' section displays metrics for this month: 0 CUH, 15299 Tokens, and 0 Hosting hours. The 'Your documentation' section includes a 'New!' badge and a link to 'Open Documentation editor'. The bottom right corner shows 'Project history'.

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# CONCLUSION

**The Smartest AI Nutrition Assistant demonstrates how generative AI and multimodal input can revolutionize nutrition planning.**

**It bridges the gap between impersonal apps and resource-limited human consultations.**

**By adapting in real-time and offering contextual insights, it provides a comprehensive and personalized nutrition experience.**



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## FUTURE SCOPE

- **Integration with wearable devices for real-time biometrics**
- **Multilingual support**
- **Expanded regional and cultural food databases.**
- **Offline accessibility using edge computing.**
- **Deeper personalization using genetic/nutrigenomics data**

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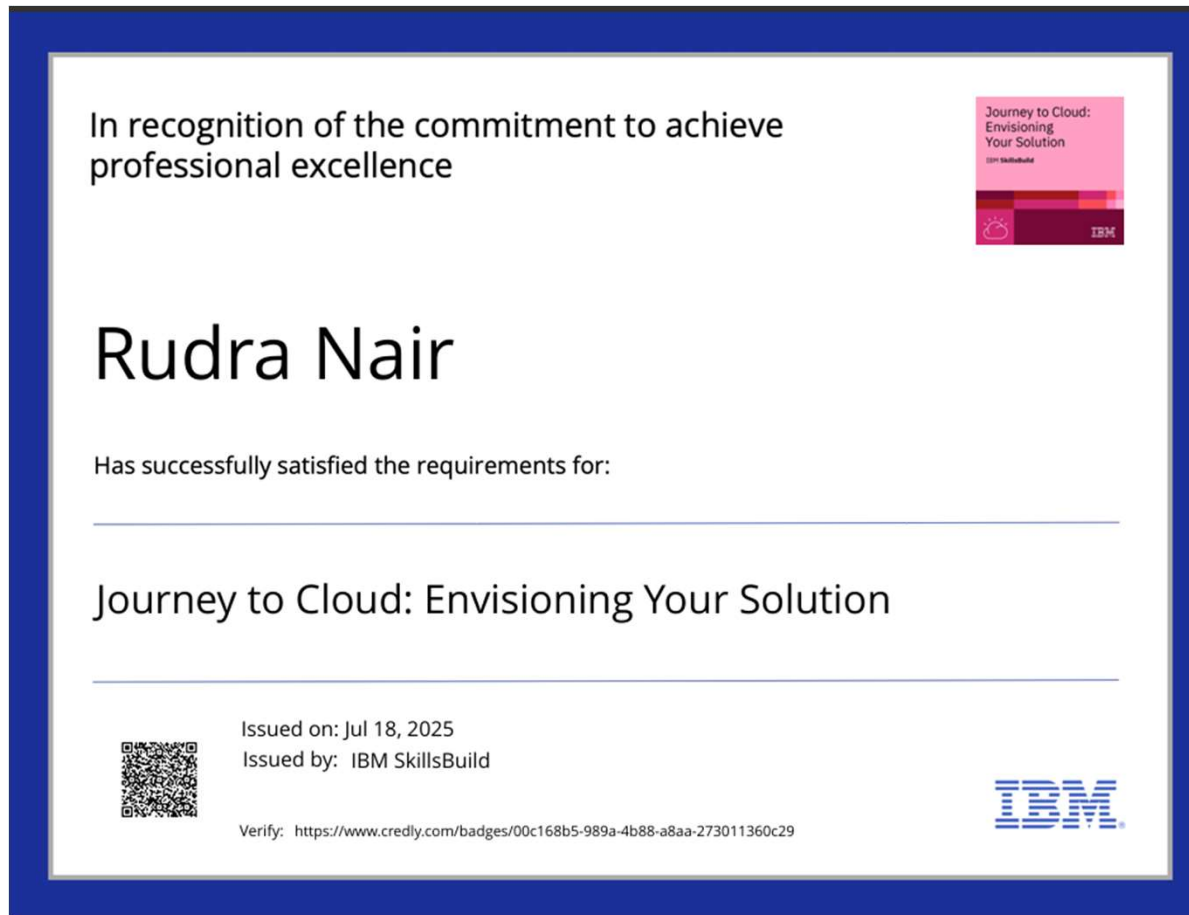
# REFERENCES

- **IBM Watsonx documentation**
- **Research on generative AI in healthcare**
- **NLP-based dietary recommendation papers**
- **Food and nutrition databases (USDA, FDC)**
- **WHO & Indian Nutrition Guidelines**

# IBM CERTIFICATIONS



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# IBM CERTIFICATIONS

**IBM SkillsBuild**

Completion Certificate



This certificate is presented to

Rudra Nair

for the completion of

**Lab: Retrieval Augmented Generation with  
LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

Completion date: 23 Jul 2025 (GMT)

Learning hours: 20 mins

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**THANK YOU**