CAPSTONE PROJECT

THE SMARTEST AI NUTRITION ASSISTANT

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OUTLINE

- Problem Statement
- Proposed System/Solution
- System Development Approach (Technology Used)
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References



PROBLEM STATEMENT

- In an era where health awareness is growing, people seek personalized nutrition advice. However, current solutions offer generic plans, lack adaptability, and fail to consider personal lifestyle, allergies, cultural factors, and evolving health conditions.
- Dieticians face time/resource limits in scaling 1:1 consultations.
- Challenge: Create a scalable, adaptive, and intelligent virtual assistant for nutrition.



PROPOSED SOLUTION

- We propose the development of an Al-driven virtual nutrition assistant that acts as an agent to deliver highly personalized, adaptive, and interactive diet plans tailored to individual needs.
- The Solution Offers:
- A chatbot-based assistant capable of understanding natural language input
- Real-time personalized meal recommendations based on user health data and user measurements.
- Adaptive suggestions that evolve with continuous feedback
- Consideration of medical conditions, allergies, lifestyle, and cultural preferences



SYSTEM APPROACH

The System Approach outlines the overall strategy and methodology used to design, build, and deploy the Smart Al Nutrition Assistant.

- System Requirements:
- IBM Cloud Lite
- IBM Watsonx ai service and Watsonx ai Studio
- Libraries / Tools Used:
- LangGraph to manage conversational flow with memory
- ReAct Architecture for reasoning and acting through the model
- LLaMA-3-2-90B-Vision-Instruct foundation LLM model

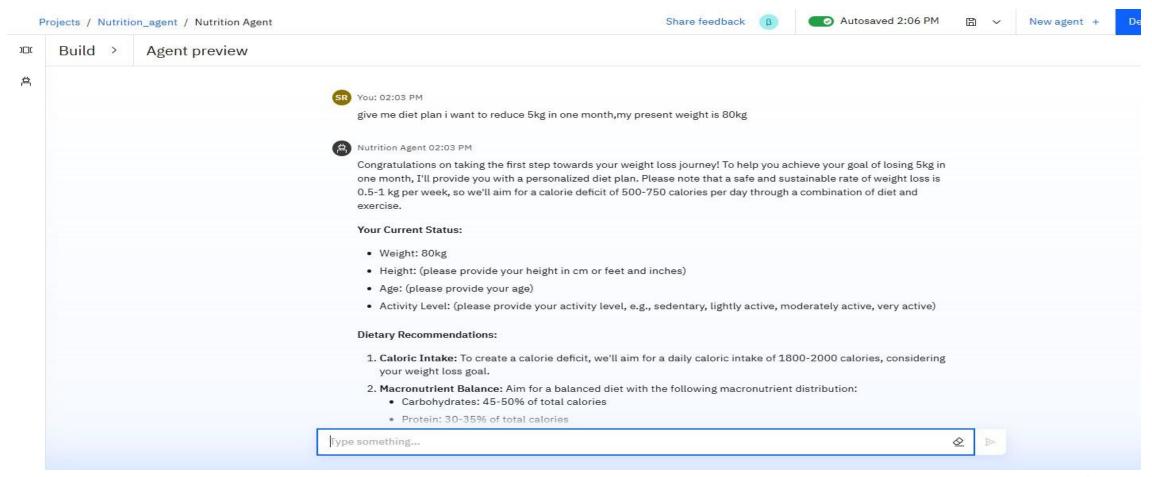


ALGORITHM & DEPLOYMENT

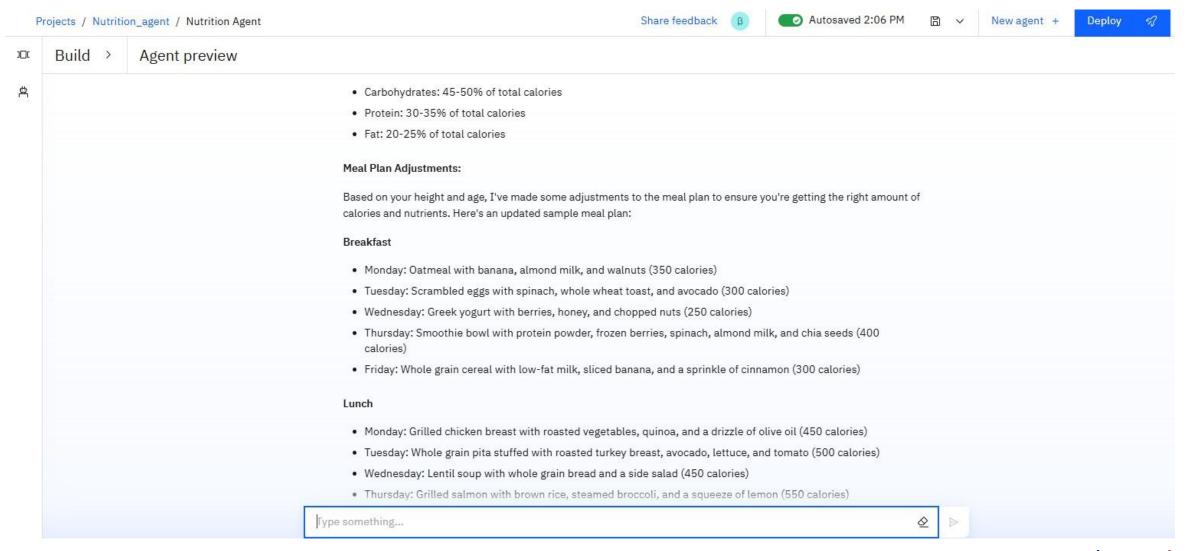
- Algorithm Logic:
- Uses LLM-based reasoning (LLaMA 3 model) to process user inputs
- Extracts context like:
 - Health goals (e.g., weight loss)
 - Lifestyle (e.g., active/sedentary)
 - Dietary restrictions and preferences
- Deployment Strategy:
- Built and tested in Watsonx Al Studio using LLaMA-3-2-90B
- Configured with a token limit of 1000 to manage output length



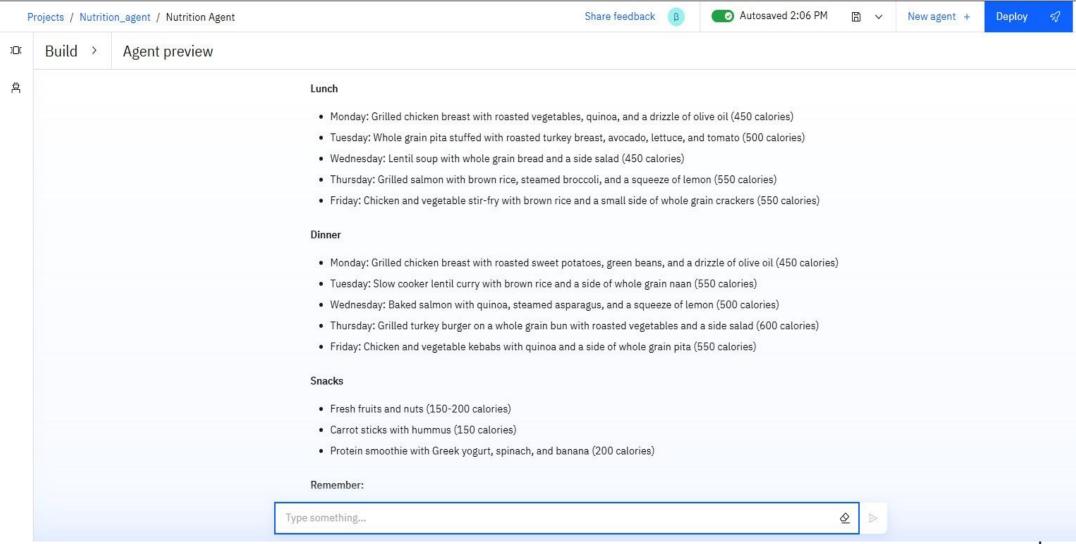
The Smart Al Nutrition Assistant was successfully developed and tested using with the following input: "Give me a diet plan. I want to reduce 5kg in one month. My present weight is 80kg."





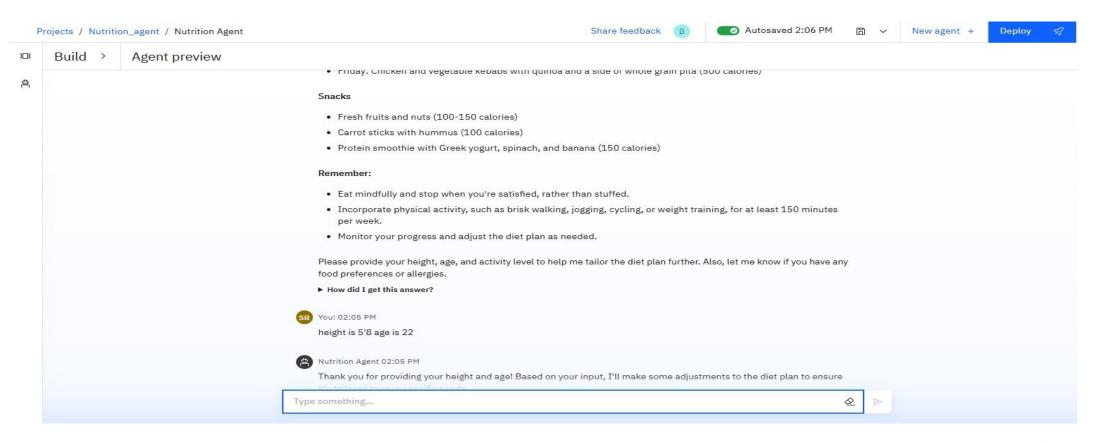








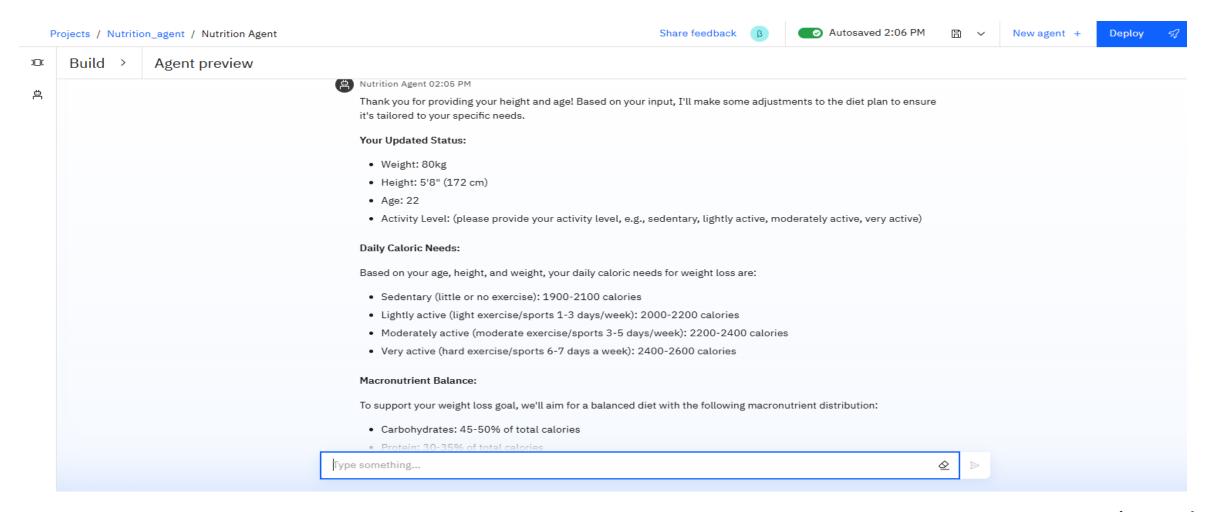
Based on the user's details like height, age, weight, and activity level, the agent calculates the ideal daily calorie intake and generates a personalized meal plan tailored to their health goals, dietary preferences, and lifestyle."





Result

Github Repositoy Link: https://github.com/suneel960/Smart_AI_Nutrition_Assistant





CONCLUSION

- This project demonstrates an Agent Al can:
- Deliver personalized, real-time dietary guidance
- Scale nutritional consulting via virtual assistants
- Integrate user feedback for dynamic improvement
- It bridges the gap between rigid diet apps and real consultations.



FUTURE SCOPE

- Add image recognition for food and nutrition labels
- Integrate wearable health data (e.g., Fitbit, Apple Health)
- Expand multilingual and multicultural support
- Include fitness routine tracking
- Build a mobile version for wider accessibility



REFERENCES

- IBM Watsonx Ai Documentation
- IBM Cloud Lite Services
- Research papers on AI in healthcare and nutrition



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THANK YOU

