CAPSTONE PROJECT

PROJECT TITLE

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OUTLINE

- **Problem Statement** (Should not include solution)
- **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, 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, dieticians and nutritionists face limitations in scaling personalized consultations due to time and resource constraints.

PROPOSED SOLUTION

- **The proposed system aims to address the challenge of predicting the required bike count at each hour to ensure a stable supply of rental bikes. This involves leveraging data analytics and machine learning techniques to forecast demand patterns accurately. The solution will consist of the following components:**
- Data Collection
  - Gather user data: age, weight, goals, allergies, conditions.
  - Use nutrition databases (e.g., USDA) and IBM services for speech/image input
- Data Preprocessing
  - Clean and extract key details using NLP (e.g., food names, preferences).
  - Convert voice to text using IBM Watson Speech to Text.
- AI & ML Integration
  - Use IBM Granite LLM for generating meal plans and explanations.
  - Adapt recommendations based on continuous user feedback.
- Deployment
  - Deploy chatbot on IBM Cloud using Watson Assistant.
  - Use IBM Cloud Functions for backend processing
- Evaluation
  - Collect user feedback to improve suggestions.
  - Monitor performance for improvements
    - Result:An intelligent, interactive AI assistant that delivers real-time, personalized, and explainable meal plans, helping users achieve their health goals effectively.

SYSTEM APPROACH

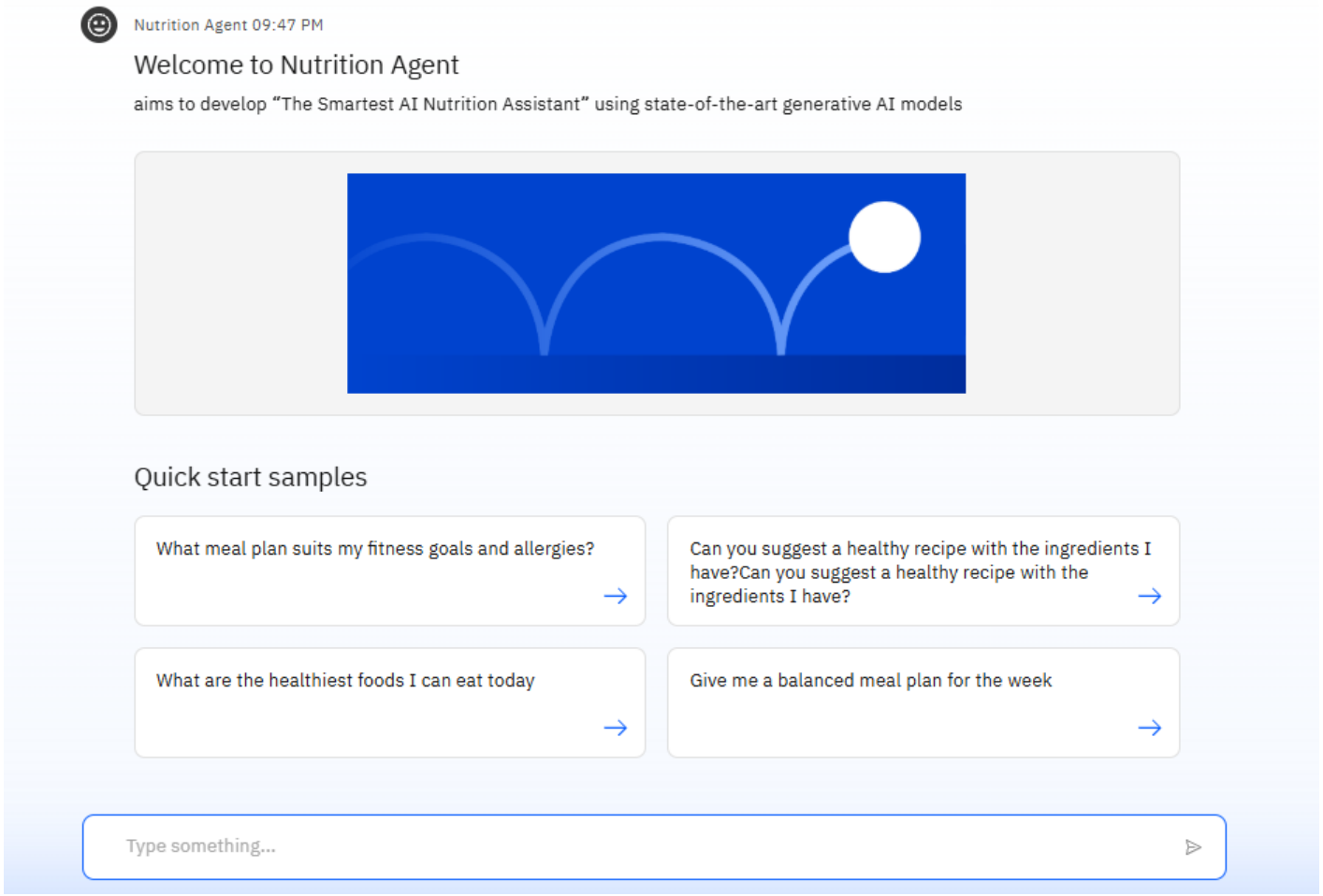
The "System Approach" section outlines the overall strategy and methodology for developing and implementing the Nutrition Agent. Here's a suggested structure for this section:

- System Requirements:
- 8 GB RAM, i5 processor
- Python 3.8+, IBM Cloud Lite account
- Webcam, mic, internet
- Libraries: pandas, opencv-python, ibm-watson, requests, flask

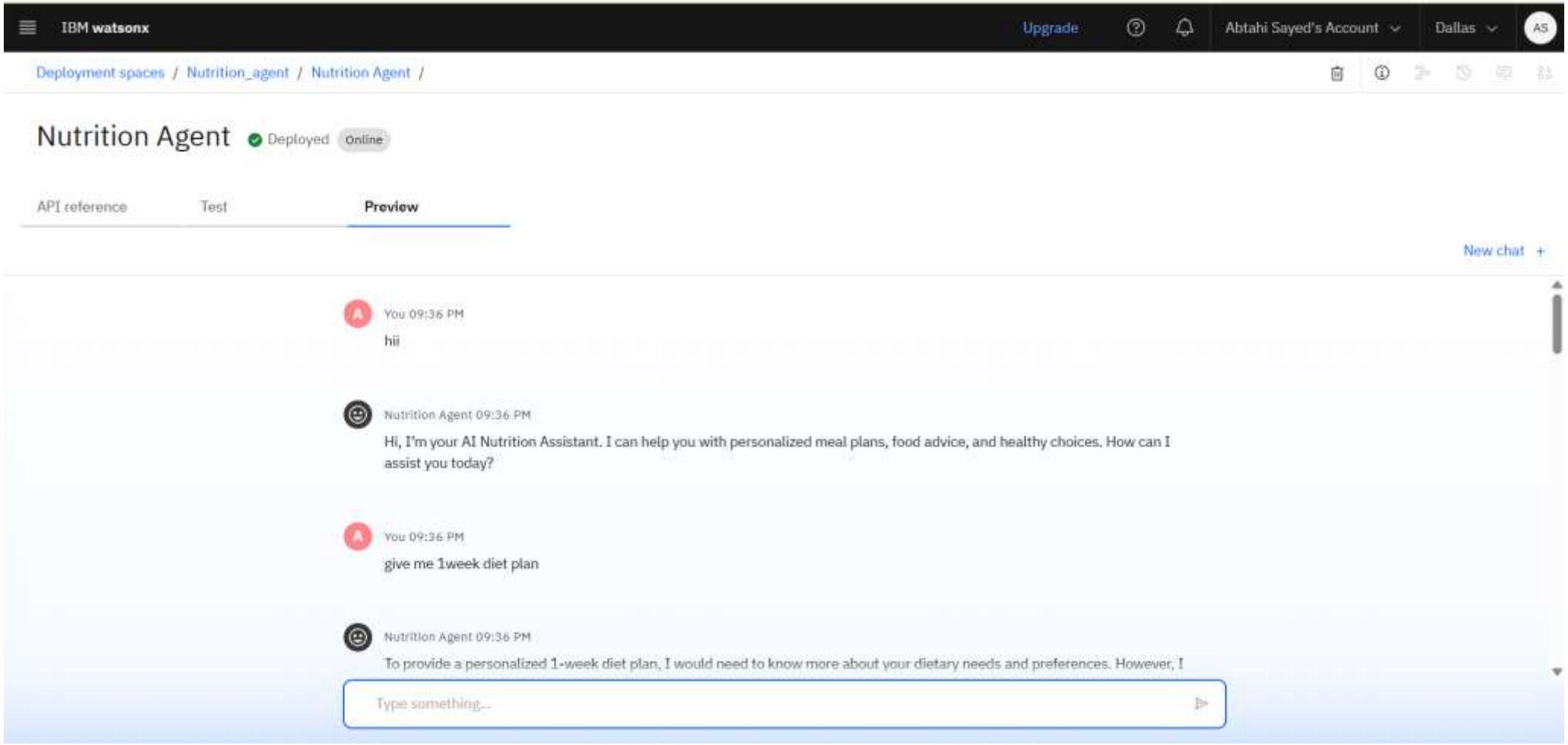
ALGORITHM & DEPLOYMENT

- In the Algorithm section. Here's an example structure for this section:
- **Algorithm Selection:**
- The system uses a generative AI model (IBM Granite LLM) combined with rule-based filtering for health-specific conditions (e.g., allergies, diabetes). This choice is ideal because:
- LLMs can reason, generate, and adapt meal plans based on varied, natural language inputs.
- Rules ensure safety and personalization (e.g., no peanuts for allergy users).
- **Data Input:**The model uses the following inputs:
- User profile data: age, gender, height, weight, goals (e.g., weight loss, muscle gain)
- Health conditions: diabetes, hypertension, allergies
- **Training Process:**
- IBM Granite LLM is pre-trained, but customized via prompt engineering.
- User-specific constraints (e.g., no sugar, high protein) are injected dynamically into prompts..
- **Prediction Process:**
- The system generates personalized meal plans with explanations (e.g., “This has low carbs for your diabetic condition”).

RESULT


Nutrition Agent 09:47 PM
Welcome to Nutrition Agent
aims to develop “The Smartest AI Nutrition Assistant” using state-of-the-art generative AI models
Quick start samples
What meal plan suits my fitness goals and allergies?
Can you suggest a healthy recipe with the ingredients I have?Can you suggest a healthy recipe with the ingredients I have?
What are the healthiest foods I can eat today
Give me a balanced meal plan for the week
Type something...

RESULT



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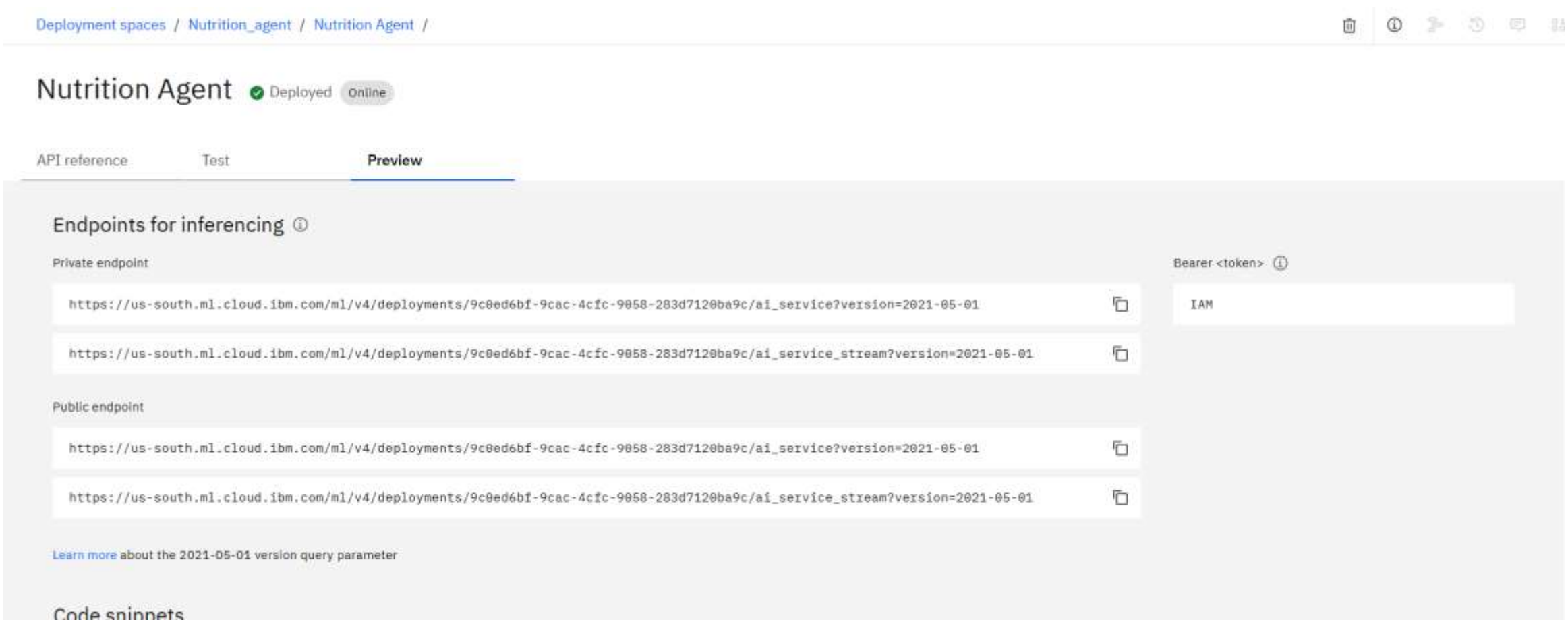
RESULT



CONCLUSION

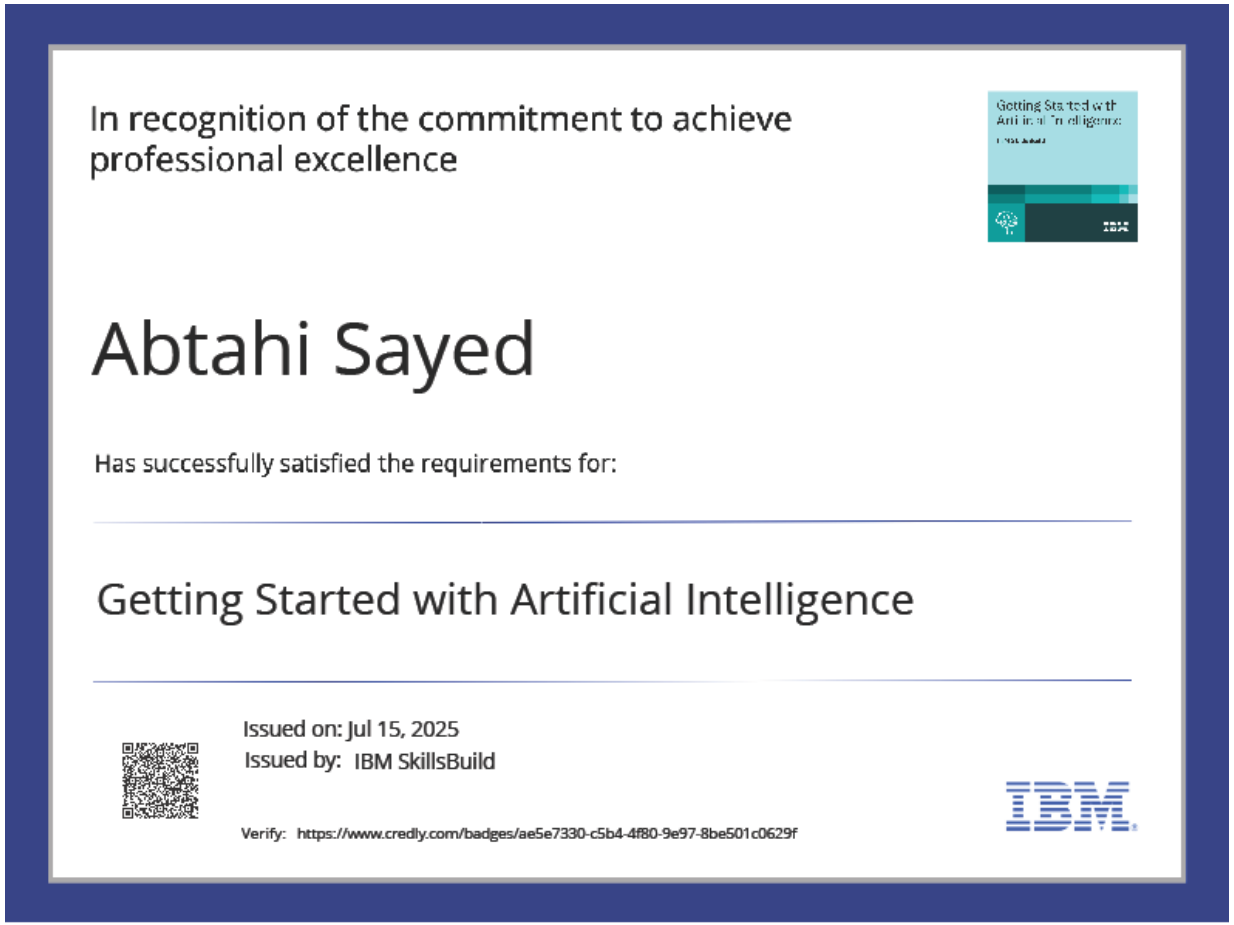
- The Nutrition Agent effectively delivers highly personalized and medically relevant meal plans using IBM Granite LLM and Watson AI services. It not only adheres to health guidelines but also adapts to feedback, making it a viable virtual alternative to human dieticians.

FUTURE SCOPE

- Discuss potential enhancements and expansions for the system. This could include incorporating additional data sources, optimizing the algorithm for better performance, and expanding the system to cover multiple cities or regions. Consider the integration of emerging technologies such as edge computing or advanced machine learning techniques.

IBM CERTIFICATIONS

getting started with AI



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IBM CERTIFICATIONS

- Journey to Cloud

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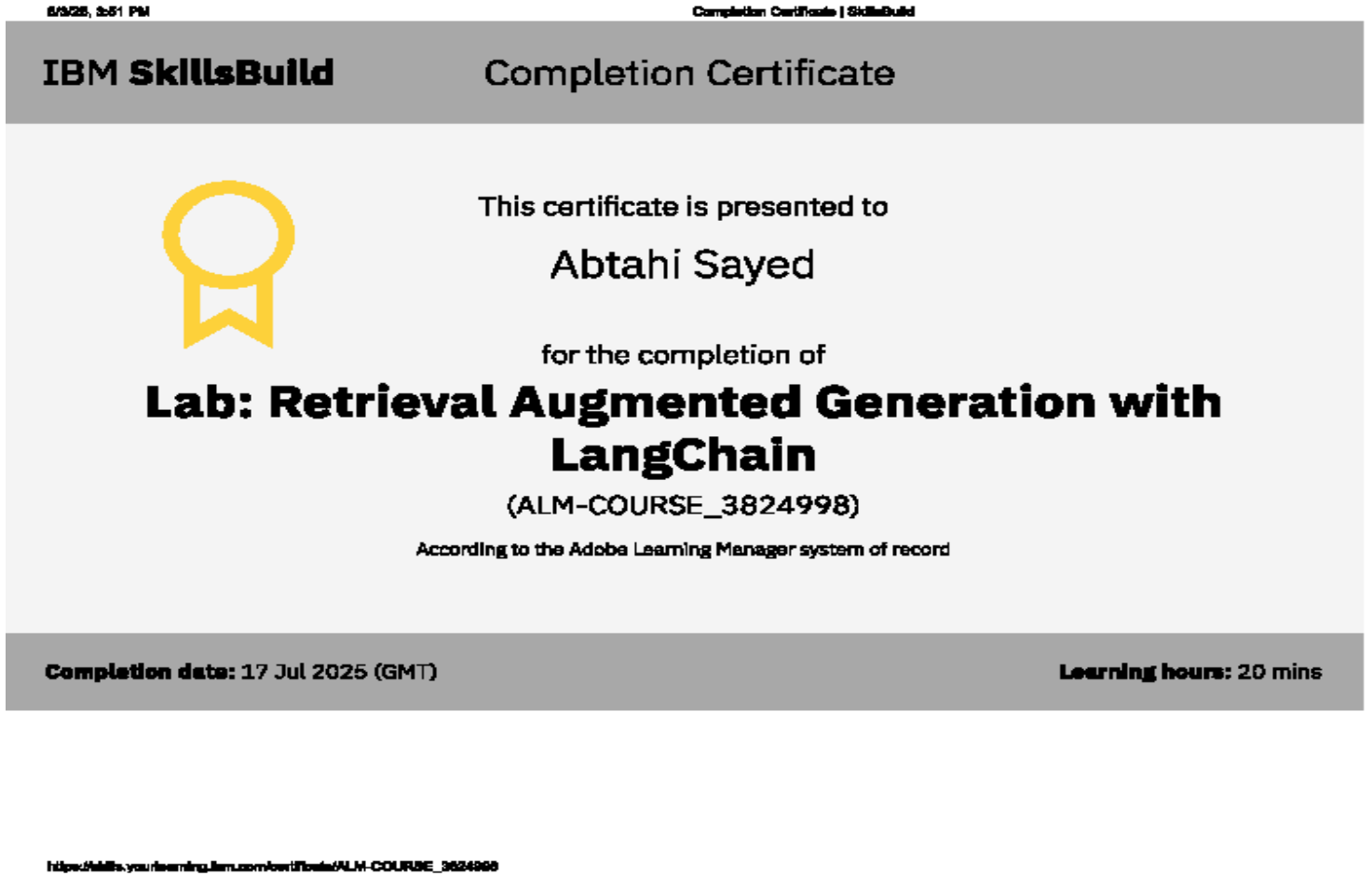
IBM CERTIFICATIONS

- RAG Lab



THANK YOU

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