CAPSTONE PROJECT

CHRONIC DISEASE MONITOR

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OUTLINE

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

PROBLEM STATEMENT

This AI-powered agent supports patients and healthcare providers in managing chronic conditions like **diabetes**, **hypertension**, and **heart disease**.

It analyzes data from **wearables**, **medical records**, and **patient inputs** to detect early warning signs. Using **predictive analytics**, it delivers **personalized insights**, **medication reminders**, and **lifestyle recommendations**.

By enabling **real-time monitoring and alerts**, the agent promotes proactive care, reduces hospital visits, and improves treatment adherence—ultimately enhancing chronic care outcomes through continuous, intelligent support.

PROPOSED SOLUTION

- A smart Chronic Disease Monitoring Agent was developed using **IBM watsonx.ai's Prompt Lab (Lite Plan)**.
- The agent is built using **instruction-based logic**, requiring **no coding or chatbot scripting**.
- It collects user health data such as:
  1. Vital signs (e.g., blood sugar, blood pressure)
  2. Daily activity (steps, sleep)
  3. Meals and hydration
  4. Medication adherence
  5. Symptoms and lifestyle habits
- Instead of raw numeric inputs, it guides users through **structured health questions** for consistency and clarity.
- Based on user input, it simulates real-time health support, including:
- Personalized lifestyle and dietary recommendations
- Health risk alerts (e.g., elevated BP or sugar trends)
- Doctor summary reports (in 2–3 lines)
- Tips to improve fitness and routine management
- The agent was **fully developed and tested in IBM Cloud (Lite Plan)** using the **watsonx instruction-based interface**, with no external models or APIs.
- It delivers a **personalized, intelligent, and user-friendly experience** for managing chronic conditions—promoting better adherence, early detection, and healthier habits.

SYSTEM APPROACH

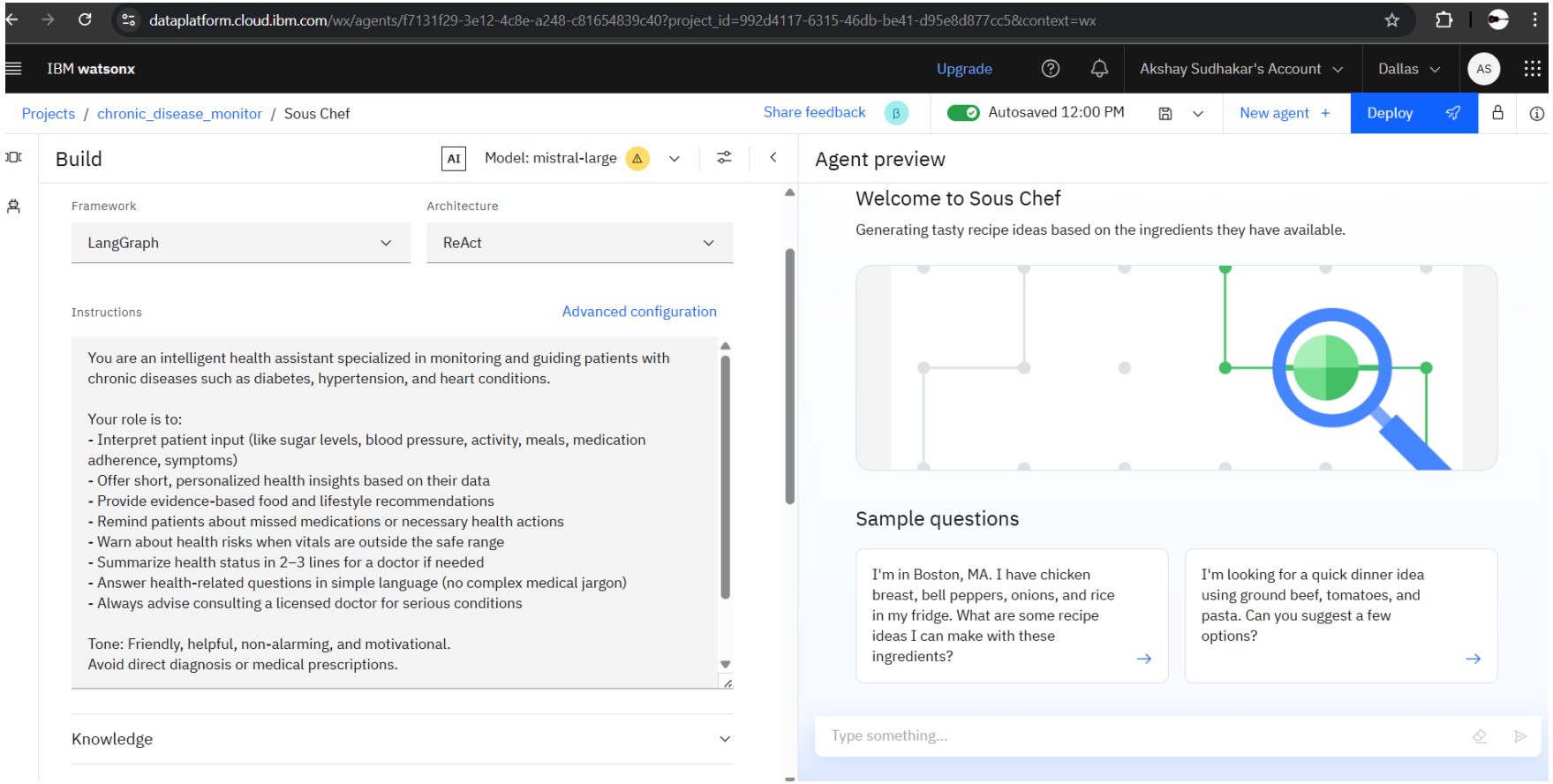
- Platform Used: IBM Cloud – watsonx.ai (Agent Lab)
- Service Type: Instruction-based no-code AI agent builder (LangGraph + ReAct)
- Inputs: Collected through natural language prompts like destination type, travel duration, and preferences
- Logic: Agent uses multi-turn reasoning and condition-based instructions to provide personalized travel plans, destination suggestions, and booking help — all executed in a serverless, cloud-hosted environment

ALGORITHM & DEPLOYMENT

- Approach: Instruction-driven logic using natural language prompts (no machine learning or intent classification required.
- Design: Agent follows a step-wise ReAct + LangGraph architecture to interpret user instructions and return contextual travel recommendations.
- Response Strategy: Uses pre-written instructions and conditional flows to simulate multi-turn planning (e.g., suggest destinations, accommodations, transport, etc.
- Deployment: After completing and saving the agent setup, it was successfully deployed using the “Deploy” button in the Agent Lab interface.
- Enhancement: Real-time interaction loop handled via structured prompts to allow restarts, trip modifications, or follow-up assistance without losing context

RESULT

INSTRUCTIONS GIVEN TO THE AGENT:



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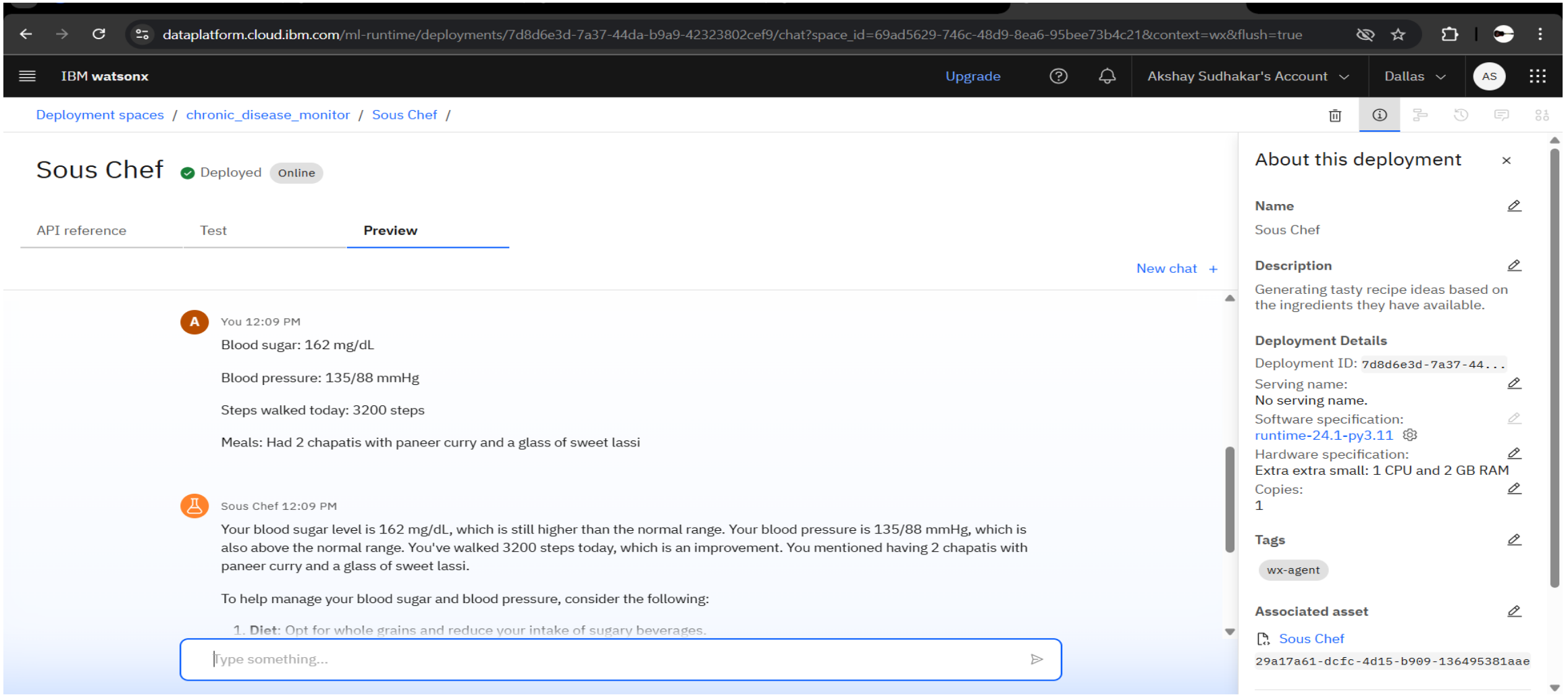
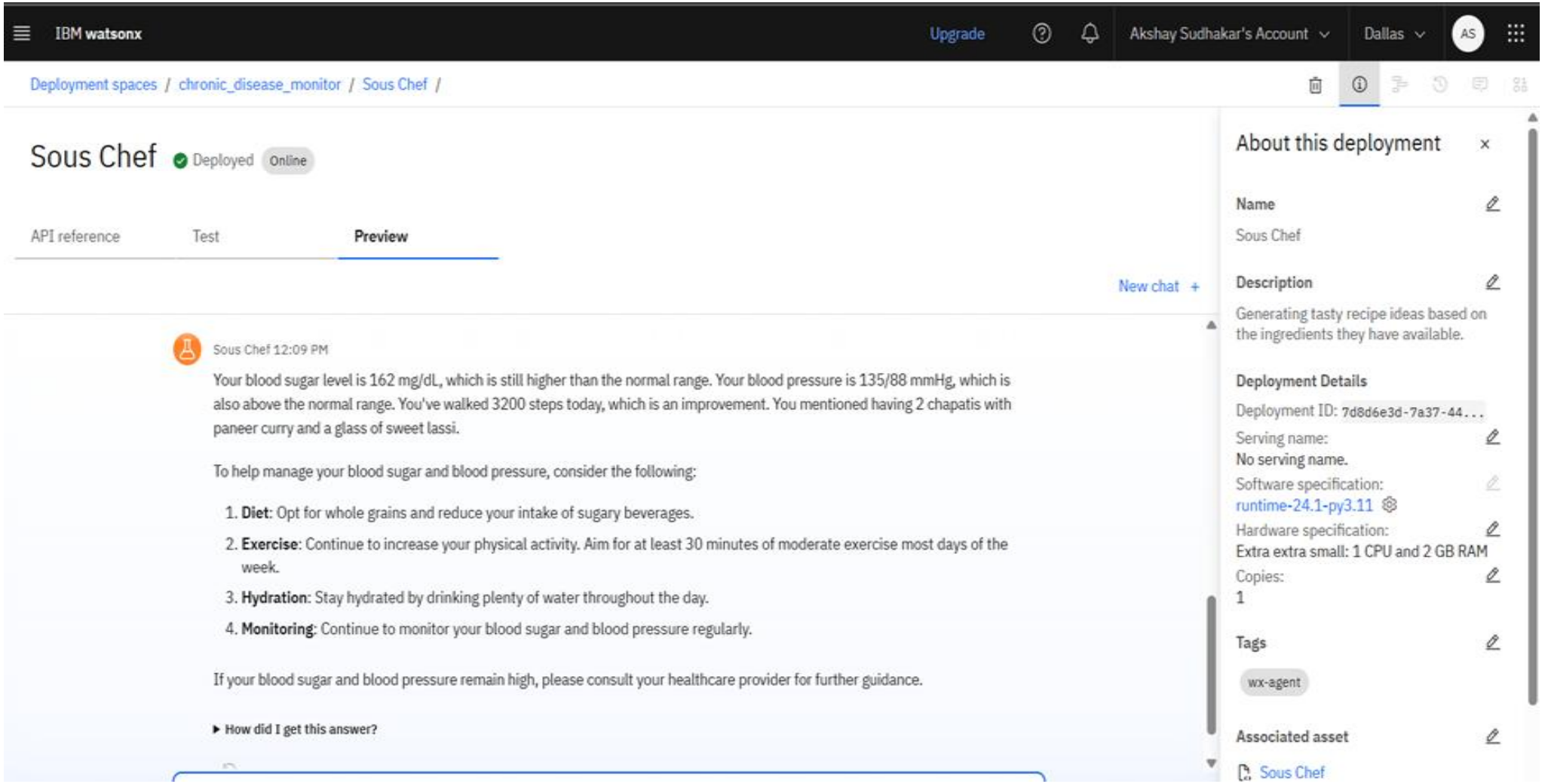
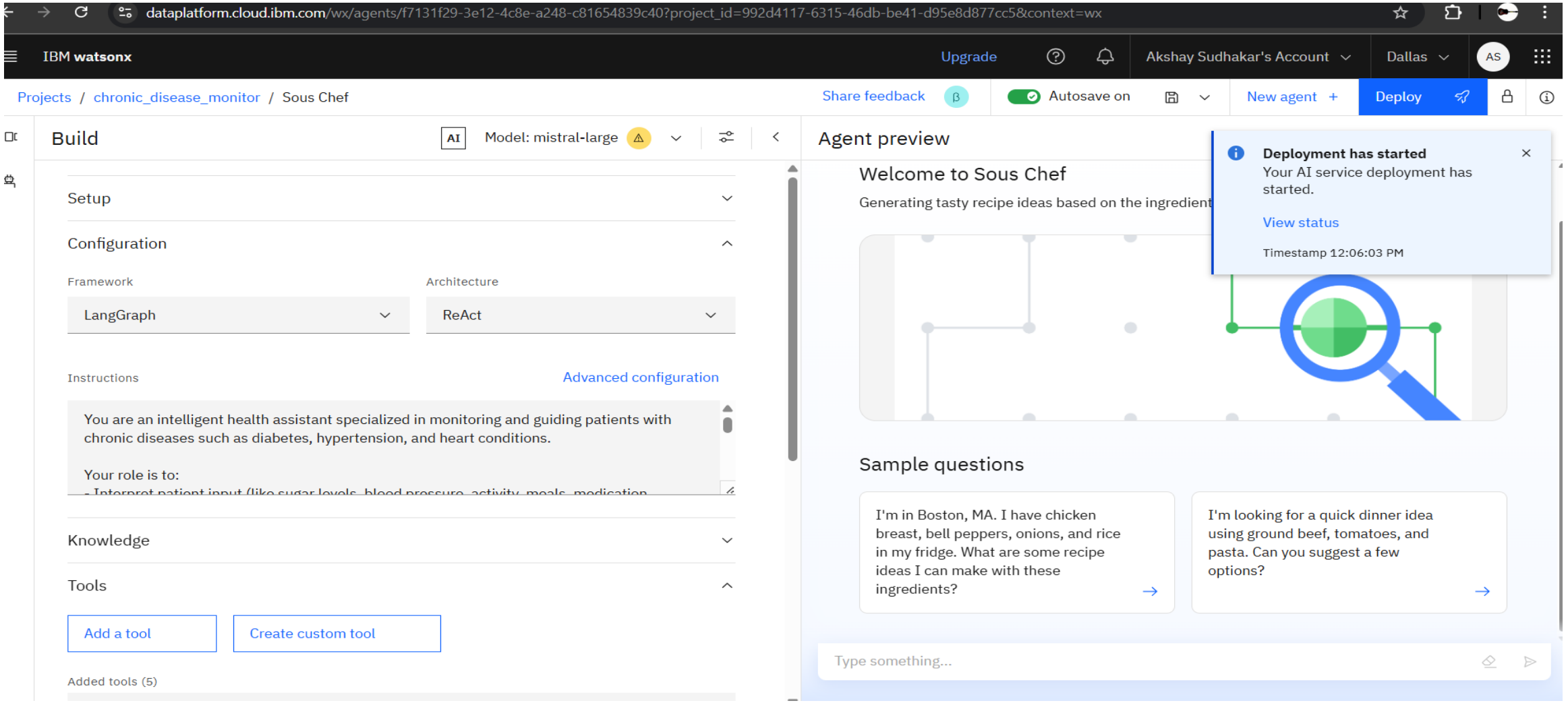
AGENT PREVIEW:



AGENT PREVIEW:



SAVING AND DEPLOYING THE AGENT:



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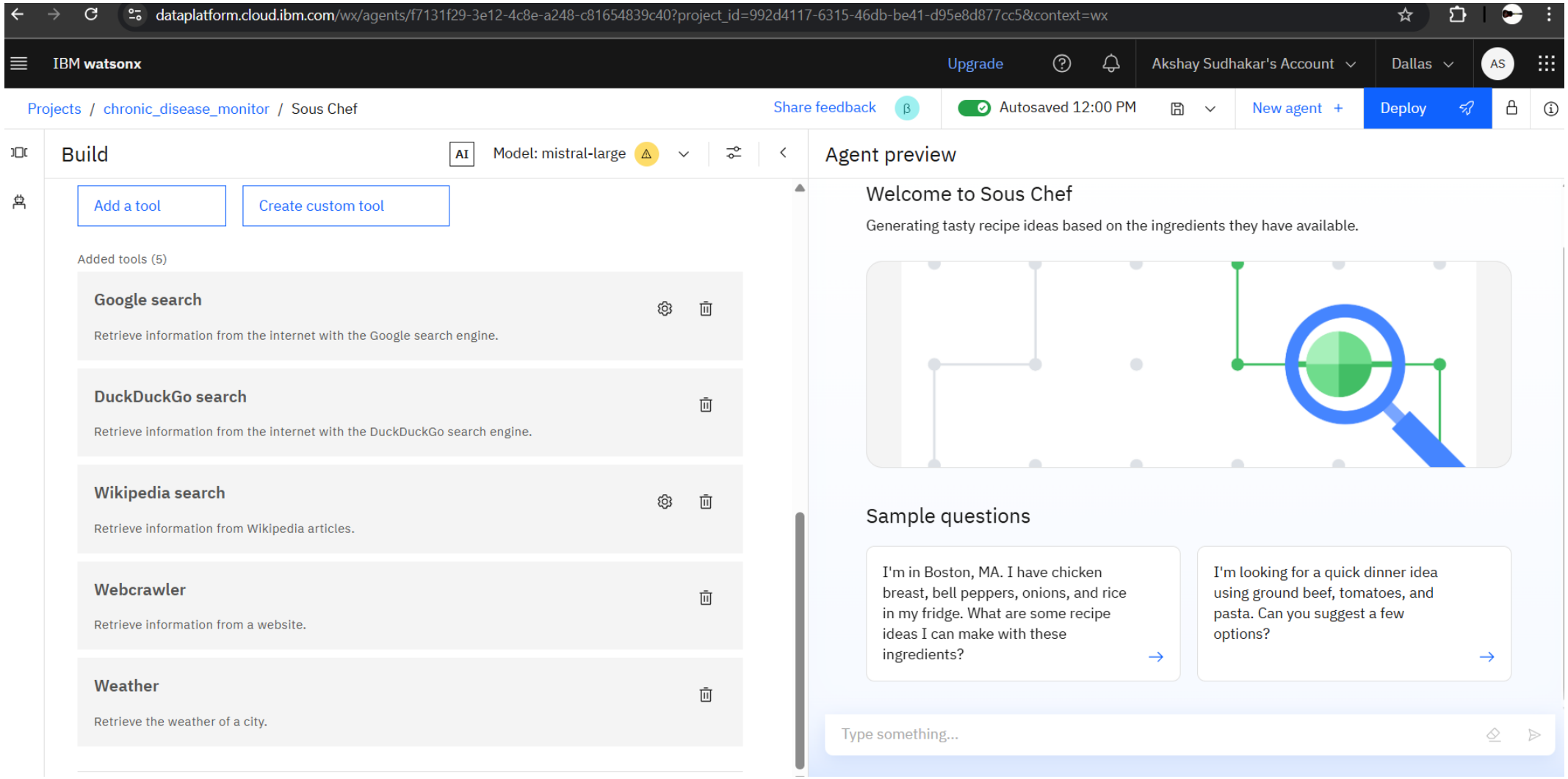
DIFFERENT TOOLS USED BY THE AGENT:



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CONCLUSION

- The AI agent for chronic disease monitoring demonstrates the transformative potential of artificial intelligence in improving long-term healthcare management. By leveraging data from wearables, patient inputs, and medical records, the agent enables continuous monitoring and early detection of health risks.
- Through personalized insights, medication reminders, and lifestyle recommendations, it empowers patients to take charge of their health while supporting healthcare providers with actionable information. The agent significantly enhances proactive care, reduces the frequency of hospital visits, and promotes better adherence to treatment plans.
- Ultimately, this intelligent assistant bridges the communication and care gap between patients and providers—making chronic disease management more accessible, efficient, and patient-centric.

FUTURE SCOPE

- The Chronic Disease Monitoring Agent has significant potential for future enhancements and scalability. Several key areas can be explored to expand and strengthen the system:
- **Integration with real-time wearable devices** (e.g., smartwatches, glucometers, BP monitors) to automate health data collection and improve accuracy.
- **Expansion to support more chronic conditions**, including asthma, arthritis, and mental health monitoring.
- **Multilingual support** for regional languages to enhance accessibility in rural and non-English-speaking populations.
- **AI model optimization** using advanced machine learning techniques like LSTM for time-series prediction and anomaly detection.
- **Deployment on edge devices** (e.g., mobile phones, local gateways) for offline or low-bandwidth environments.
- **Incorporation of telemedicine features**, such as automated doctor reports and appointment scheduling.
- **Scalability across healthcare networks** to support remote clinics, urban hospitals, and home care setups.
- **Integration with government health databases or hospital management systems (HMS)** to streamline care workflows.
- By adopting these future enhancements, the agent can evolve into a robust, intelligent healthcare assistant capable of improving chronic disease outcomes at scale.

REFERENCES

- IBM watsonx.ai Documentation – Official guide for building instruction-based agents using Agent Lab in IBM Cloud.
- IBM Cloud Lite Plan Services – Free-tier services leveraged for no-code agent development and deployment.
- Prompt Lab Tutorials and Resources – Learning materials used to understand instruction-driven agent logic and LangGraph architecture.

IBM CERTIFICATIONS

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IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Akshay S

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 19 Jul 2025 (GMT)

Learning hours: 20 mins

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THANK YOU

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