CAPSTONE PROJECT

Health Symptom Checker

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OUTLINE

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- **System Development Approach** (Technology Used)
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Problem Statement

An Agentic AI Health Symptom Checker helps users understand their health conditions by analySing symptoms and providing probable causes, preventive advice, and care recommendations.It retrieves verified medical data, symptom databases, and guidelines from trusted sources like WHO,government health portals, and medical journals.
Users can input symptoms in natural language such as “I have a sore throat and fever,” and the agent provides possible conditions, urgency level, home remedies, and when to consult a doctor.
It supports multi-language interaction and avoids self-diagnosis risks by offering educational and referral-based suggestions.
This AI-driven assistant promotes early detection, reduces misinformation, and empowers users to take informed health actions.

Proposed Solution

- Data Collection
  - Gather data from trusted medical sources such as the World Health Organization (WHO), national health portals, and medical journals.
  - Incorporate verified symptom databases and public health guidelines to map symptoms to possible conditions.
  - Utilize real-time health data where available (e.g., seasonal outbreaks, regional health alerts).
- Data Preprocessing
  - Clean and standardize medical data to handle inconsistencies and ensure uniform interpretation.
  - Extract symptom-condition relationships and identify key indicators for common health issues.
  - Ensure data privacy and anonymization when handling any user interaction logs.
- Deployment
  - Build a user-friendly conversational interface that allows users to input symptoms in plain natural language (e.g., "I have a sore throat and fever").
  - Support multilingual interactions to ensure accessibility for diverse populations.
  - Deploy the solution on a scalable, secure cloud-based platform (IBM Watsonx), ensuring fast response time and reliable uptime.
- Evaluation
  - Monitor system performance using user feedback, response accuracy, and satisfaction levels.
  - Continuously improve symptom-condition mappings based on updated medical data and evolving health guidelines.
  - Incorporate expert review cycles to validate outputs and ensure ongoing trustworthiness.

System Approach

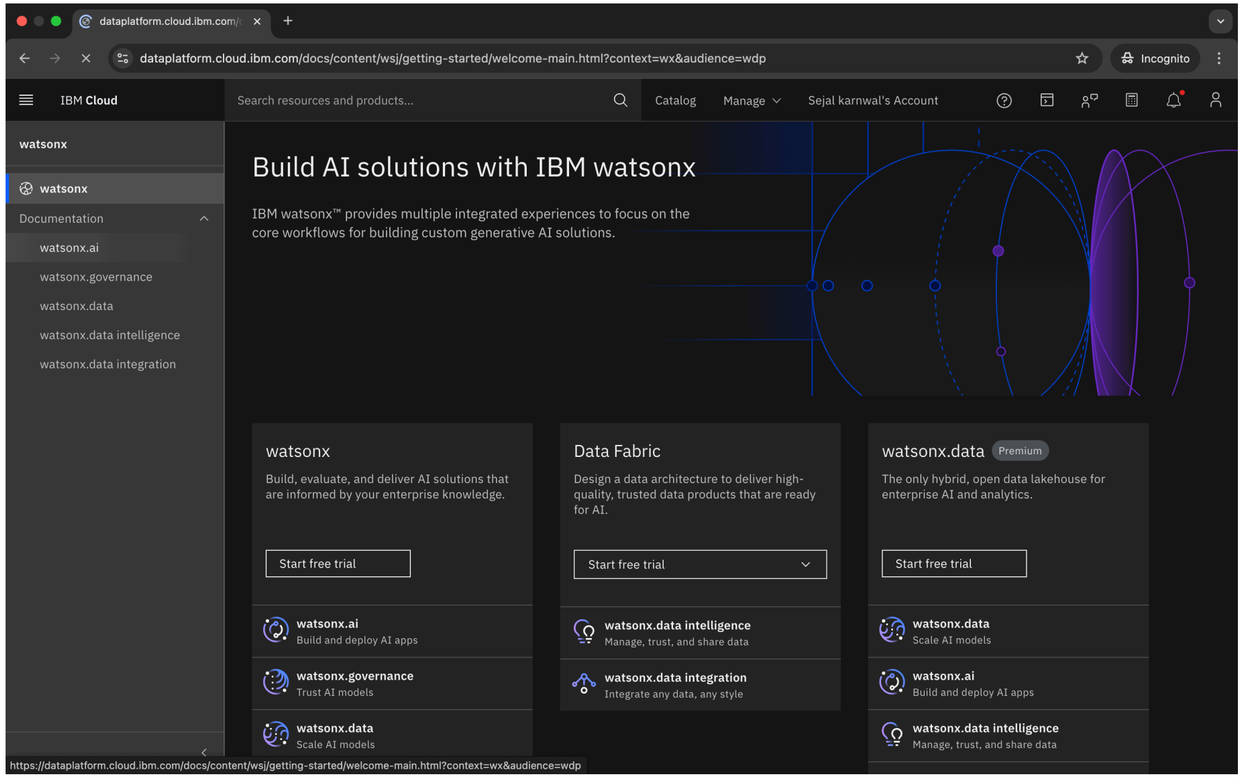
System Requirement:

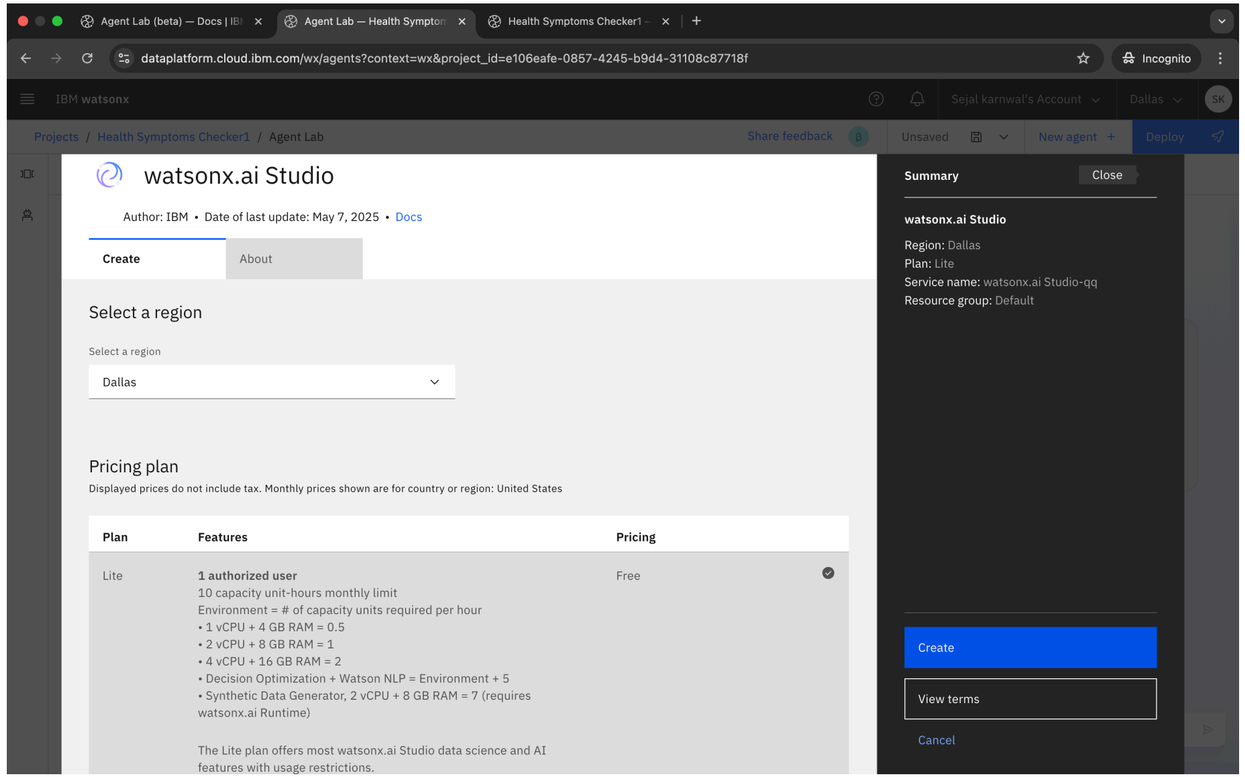
- Device: MacBook Air
- Processor: Apple M1 chip (8-core CPU)
- RAM: 8 GB unified memory
- Storage: 256 GB SSD (configurable)
- Operating System: macOS Monterey or later
- Display: 13.3-inch Retina Display
- Battery Life: Up to 15 hours wireless web
- Ports: 2x Thunderbolt / USB 4, 3.5mm headphone jack
- Ideal For: Lightweight AI/ML development, cloud-based deployments, web app testing

Library required to build a model

"No local ML libraries required. IBM Watsonx Agent handles NLP and deployment through cloud-native tools. Optional use of ibm-watson and requests libraries for integration or enhancement."

Result





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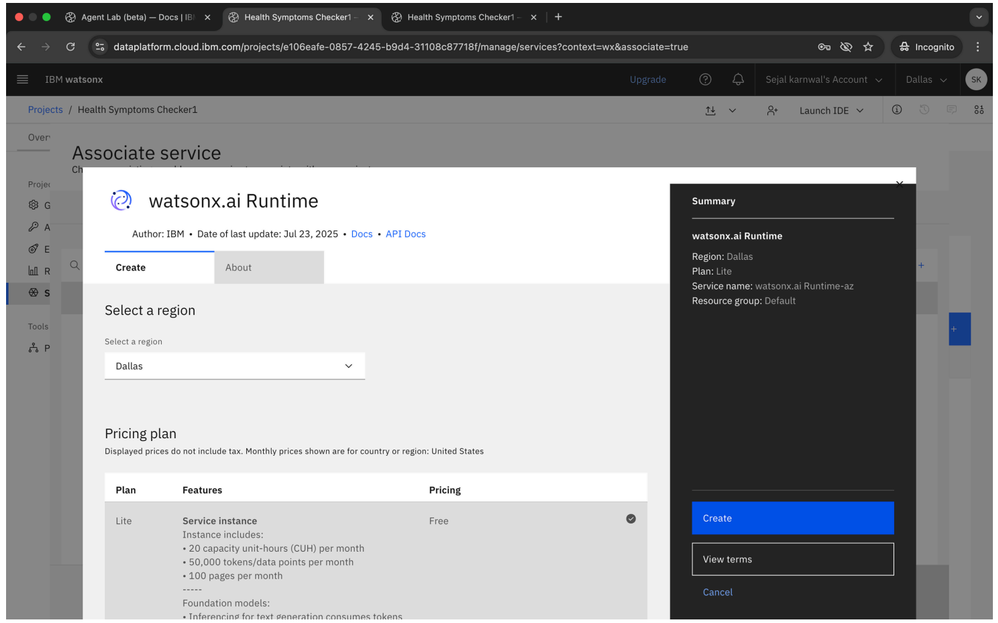
Agent Lab (beta) — Docs | IBM
Health Symptoms Checker1
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Sejal karnwal's Account
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Projects / Health Symptoms Checker1
Launch IDE
Associate service
watsonx.ai Runtime
Author: IBM • Date of last update: Jul 23, 2025 • Docs • API Docs
Create
About
Select a region
Select a region
Dallas
Pricing plan
Displayed prices do not include tax. Monthly prices shown are for country or region: United States
Plan
Features
Pricing
Lite
Service instance
Instance includes:
• 20 capacity unit-hours (CUH) per month
• 50,000 tokens/data points per month
• 100 pages per month
Foundation models:
Free
Summary
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Region: Dallas
Plan: Lite
Service name: watsonx.ai Runtime-az
Resource group: Default
Create
View terms
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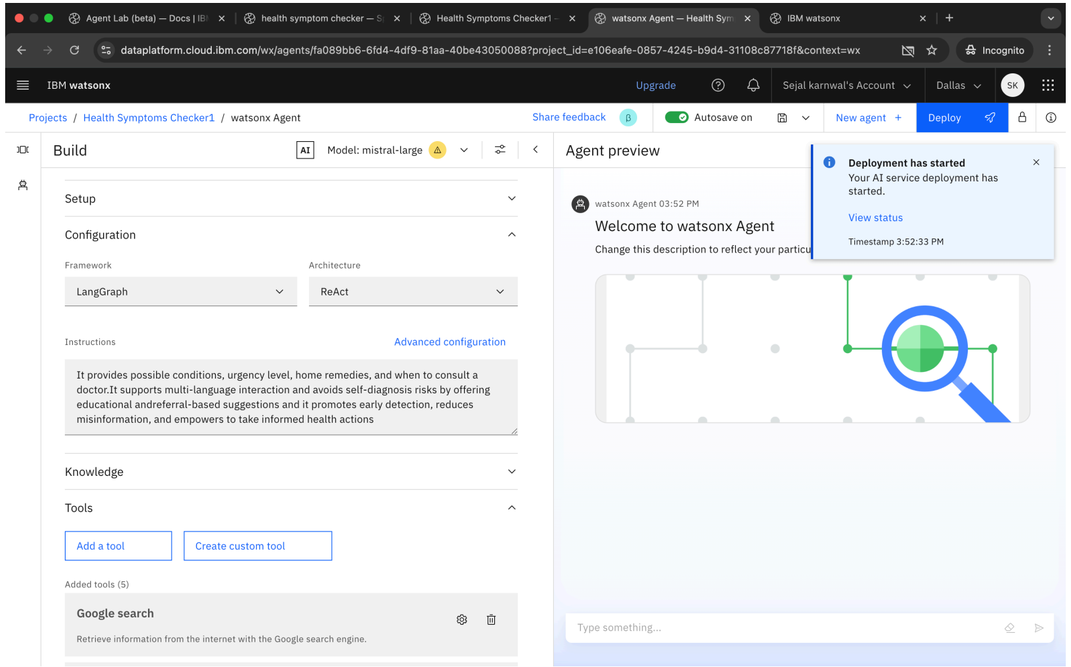
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Incognito
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Upgrade
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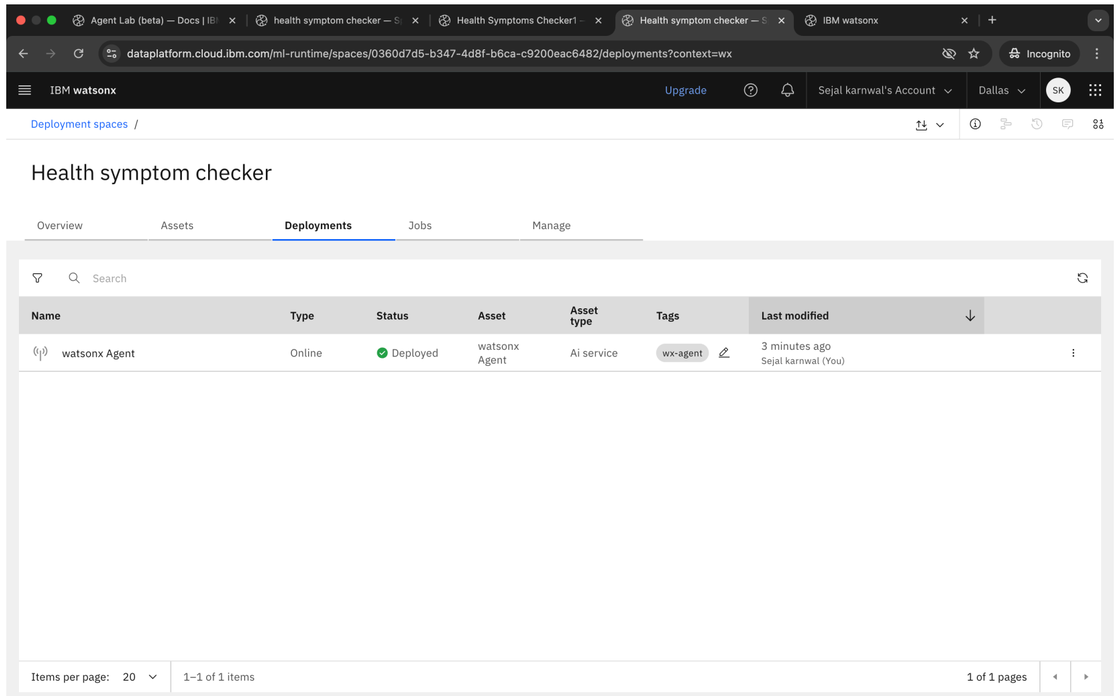
Projects / Health Symptoms Checker1 / watsonx Agent
Share feedback
Autosave on
New agent
Deploy
Build
AI
Model: mistral-large
Setup
Configuration
Framework
LangGraph
Architecture
ReAct
Instructions
Advanced configuration
It provides possible conditions, urgency level, home remedies, and when to consult a doctor.It supports multi-language interaction and avoids self-diagnosis risks by offering educational andreferral-based suggestions and it promotes early detection, reduces misinformation, and empowers to take informed health actions
Knowledge
Tools
Add a tool
Create custom tool
Added tools (5)
Google search
Retrieve information from the internet with the Google search engine.
Agent preview
Deployment has started
Your AI service deployment has started.
View status
Timestamp 3:52:33 PM
watsonx Agent 03:52 PM
Welcome to watsonx Agent
Change this description to reflect your particu
Type something...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Incognito
IBM watsonx
Upgrade
Sejal karnwal's Account
Dallas
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Deployment spaces /
Health symptom checker
Overview
Assets
Deployments
Jobs
Manage
Search
Name
Type
Status
Asset
Asset type
Tags
Last modified
watsonx Agent
Online
Deployed
watsonx Agent
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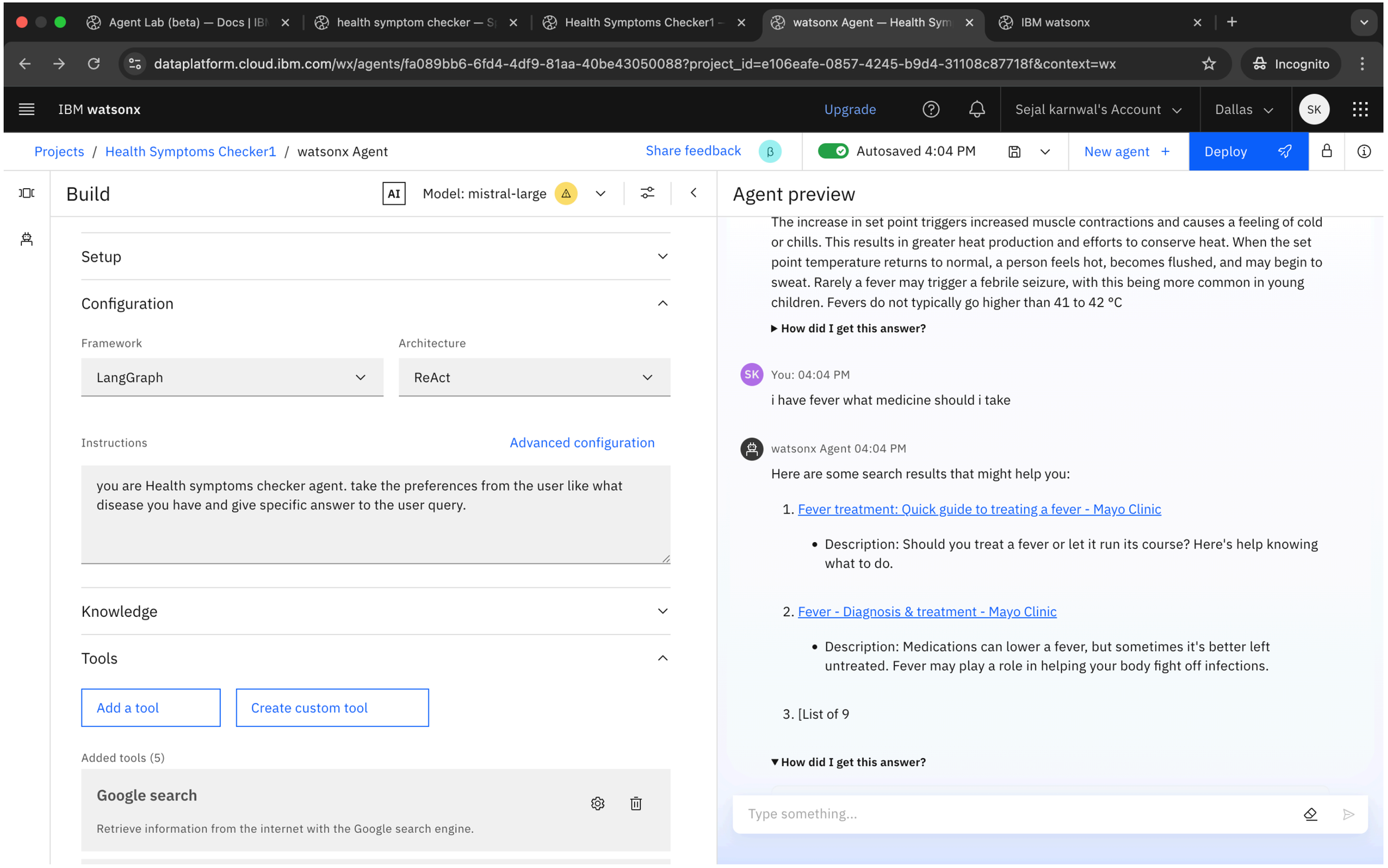
3 minutes ago
Sejal karnwal (You)
Items per page: 20
1–1 of 1 items
1 of 1 pages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Projects / Health Symptoms Checker1 / watsonx Agent
Share feedback
Autosaved 4:04 PM
New agent +
Deploy
Build
AI
Model: mistral-large
Setup
Configuration
Framework
LangGraph
Architecture
ReAct
Instructions
Advanced configuration
you are Health symptoms checker agent. take the preferences from the user like what disease you have and give specific answer to the user query.
Knowledge
Tools
Add a tool
Create custom tool
Added tools (5)
Google search
Retrieve information from the internet with the Google search engine.
Agent preview
The increase in set point triggers increased muscle contractions and causes a feeling of cold or chills. This results in greater heat production and efforts to conserve heat. When the set point temperature returns to normal, a person feels hot, becomes flushed, and may begin to sweat. Rarely a fever may trigger a febrile seizure, with this being more common in young children. Fevers do not typically go higher than 41 to 42 °C
▶ How did I get this answer?
SK
You: 04:04 PM
i have fever what medicine should i take
watsonx Agent 04:04 PM
Here are some search results that might help you:
1. Fever treatment: Quick guide to treating a fever - Mayo Clinic
• Description: Should you treat a fever or let it run its course? Here's help knowing what to do.
2. Fever - Diagnosis & treatment - Mayo Clinic
• Description: Medications can lower a fever, but sometimes it's better left untreated. Fever may play a role in helping your body fight off infections.
3. [List of 9
▼ How did I get this answer?
Type something...

Conclusion

- The Agentic AI Health Symptom Checker provides an intelligent, accessible, and educational platform for users to understand their health conditions through natural language interaction. By leveraging IBM Watsonx and trusted medical data sources, the system delivers reliable symptom analysis, urgency assessment, and care recommendations without encouraging self-diagnosis.
- The solution promotes early detection, combats health misinformation, and empowers users to take informed actions regarding their well-being. With its multilingual support, secure cloud deployment, and user-friendly interface, it stands as a scalable and socially impactful digital health tool for the modern world.

Future scope

1. Direct Integration with Healthcare APIs
   - Connect with APIs from government health services (like Ayushman Bharat, CDC, etc.) to fetch localized medical advice or healthcare center data.
2. User Health Profile Tracking
   - Add user accounts for saving past symptom queries, receiving personalized suggestions, or tracking recurring symptoms over time.
3. Voice-Based Interaction
   - Integrate speech-to-text and text-to-speech features for voice-based symptom checking, especially useful for elderly and visually impaired users.
4. Smart Alerts & Notifications
   - Send follow-up alerts or health tips based on seasonal diseases, user symptoms, or regional health updates.
5. Multilingual Expansion
   - Extend the agent's understanding and response capabilities to regional languages for wider public adoption in multilingual countries.
6. Medical Triage Integration
   - Add a triage system to classify symptoms into emergency, non-emergency, or self-care, and provide corresponding advice or referrals.
7. Enhanced Explainability
   - Integrate an "Explain this response" feature to help users understand why a certain suggestion or link was provided, improving trust and transparency.

References

- LangGraph by LangChain

LangChain. LangGraph Documentation. Retrieved from
https://docs.langchain.com/langgraph
(Framework used for building agent workflows with reasoning and tools.)

- IBM Watsonx

IBM Corporation. IBM Watsonx Platform. Retrieved from
https://www.ibm.com/watsonx
(Used for building, deploying, and managing the AI agent.)

- Mistral Language Model

Mistral AI. Open-weight language models. Retrieved from
https://mistral.ai/news/
(Used as the base language model for natural language understanding in the agent.)

- World Health Organization (WHO)

World Health Organization. Health Topics and Symptom Guidelines. Retrieved from
https://www.who.int/health-topics
(Used for verified medical content and symptom references.)

- National Health Portal of India

Ministry of Health and Family Welfare, Government of India. NHP Symptom Checker. Retrieved from
https://www.nhp.gov.in/
(For region-specific symptom descriptions and health guidance.)

- ReAct Prompting Method

Yao et al. (2022). ReAct: Synergizing Reasoning and Acting in Language Models. arXiv:2210.03629
https://arxiv.org/abs/2210.03629
(Reasoning approach used in the agent's architecture.)

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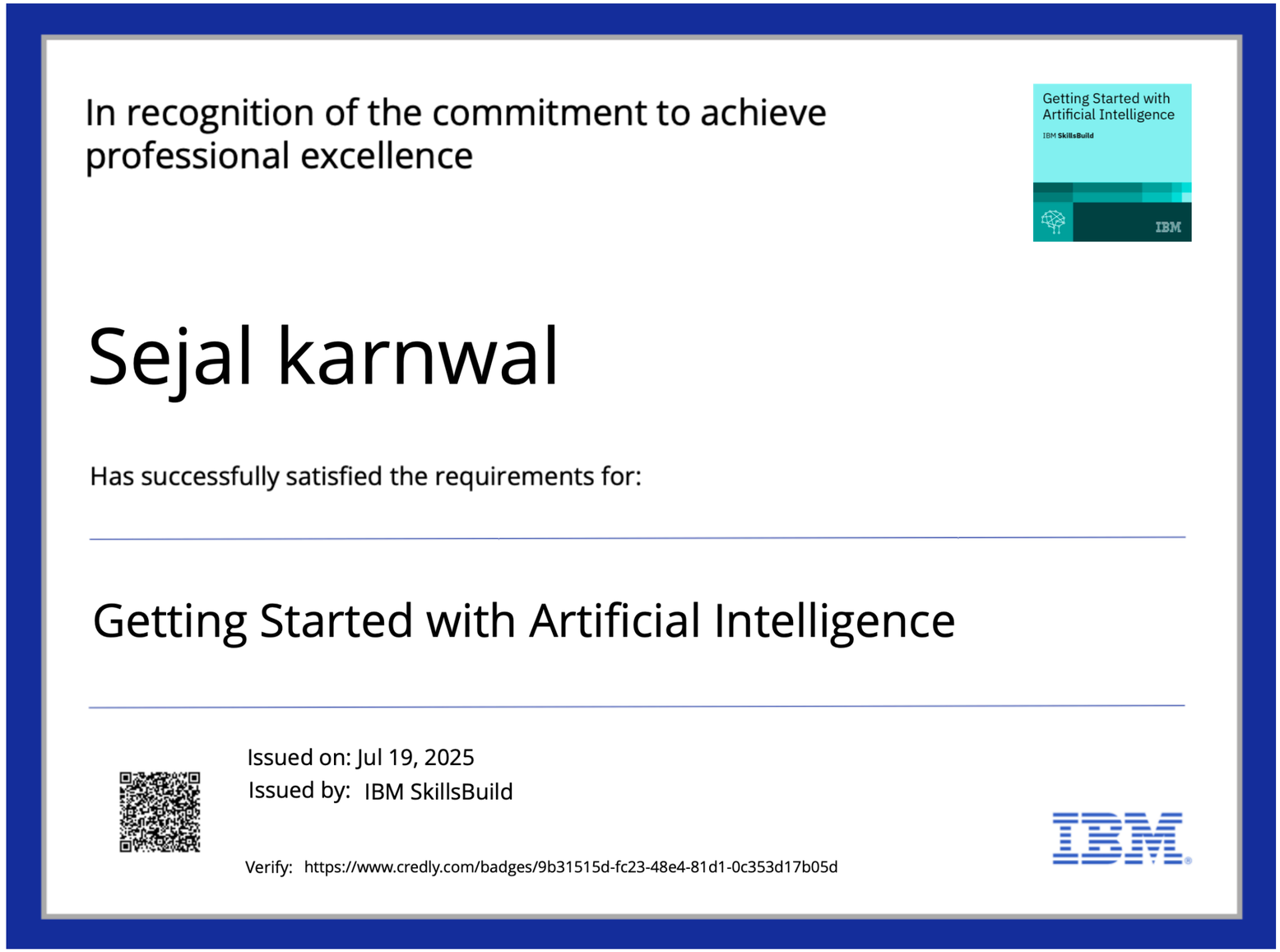
IBM Certifications



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According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT) **Learning hours:** 20 mins

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