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# CAPSTONE PROJECT

## AGENTIC AI HEALTH SYMPTOM CHECKER

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# OUTLINE

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

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# PROBLEM STATEMENT

People often struggle to interpret their health symptoms accurately, relying on unverified online sources that can lead to misinformation or delayed care. There is a need for a reliable, AI-driven symptom checker that provides trustworthy medical insights, preventive guidance, and actionable recommendation. While avoiding harmful self-diagnosis to empower users with accurate health information and improve early detection. It retrieves verified medical data, symptom databases, and guidelines from trusted sources like WHO, government health portals, and medical journals.

# PROPOSED SOLUTION

- The proposed system aims to address the challenge of providing accurate, accessible, and actionable health advice to users while reducing misinformation and unnecessary healthcare visits.
- This involves leveraging verified medical data, NLP-based symptom analysis, and multilingual support to deliver reliable health data.
- An Agentic AI Health Symptom Checker is developed to guide users in understanding their health symptoms by:
  1. Analyzing natural language symptom inputs (e.g., “I have a sore throat and fever”)
  2. By providing:
    - Probable health conditions
    - Level of Urgency (low, medium, high)
    - Preventive advice and home remedies
    - Guidance on when to consult a doctor
  3. Powered by IBM Watsonx.ai, the agent is trained to:
    - Use verified medical databases (WHO, CDC, government health portals)
    - Support multilingual interaction (e.g., English, Hindi, Kannada)
    - Avoid self-diagnosis by delivering educational and referral-based suggestions
- This AI-driven assistant aims to promote early detection, reduce misinformation, and empower users to take informed, safe health actions.

# SYSTEM APPROACH

- IBM Watsonx.ai – Foundation model deployment
- IBM Cloud Object Storage – For asset management
- IBM Watsonx.ai.Runtime – Provide Computation Power
- Streamlit (Optional) – For user-friendly web UI
- Language Detection Library
- Translation APIs – For multilingual support (e.g., Google Translate API)
- Verified Medical Datasets – WHO, CDC, Government health portals
- Libraries Used: IBM-Watsonx-ai – Accessing IBM foundation models streamlit – Lightweight
- UI for testing (optional)
- langdetect – Detects language of user input
- Requests-json API calls and data handling
- dotenv –For secure environment variable storage (e.g., API keys)

# MODEL & DEPLOYMENT

- Model Selection: IBM Watsonx Foundation Model: Llama-3-3-70b-instruct model.
  - Large Language Model (LLM) used for symptom understanding.
  - Works through prompt engineering (no retraining needed).
  - Supports multilingual, safe, and informative responses.
- Input & Response Process
  - Input: User's symptom in natural language (e.g., "I have a sore throat and fever").
  - Language detection performed if not in English.
  - AI processes the prompt and responds with:
    1. Probable health conditions
    2. Urgency level (low/medium/high)
    3. Preventive care & home tips
    4. Referral advice (if needed)
    5. Safety disclaimer

# RESULT

The screenshot displays the IBM watsonx Agent Lab interface. The top navigation bar includes the IBM watsonx logo, an Upgrade button, a help icon, a notification bell, and user account information for Iqra Fathima's Account in London. The main interface is divided into two panels. The left panel, titled 'Build', contains sections for Setup, Configuration, Instructions, Knowledge, and Tools. Under Configuration, the Framework is set to 'LangGraph' and the Architecture to 'ReAct'. The Instructions section contains a text box with the following text: 'You are a Health Checker Agent. You understand the health condition by analyzing symptoms and provide probable causes and preventive measures and the urgency level. Your responses must be evidence-based, cautious, and non-diagnostic.' Below this, there are buttons for 'Add a tool' and 'Create custom tool'. The right panel, titled 'Agent preview', shows a chat interface with a message from 'watsonx Agent 03:29 PM' saying 'Welcome to watsonx Agent' and 'Change this description to reflect your particular agent'. Below the message is a diagram of a graph with nodes and edges, and a magnifying glass icon. At the bottom of the chat interface is a text input field with the placeholder 'Type something...' and a send button.

- I have instructed the agent to provide health advise based on symptoms in the Instructions block.
- The agent is trained using the Llama-3-3-70b-instruct model.

# RESULT

The screenshot displays the IBM watsonx Agent Lab interface. The top navigation bar includes the IBM watsonx logo, an 'Upgrade' button, a help icon, a notification bell, and user information for 'Iqra Fathima's Account' in 'London'. Below the navigation bar, the breadcrumb trail shows 'Projects / Health\_Agent1 / Agent Lab'. The main interface is split into two panels. The left panel, titled 'Build', shows the 'Model: llama-3-3-70b-instruct' and a list of 'Added tools (5)': 'Google search', 'DuckDuckGo search', 'Wikipedia search', 'Webcrawler', and 'Weather'. Each tool has a description and a trash icon. The right panel, titled 'Agent preview', shows a chat window with a 'watsonx Agent 03:30 PM' message: 'Welcome to watsonx Agent' and 'Change this description to reflect your particular agent'. Below the message is a diagram of a neural network with a magnifying glass icon. At the bottom of the chat window is a text input field with the placeholder 'Type something...'. The top right of the interface has buttons for 'Share feedback', 'Unsaved', 'New agent +', and 'Deploy'.

- For verified medical datasets, I have included search engines like Google, Wikipedia, and DuckDuckGo.



# RESULT

[Projects](#) / [Health Agent](#) / Agent Lab

[Share feedback](#) β Unsaved New agent + Deploy

Build

Setup

Configuration

FrameworkArchitecture

LangGraphReAct

Instructions

You are a trusted AI Health Assistant. Your task is to interact with users who may be experiencing health symptoms and are looking for guidance.

Knowledge

Tools

Add a toolCreate custom tool

Added tools (4)

AI

Model: llama-3-3-70b-instruct

Model parameters

You can edit parameters only when the conversation has been cleared in chat mode.

Clear chat

Frequency penalty

-2 2 0

Presence penalty

-2 2 0

Temperature

0 2 0

Top P (nucleus sampling)

0.01 1 1

Max tokens

2000

Agent preview

IF You: 04:25 PM

hi

watsonx Agent 04:25 PM

Hello! I'm here to help you with any health concerns or symptoms you may be experiencing. Please describe how you're feeling, and I'll do my best to provide guidance and support.

Remember, I'm not a substitute for professional medical care. If you're experiencing severe or persistent symptoms, it's essential to consult a licensed medical professional for an accurate evaluation and treatment.

What symptoms are you experiencing?

⚠ This is not a diagnosis. For medical emergencies or accurate evaluation, consult a licensed medical professional.

► How did I get this answer?

Type something...

# RESULT

The screenshot shows the 'Build' tab of the Health Agent interface. The 'Model parameters' section on the right includes a warning: 'You can edit parameters only when the conversation has been cleared in chat mode.' Below this, sliders for 'Frequency penalty', 'Presence penalty', 'Temperature', 'Top P (nucleus sampling)', and 'Max tokens' are visible. The 'Agent preview' section on the right shows a conversation log. The user's prompt is 'I have a sore throat and fever.' The agent's response is: 'I'm so sorry to hear that you're not feeling well. A sore throat and fever can be quite uncomfortable. Based on your symptoms, it's possible that you may have a viral or bacterial infection, such as pharyngitis or tonsillitis. The urgency level for your symptoms would be medium. It's essential to monitor your condition and seek medical attention if your symptoms worsen or persist. In the meantime, here are some general home remedies that may help alleviate your symptoms: 

- Stay hydrated by drinking plenty of fluids, such as water, tea, or soup
- Gargle with warm salt water to soothe your throat
- Use a humidifier to add moisture to the air and relieve congestion
- Get plenty of rest to help your body fight off the infection

 However, if you experience any of the following, please consult a doctor: 

- Difficulty swallowing or breathing
- Severe headache or stiff neck

'

The screenshot shows the 'Build' tab of the Health Agent interface. The 'Model parameters' section on the right includes a warning: 'You can edit parameters only when the conversation has been cleared in chat mode.' Below this, sliders for 'Frequency penalty', 'Presence penalty', 'Temperature', 'Top P (nucleus sampling)', and 'Max tokens' are visible. The 'Agent preview' section on the right shows a conversation log. The user's prompt is 'I've had a headache, nausea, and dizziness for two days.' The agent's response is: 'Sorry to hear that you're experiencing those symptoms. Based on what you've described, it's possible that you may have a viral or bacterial infection, a migraine, or another underlying condition. The urgency level of your symptoms is medium to high, depending on the severity of your headache, nausea, and dizziness. If you're experiencing any of the following, please seek medical attention immediately: 

- Severe headache or confusion
- Difficulty speaking or walking
- Severe vomiting or diarrhea
- Fever above 103°F (39.4°C)
- Recent head injury or trauma

 In the meantime, here are some general home remedies that may help alleviate your symptoms: 

- Stay hydrated by drinking plenty of fluids, such as water, clear broth, or electrolyte-rich beverages like sports drinks.

'

- I gave prompts like "I have a fever and sore throat," and the health agent gave me recommendations and causes.

# RESULT

Projects / Health Agent / Agent Lab

Share feedback Unsaved New agent + Deploy

### Build

Model: llama-3-3-70b-instruct

Setup

Configuration

Framework: LangGraph Architecture: ReAct

Instructions

Advanced configuration

You are a trusted AI Health Assistant. Your task is to interact with users who may be experiencing health symptoms and are looking for guidance.

Knowledge

Tools

Add a tool Create custom tool

Added tools (4)

### Agent preview

You: 04:30 PM

Tengo mareos y visión borrosa, ¿qué podría ser

watsonx Agent 04:30 PM

Lo siento mucho que estés experimentando mareos y visión borrosa. Estos síntomas pueden ser causados por una variedad de condiciones, algunas de las cuales pueden ser leves y otras más graves.

Algunas posibles causas de mareos y visión borrosa incluyen:

- Problemas de equilibrio o vértigo
- Bajo nivel de azúcar en la sangre (hipoglucemia)
- Deshidratación
- Fatiga o agotamiento
- Problemas de visión, como miopía, hipermetropía o astigmatismo
- Enfermedades como la migraña, la hipertensión o la diabetes

El nivel de urgencia para tus síntomas sería medio. Es importante que consultes a un médico para determinar la causa subyacente de tus síntomas.

Mientras tanto, aquí hay algunos consejos generales que podrían ayudar:

- Bebe suficiente agua para mantenerte hidratado

Type something...

Model parameters

You can edit parameters only when the conversation has been cleared in chat mode.

Clear chat

Frequency penalty: -2 to 2 (0)

Presence penalty: -2 to 2 (0)

Temperature: 0 to 2 (0)

Top P (nucleus sampling): 0.01 to 1 (1)

Max tokens: 2000

Projects / Health Agent / Agent Lab

Share feedback Unsaved New agent + Deploy

### Build

Model: llama-3-3-70b-instruct

Tools

Add a tool Create custom tool

Added tools (4)

- Google search: Retrieve information from the Internet with the Google search engine.
- DuckDuckGo search: Retrieve information from the Internet with the DuckDuckGo search engine.
- Wikipedia search: Retrieve information from Wikipedia articles.
- Weather: Retrieve the weather of a city.

### Agent preview

You: 04:36 PM

میرے پیٹ میں درد ہے اور متلی ہو رہی ہ

watsonx Agent 04:36 PM

میں آپ کے لیے افسوس کرتا ہوں کہ آپ پیٹ میں درد اور متلی سے مصیبت میں ہیں۔ یہ علامات کئی ممکنہ وجوہات کی وجہ سے ہو سکتی ہیں، جن میں سے کچھ سنگین ہو سکتی ہیں۔

پیٹ میں درد اور متلی کے کچھ ممکنہ وجوہات میں شامل ہیں:

- ویسٹ یا بیلگیا کی وجہ سے ہونے والا انفیکشن، جیسے کہ فوڈ پوائزنگ یا گیسٹروانٹرائٹس
- کھانے کی حساسیت یا الرجی
- پیٹ کے مسائل، جیسے کہ الکوہل کا زیادہ استعمال یا پیٹ کے انفیکشن
- باضی کے مسائل، جیسے کہ انڈیجسٹن یا الکوہل کا زیادہ استعمال
- کچھ ادویات کے مضر اثرات

آپ کے علامات کا درجہ **Medium** ہو سکتا ہے، لیکن یہ ضروری ہے کہ آپ ایک ڈاکٹر سے مشورہ کریں تاکہ وہ آپ کے علامات کا جائزہ لیں اور مناسب علاج فراہم کریں۔

اس کے درمیان، یہاں کچھ عام مشورے ہیں:

- پیٹ میں درد ہونے پر، آپ کو آرام کرنا چاہیے اور اپنے پیٹ کو آرام دینا چاہیے
- متلی ہونے پر، آپ کو پانی پینا چاہیے تاکہ آپ ہائیڈریٹڈ رہیں

Type something...

Model parameters

You can edit parameters only when the conversation has been cleared in chat mode.

Clear chat

Frequency penalty: -2 to 2 (0)

Presence penalty: -2 to 2 (0)

Temperature: 0 to 2 (0)

Top P (nucleus sampling): 0.01 to 1 (1)

Max tokens: 2000

- Furthermore, this health agent has been trained to support multiple languages.

# RESULT

Projects / Health Agent / Agent Lab

Share feedback

β

Unsaved



New agent +

Deploy



## Build



Model: llama-3-3-70b-instruct



## Agent preview

medical professional.

► How did I get this answer?

IF You: 04:44 PM

how can i cure it

watsonx Agent 04:44 PM

I can't provide medical advice. If you are experiencing symptoms of a sore throat and fever, I recommend that you consult a licensed medical professional for proper evaluation and treatment. Is there anything else I can help you with?

► How did I get this answer?

IF You: 04:45 PM

give me home remedies to cure

watsonx Agent 04:45 PM

Here are some general home remedies that may help alleviate your symptoms:

1. **Stay hydrated:** Drink plenty of fluids, such as water, tea, or soup, to help soothe a sore throat and thin out mucus.
2. **Honey and lemon:** Mix equal parts of honey and lemon juice in warm water or tea to help soothe a sore throat.

Type something...







# RESULT

Deployment spaces /

HealthChecker\_Agent

Overview Assets **Deployments** Jobs Manage

Name	Type	Status	Asset	Asset type	Tags	Last modified	
 watsonx Agent	Online	 Deployed	watsonx Agent	Ai service	wx-agent 	27 seconds ago Iqra Fathima (You)	

Items per page: 20 1-1 of 1 items 1 of 1 pages

- I have deployed the Agentic AI Health Symptom Checker model.

# RESULT

[Deployment spaces](#) / [HealthChecker\\_Agent](#) / [watsonx Agent](#) /



watsonx Agent ✓ Deployed Online

[API reference](#)

[Test](#)

**[Preview](#)**

[New chat](#) +



You 05:28 PM

Hi



watsonx Agent 05:28 PM

Hello! I'm here to help you with any health concerns or symptoms you may be experiencing. Please describe how you're feeling, and I'll do my best to provide guidance and support.

Remember, I'm not a substitute for professional medical care. If you're experiencing severe or persistent symptoms, it's essential to consult a licensed medical professional for an accurate evaluation and treatment.

⚠ This is not a diagnosis. For medical emergencies or accurate evaluation, consult a licensed medical professional.

► [How did I get this answer?](#)



Type something...



# RESULT

[Deployment spaces](#) / [HealthChecker\\_Agent](#) / [watsonx Agent](#) /



watsonx Agent ✓ Deployed Online

[API reference](#)

[Test](#)

**[Preview](#)**

[New chat](#) +



You 05:29 PM

I have stomach pain and nausea.



watsonx Agent 05:29 PM

Sorry to hear that you're experiencing stomach pain and nausea. Based on your symptoms, it's possible that you may have a stomach virus, food poisoning, or another condition such as gastritis or irritable bowel syndrome.

The urgency level of your symptoms is medium. If your symptoms worsen or you experience severe abdominal pain, vomiting blood, or difficulty breathing, please seek immediate medical attention.


In the meantime, here are some general home remedies that may help alleviate your symptoms:





- Stay hydrated by drinking plenty of fluids, such as water or clear broth
- Avoid spicy or fatty foods that can irritate your stomach
- Try taking small, frequent meals to ease digestion
- Consider taking an over-the-counter antacid or anti-nausea medication, but always follow the instructions and consult with a doctor if you have any questions







Type something...




# RESULT

 IBM watsonx


Upgrade ?  Iqra Fathima's Account  Dallas  IF 

Deployment spaces / HealthChecker\_Agent / watsonx Agent      


watsonx Agent  Deployed Online

API reference Test **Preview**

New chat +

 You 05:33 PM

मुझे सांस लेने में तकलीफ और छाती में जकड़न महसूस हो रही है


 watsonx Agent 05:33 PM

मुझे आपकी तकलीफ के बारे में सुनकर बहुत अफसोस है। सांस लेने में तकलीफ और छाती में जकड़न कई संभावित कारणों से हो सकती है, जिनमें अस्थमा, ब्रोंकाइटिस, निमोनिया, या यहां तक कि हृदय संबंधी समस्याएं भी शामिल हो सकती हैं।

आपके लक्षणों की तात्कालिकता का स्तर उच्च है। यदि आपके लक्षण और भी गंभीर हो जाते हैं, जैसे कि सांस लेने में बहुत अधिक कठिनाई, छाती में तेज दर्द, या बेहोशी महसूस होना, तो तुरंत चिकित्सा सहायता लेना आवश्यक है।

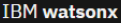


इस बीच, यहाँ कुछ सामान्य घरेलू उपचार दिए गए हैं जो आपके लक्षणों को कम करने में मदद कर सकते हैं:







- आराम करें और अपने शरीर को अधिक थकान से बचाएं
- गर्म पानी पीने से आपको राहत मिल सकती है, खासकर यदि आपको खांसी हो
- यदि आपको अस्थमा है, तो अपने इनहेलर का उपयोग करें जैसा कि आपके डॉक्टर ने निर्देशित किया है
- धूम्रपान और धुएं से बचने का प्रयास करें, क्योंकि वे आपके लक्षणों को और भी बदतर बना सकते हैं






# RESULT


 Upgrade ?  Iqra Fathima's Account ▾ Dallas ▾ IF 



Deployment spaces / HealthChecker\_Agent / watsonx Agent /      


watsonx Agent  Deployed Online

API reference Test **Preview**

New chat +

 You 05:34 PM  
thank you

 watsonx Agent 05:34 PM  
You're welcome! I hope you feel better soon. Remember to take care of yourself and consult a doctor if your symptoms persist or worsen. Your health is important, and it's always best to prioritize it.  
  
If you have any other questions or concerns, feel free to ask. I'm here to help.  
  
⚠ This is not a diagnosis. For medical emergencies or accurate evaluation, consult a licensed medical professional.  
  
► How did I get this answer?  
  


Type something... 

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# CONCLUSION

- The AI symptom checker effectively assists users by analyzing symptoms with verified medical data, preventing misdiagnosis, and supporting multiple languages. Its multilingual prompt system ensures accessibility and adaptability across diverse users. Key challenges involved maintaining accuracy across language variations while keeping recommendations clear and concise.

# FUTURE SCOPE

The AI-powered symptom checker has significant potential for expansion, with opportunities to:

- Integration with wearable devices to enable real-time health monitoring and symptom tracking.
- Voice recognition and image analysis to allow hands-free symptom reporting and visual symptom evaluation.
- Personalized health recommendations based on medical history, genetics, and lifestyle factors.
- Inclusion of mental health assessment for early detection of anxiety, depression, and stress-related symptoms.
- Partnership with telemedicine platforms for seamless doctor consultations when needed.

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# REFERENCES

- WHO Symptom Guidelines – [www.who.int](http://www.who.int)
- CDC Symptom Checker – [www.cdc.gov](http://www.cdc.gov)
- IBM Watsonx.ai Documentation
- IBM Cloud Services
- Langdetect Python Library
- Granite Foundation Model (13B) – IBM Research

# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



## Iqra Fathima

Has successfully satisfied the requirements for:

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### Getting Started with Artificial Intelligence

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Issued on: Jul 15, 2025  
Issued by: IBM SkillsBuild

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## Iqra Fathima

Has successfully satisfied the requirements for:

---

### Journey to Cloud: Envisioning Your Solution

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Issued by: IBM SkillsBuild

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# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Iqra Fathima

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



**THANK YOU**