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# CAPSTONE PROJECT

## AI AGENT FOR CHRONIC DISEASE MONITORING

**Presented By:**  
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# OUTLINE

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

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# PROBLEM STATEMENT

Chronic diseases such as diabetes, hypertension, and heart conditions require regular monitoring and timely interventions. Many patients struggle to manage their conditions due to lack of awareness, missed symptoms, or poor medication adherence. There is a pressing need for a personalized, accessible, and intelligent system to help patients and caregivers monitor health trends, detect early warning signs, and receive guided support—all without relying on physical devices.

# PROPOSED SOLUTION

- The proposed solution is a cloud-based conversational AI agent that acts as a virtual health assistant. Through natural dialogue, it collects simulated patient data (e.g., age, blood pressure, glucose levels, symptoms) and provides:
  - ❖ Early risk alerts for chronic conditions
  - ❖ Lifestyle and medication suggestions
  - ❖ Personalized, interactive health advice
  - ❖ A knowledge-grounded system for trustworthy outputs
- This agent is designed to function without hardware, using IBM Watsonx and foundation models for intelligent interaction.

# SYSTEM APPROACH

- **System Requirements:**

- ❖ IBM Cloud Lite Account
- ❖ Internet-enabled browser
- ❖ Patient health data inputs (simulated)

- **Libraries/Resources Used:**

- ❖ Watsonx.ai (for Agentic AI)
- ❖ Granite/Mistral large language model
- ❖ Vector Index (knowledge grounding)
- ❖ Prompt engineering (healthcare-focused dialogues)

- **Knowledge Base:**

- ❖ Uploaded documents on hypertension, diabetes, and heart disease management
- ❖ Simple structured guidance on symptoms, ranges, and health tips

# ALGORITHM & DEPLOYMENT

- **Model Used:**  
Foundation language model (IBM Granite or Mistral) deployed via Watsonx.ai
- **Input:**
  - ❖ Age
  - ❖ BP readings
  - ❖ Glucose level
  - ❖ Reported symptoms
- **Processing:**
  - ❖ Prompt-based reasoning with condition-specific logic
  - ❖ Retrieval-Augmented Generation using a vector index of healthcare knowledge
  - ❖ Grounded response generation for alerts and tips
- **Deployment:**
  - ❖ Agent created and deployed through Watsonx.ai
  - ❖ Integrated with a preview environment for simulation and testing
  - ❖ Available through conversational UI within IBM Cloud

# RESULT

IBM watsonx

Upgrade ?

Madhuhrita Saha's Account

Dallas

MS

Deployment spaces / SymptoTrack / SymptoTrack /

SymptoTrack ✓ Deployed Online

API reference Test **Preview**

New chat +

M

You 10:00 PM

Can you help me track my chronic condition?

SymptoTrack 10:00 PM

Of course! I'm here to assist you in managing your chronic condition. To provide the best support, I'll need some information from you.

1

 Could you please tell me your age? 

2

 What was your most recent blood pressure reading? 

3

 Do you know your latest blood glucose level? 

4

 Are you experiencing any symptoms right now? 

5

 Do you have any diagnosed chronic conditions?

Once you provide these details, I can help analyze them and offer guidance based on the Chronic Disease Knowledgebase.

M

You 10:02 PM

1. 19 yrs

Type something...

About this deployment

Name

SymptoTrack

Description

Your virtual health buddy—sharing tips, alerts & care advice based on how you feel today.

Deployment Details

Deployment ID: 3214dc46-7c04-41...

Serving name

No serving name.

Software specification

runtime-24.1-py3.11

Hardware specification

Extra extra small: 1 CPU and 2 GB RAM

Copies

1

Tags

wx-agent

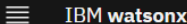
Associated asset



SymptoTrack

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edunet  
foundation

# RESULT

 IBM watsonx


Upgrade ?  Madhuhrita Saha's Account ▾ Dallas ▾ MS 

Deployment spaces / SymptoTrack / SymptoTrack /

SymptoTrack  Deployed Online

API reference Test **Preview**

New chat +



 SymptoTrack 10:02 PM  
Thank you for providing your information. Here's what we have:

- Age: 19 years
- Blood Pressure: 110/65 mmHg
- Blood Glucose: Not available
- Symptoms: Fatigue
- Diagnosed Conditions: Not specified


Given your age and blood pressure reading, it's good to see that your blood pressure is within the normal range (less than 120/80 mmHg is considered optimal for young adults). However, you mentioned experiencing fatigue. Fatigue can be a symptom of various conditions, not just chronic diseases. It could be due to factors like lack of sleep, stress, poor nutrition, or intense physical activity.


I would recommend you to:









1. Ensure you're getting enough sleep.
2. Stay hydrated and maintain a balanced diet.

Type something...  

About this deployment ×


**Name**   
SymptoTrack





**Description**   
Your virtual health buddy—sharing tips, alerts & care advice based on how you feel today.







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Extra extra small: 1 CPU and 2 GB RAM  
Copies:   
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**Tags**   
wx-agent  
**Associated asset**   
 SymptoTrack  
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# RESULT



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Deployment spaces / SymptoTrack / SymptoTrack /      

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API reference Test **Preview**

New chat +


I would recommend you to:



1. Ensure you're getting enough sleep.
2. Stay hydrated and maintain a balanced diet.
3. Engage in regular, moderate physical activity.
4. Manage stress levels through relaxation techniques or hobbies.


If your fatigue persists or worsens, it would be advisable to consult with a healthcare professional for a thorough evaluation. They might want to check for anemia, thyroid issues, or other underlying conditions.


For now, keep monitoring your blood pressure and any other vital signs, and let me know if you have any other concerns or if your condition changes.


► How did I get this answer?











Type something...  

About this deployment 

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SymptoTrack

**Description**   
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**Deployment Details**  
Deployment ID: 3214dc46-7c04-41...  
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edunet  
foundation

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# CONCLUSION

The AI-based chronic disease monitoring chatbot successfully engages users, simulates health tracking, and provides grounded, helpful suggestions. Without the need for hardware, it showcases the potential of cloud-hosted LLMs in healthcare support. The system simplifies chronic care education, encourages proactive health habits, and enables users to seek help before emergencies arise.

# FUTURE SCOPE

- Expand dataset to support more diseases (e.g., asthma, COPD)
- Add multilingual support for accessibility
- Integrate voice assistant capability
- Build a web/app frontend for wider adoption
- Improve personalization with user profiles and longitudinal tracking
- Explore secure integration with EMR (Electronic Medical Records)

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# REFERENCES

- WHO: Chronic Disease Management Guidelines
- CDC.gov – Heart Disease & Diabetes Resources
- MedlinePlus & Mayo Clinic Patient Guides
- IBM Documentation on Watsonx.ai and Vector Index
- Project Knowledge Base (self-authored)
- Dataset: UCI & Kaggle (for testing prompts)

# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Madhuhrita Saha

for the completion of

**Introduction to Artificial Intelligence**

(MDL-211)

According to the Moodle system of record

**Completion date:** 19 Jul 2025 (GMT)

**Learning hours:** 1 hr 15 mins

# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to  
**Madhuhrita Saha**

for the completion of

**Journey to Cloud: Envisioning Your Solution**

(MDL-447)

According to the Moodle system of record

**Completion date:** 21 Jul 2025 (GMT)

**Learning hours:** 5 hrs

# IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Madhuhrita Saha

for the completion of

**Lab: Retrieval Augmented Generation with  
LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 24 Jul 2025 (GMT)

**Learning hours:** 20 mins



**THANK YOU**