
CAPSTONE PROJECT

AI AGENT FOR CHRONIC DISEASE MONITORING

Presented By:

1. Harikrishna Ramesh-Federal institute of Science And Technology-CS

OUTLINE

- **Problem Statement**
- **Proposed System/Solution**
- **System Development Approach (Technology Used)**
- **Result**
- **Conclusion**
- **Future Scope**
- **References**

PROBLEM STATEMENT

Chronic diseases like diabetes, hypertension, and heart conditions require continuous monitoring and proactive care. Many patients and healthcare providers lack real-time access to health data and early warning systems, resulting in delayed intervention, poor treatment adherence, and increased hospital visits. There is a need for an AI-based assistant to bridge the gap between patient data and timely insights..

PROPOSED SOLUTION

The proposed solution is an AI agent built on IBM Cloud using Watsonx.ai . This intelligent assistant will:

- Continuously monitor patient health data (e.g., blood pressure, glucose level, heart rate).
- Analyze inputs using AI to detect early warning signs.
- Provide personalized lifestyle recommendations and medication reminders.
- Support real-time alerts to both patients and healthcare providers.
- Enhance chronic care outcomes by enabling proactive and informed health management.

SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing the rental bike prediction system. Here's a suggested structure for this section:

- **System requirements**

- Laptop 64x based

- **Library required to build the model**




- IBM Cloud (Lite)




- Watsonx.ai Agentic Lab(AI Agent)

- Watsonx.ai Runtime


- No-code AI agent builder on IBM Cloud

RESULT


[Upgrade](#)   Harikrishna Ramesh's Acco... [Dallas](#) [HR](#) 

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

Agent preview

 You: 01:55 PM

Patient has a blood pressure reading of 160/100 mmHg. What should they do?

 Chronic_disease_agent 01:55 PM


Based on the search results, it appears that a blood pressure reading of 160/100 mmHg is considered stage 2 hypertension. The American Heart Association recommends that individuals with stage 2 hypertension work with their healthcare provider to develop a treatment plan, which may include lifestyle changes and medication.




Some possible steps that the patient could take include:

- Consulting with their healthcare provider to discuss their treatment options
- Making lifestyle changes such as increasing physical activity, reducing sodium intake, and managing stress
- Monitoring their blood pressure regularly to track any changes
- Considering medication to help lower their blood pressure

It's important for the patient to work closely with their healthcare provider to develop a personalized treatment plan that takes into account their individual needs and health status.




► [How did I get this answer?](#)







Test Case 1: Hypertension Warning

RESULT


[Upgrade](#)   Harikrishna Ramesh's Acco... ▾ Dallas ▾ HR 

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

Agent preview

 You: 02:19 PM

Glucose level is 210 mg/dL after lunch. The patient also reports fatigue.

 Chronic_disease_agent 02:19 PM

Based on the search results, it appears that high blood sugar levels can cause fatigue, and it's a common symptom of diabetes. The Mayo Clinic website states that high blood sugar disrupts the body's ability to use sugar for energy, leading to fatigue. Additionally, the website Verywell Health mentions that blood sugar swings can also cause fatigue in people with normal blood sugar levels.





It's important to note that fatigue can be a symptom of other conditions as well, so it's always best to consult with a healthcare professional for proper diagnosis and treatment. They can help determine the underlying cause of the fatigue and provide guidance on how to manage it.

In the meantime, here are some general tips that may help alleviate fatigue:

- Stay hydrated by drinking plenty of water
- Get regular exercise, such as walking or light stretching
- Eat a balanced diet that includes plenty of fruits, vegetables, and whole grains
- Get enough sleep each night, aiming for 7-8 hours
- Manage stress through techniques like meditation or deep breathing

Remember, it's always best to consult with a healthcare professional for personalized advice on managing fatigue and high blood sugar levels.

[► How did I get this answer?](#)

Test Case 2: Diabetic Patient Alert

RESULT

Upgrade?🔔

Harikrishna Ramesh's Account

Dallas

HR

Share feedback

Unsaved

New agent

Deploy

<

Agent preview

HR

You: 02:25 PM

Patient is prediabetic and asks how to lower blood sugar naturally.

Chronic_disease_agent

02:25 PM

To lower blood sugar naturally, consider the following tips:

1. Drink more water to help control blood glucose levels.

2. Practice mindful eating and incorporate fiber-rich foods into your diet.

3. Lose excess weight and adopt a healthy diet.

4. Cut back on added sugars.

5. Consider taking chromium supplements, as they may help lower blood sugar levels.

It's also important to note that prediabetes can be reversed with lifestyle changes and proper treatment. Consult with a healthcare professional for personalized advice

► How did I get this answer?

🔄

type something...

🔍

🗑️

➤

Test Case 4: Lifestyle Suggestion

SET UP

Build

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



Setup



Name

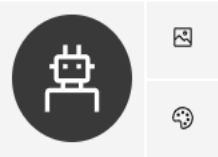
Chronic_Care_Assistant

Description

73/100

An AI health assistant designed to help patients manage chronic diseases.

Icon



Placeholder image



Quick start questions

Add up to 4 quick start questions that your users can select.



CONFIGURATION

Advanced configuration

Agent instructions

Common instructions

Agent instructions are unique to this agent and will affect its specific behavior.

You are a helpful and medically aware AI assistant that monitors chronic diseases such as diabetes, hypertension (high blood pressure), and heart disease.

You analyze patient input data like:

- Blood sugar (glucose level)
- Blood pressure
- Heart rate
- Symptoms (e.g., dizziness, fatigue, chest pain)
- Medical history and lifestyle (e.g., smoking, diet, activity level)

Your tasks:

1. Detect any early signs of risk or abnormal health readings.
2. Provide clear and simple health insights and recommendations.
3. Send medication or appointment reminders.
4. Recommend lifestyle changes like diet, exercise, or hydration.
5. Always be supportive, avoid giving direct diagnosis, and tell users to consult a doctor if necessary.

Ca

TOOLS

Build

AI

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

Knowledge

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.

edunet
foundation

DEPLOYED

IBM watsonx

Upgrade ? Bell

Harikrishna Ramesh's Acco... Dallas HR

Deployment spaces / Chronic_Care_Assistant / Chronic_Care_Assistant /

Chronic_Care_Assistant

Deployed Online

API reference

Test


Preview

New chat +

Chronic_Care_Assistant 05:13 PM

Welcome to Chronic_Care_Assistant

An AI health assistant designed to help patients manage chronic diseases.



Type something... Send

DEPLOYED OUTPUT



You: 05:28 PM

Glucose level is 210 mg/dL after lunch. The patient also reports fatigue.



Chronic_Care_Assistant 05:28 PM

Based on the search results, it appears that high blood sugar levels can cause fatigue, and it's a common symptom of diabetes. The Mayo Clinic website states that high blood sugar disrupts the body's ability to use sugar for energy, leading to fatigue. Additionally, the website Verywell Health mentions that blood sugar swings can also cause fatigue in people with normal blood sugar levels.

It's important to note that fatigue can be a symptom of other conditions as well, so it's essential to consult a doctor to determine the underlying cause of the fatigue. The doctor may recommend lifestyle changes, such as diet and exercise, to help manage blood sugar levels and alleviate fatigue.

In terms of specific recommendations, the website Healthline suggests that people with diabetes should aim to keep their blood sugar levels within a target range to prevent fatigue. The website also recommends getting regular exercise, eating a balanced diet, and staying hydrated to help manage blood sugar levels and reduce fatigue.

Overall, it seems that high blood sugar levels can contribute to fatigue, and managing blood sugar levels through lifestyle changes and medical treatment can help alleviate fatigue. However, it's essential to consult a doctor to determine the underlying cause of the fatigue and develop a personalized plan to manage it.

► How did I get this answer?



Type something...



CONCLUSION

- This AI agent demonstrates the potential of IBM Cloud and Watsonx.ai in transforming chronic disease management. By providing real-time monitoring, intelligent recommendations, and proactive alerts, the agent reduces risks, improves treatment adherence, and bridges the communication gap between patients and providers.

FUTURE SCOPE

- Integration with real wearable data from smartwatches and glucometers
- Use of real-time patient dashboards for doctors
- Expansion to cover mental health, cancer follow-up, etc.
- Use of IBM App Connect to automate data flow
- Voice interaction using Watson Assistant

REFERENCES

- IBM Watsonx.ai Documentation
- IBM Granite Foundation Models
- Research papers on AI in healthcare monitoring

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Harikrishna Ramesh

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 18, 2025

Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/730cc9c2-175d-4e0b-ac59-510c3940f3bd>



IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Harikrishna Ramesh

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution



Issued on: Jul 21, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/26b3c321-7ccc-42aa-af64-e591e45fb285>



IBM CERTIFICATIONS

7/24/25, 9:49 PM

Completion Certificate | SkillsBuild

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to
Harikrishna Ramesh

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