
■ Generative AI Project using IBM Cloud – HEALTHAI

◇ Project Documentation Format

1. Project Overview

- **Purpose:**

To build a Generative AI-based healthcare assistant using IBM Granite, capable of answering health queries, predicting diseases, suggesting treatments, and displaying analytics.

- **Features:**

-  AI Health Chat using IBM Granite ○  Disease Prediction from user symptoms
-  Treatment Plan Suggestions

 Health Analytics Dashboard ○  Centralized shared model

for performance optimization

2. Architecture

- **Frontend:**

Built using **Streamlit** for a clean and responsive web interface. Each feature is modularized for easy navigation via sidebar.

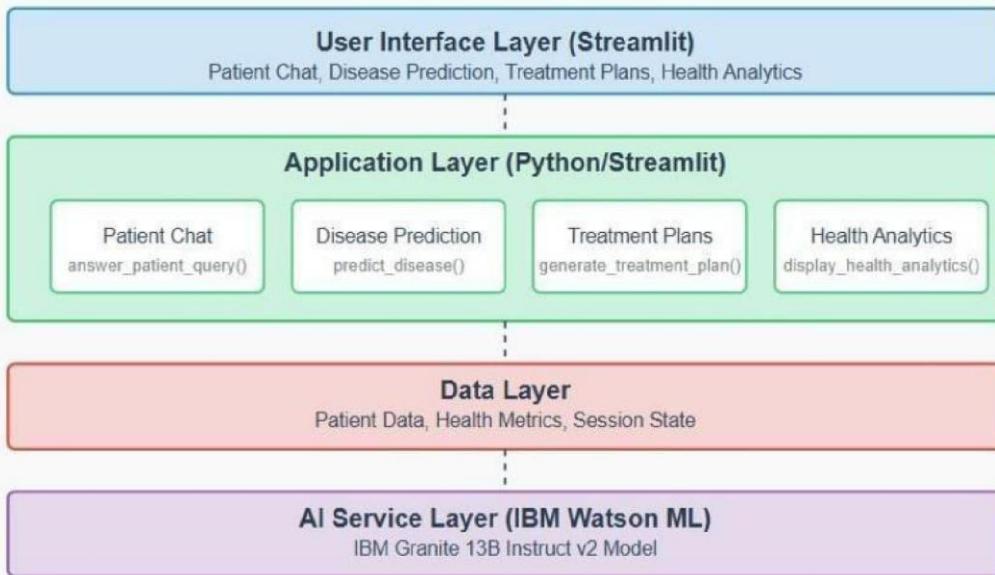
- **Backend & Model:**

- No traditional backend. All logic handled in Streamlit using Python.
- Uses **IBM Granite 3-2b Instruct model** from IBM Watsonx: ibm-granite/granite-3.2b-instruct ○ Supports both API and **local model loading** (granite/folder).

- **Shared Model Loader:**

The shared_model.py file centrally loads and shares the AI model across modules to prevent memory crashes and redundancy.

HealthAI - Architecture Diagram



4. Setup Instructions

Prerequisites

- Python 3.10+
- pip
- IBM cloud account and Streamlit Community Cloud account
- Installed model files if using local (granite/ folder) **Installation**

git clone: https://github.com/KESANI-SANTHOSH-KUMAR/HealthCare_AI.git

cd Healthai pip install -r requirements.txt

Environment Variables

Create a .env file in the root folder:

IBM watsonx_API_Key= ESdPliW78JY8LM32Vp6ujw_EVP1dySvqb5ZQ5lc7K4wi

.env file must be excluded in .gitignore.

5. Folder Structure

Health-ai/



```
|--- app.py          # Main entry point  
|--- shared_model.py    # Shared AI model instance  
|--- patient_chat.py    # AI Health Chat module  
|--- disease_prediction.py  # Disease Prediction logic  
|--- treatment_plans.py   # Treatment Plan suggestions  
|--- health_analytics.py  # Analytics module  
|--- requirements.txt     # Python dependencies  
|--- .env              # API token (not pushed to GitHub)  
|--- granite/          # [Optional] Local model folder  
└--- assets/           # Logos and screenshots
```

6. Running the Application For IBM watsonx API: streamlit run

app.py

For Local Model:

Ensure granite/ folder contains the downloaded model and tokenizer files.

In shared_model.py, update: model_path = "./granite"

7. API Documentation

Endpoint: <https://eu-de.ml.cloud.ibm.com/ml/v1/text/chat?version=2023-05-29> **Headers:**

```
{  
  "Authorization": "Bearer <IBM _API_Key>",  
  "Content-Type": "application/json"  
}
```

Example Request:

```
{  
  "inputs": "What are the symptoms of diabetes?"  
}
```

Example Response:



```
{  
  "generated_text": "Common symptoms of diabetes include frequent urination..."  
}
```

8. Authentication

- Streamlit cloud Secrets is securely stored the .env credentials.
 - .env is excluded via .gitignore
 - App is currently public and stateless (no user login)
 - HuggingFace or Firebase Auth can be added in future
-

9. User Interface

- Built entirely with **Streamlit**
 - Sidebar for navigation
 - Text/chat inputs for interaction
 - Visual graphs and health tips in Analytics
 - Centralized theme and branding
-

10. Testing

- Manual testing across all modules
- Model tested with varied prompts and edge cases
- Handled errors for invalid inputs and model timeouts



11. Screenshots or Demo



• OUTPUT :



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HealthAI - Intelligent Healthcare Assistant

Patient Profile

Name: [REDACTED]
Age: 30
Gender: Male
Medical History: [REDACTED]
Current Medications: [REDACTED]

AI-Powered Healthcare Assistant

Enter your health concern:
I am feeling ill

Know what is the problem

1. Assess the severity of symptoms:

- Have you experienced fever, chills, or body aches?
- Are you experiencing shortness of breath or chest pain?
- Have you noticed changes in your appetite or sleep patterns?

2. Home remedies for mild symptoms:

- If you're experiencing a common cold or flu:
 - Stay hydrated by drinking plenty of fluids (water, herbal tea, etc.)
 - Rest and take adequate sleep to boost your immune system.

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HealthAI - Intelligent Healthcare Assistant

Patient Profile

Name: [REDACTED]
Age: 30
Gender: Male
Medical History: [REDACTED]
Current Medications: [REDACTED]

AI-Powered Healthcare Assistant

Enter symptoms (comma-separated):
headache, bodypains, nose bleeding

Predict Disease

Top 3 likely diagnoses with estimated likelihoods:

1. Migraine: 70%
2. Tension headache: 20%
3. Sinusitis: 10%

Explanation: Migraine and tension headaches are common causes of headaches and body pains, often accompanied by nosebleeds due to increased blood vessel sensitivity. Sinusitis, while also causing headaches and body pains, is less likely given the absence of other typical symptoms like facial congestion or thick nasal discharge. However, the likelihood of sinusitis can increase if the patient has a history of recurrent sinus infections or if other symptoms suggest a sinus-related issue.

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Patient Profile

Name: [Input Field]

Age: 30

Gender: Male

Medical History: [Input Field]

Current Medications: [Input Field]

Allergies: [Input Field]

Get Treatment Plan

Enter diagnosed disease: migraine

disease: migraine

Treatment Plan:

- First-line medication: Acute treatment with over-the-counter pain relievers (e.g., ibuprofen, naproxen) or prescription-strength triptans (e.g., sumatriptan, rizatriptan).
 - For mild to moderate migraines, start with an over-the-counter pain reliever. If symptoms persist or worsen, proceed to triptans.
 - Triptans should be taken as soon as possible after the onset of migraine symptoms.
- Supportive care:
 - Ensure adequate hydration and rest.
 - Consider using non-pharmacological interventions such as:
 - Cold or warm compress on the head or neck.
 - Ginger or other natural remedies (consult a healthcare provider before use).
 - Relaxation techniques, deep breathing, or biofeedback.
- When to escalate to a healthcare provider:
 - If acute medication fails to provide relief within 2 hours.

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Health Analytics Dashboard

Name: [Input Field]

Age: 30

Gender: Male

Medical History: [Input Field]

Current Medications: [Input Field]

Allergies: [Input Field]

Save Profile

Upload your health data (CSV or Excel)

Drag and drop file here
Limit 200MB per file • CSV, XLSX

Browse files

health_data_with_symptoms.csv 291.0B

Raw Data

	Date	HeartRate	SystolicBP	DiastolicBP	BloodGlucose	Symptom
0	2024-01-01	72	120	80	95	Headache
1	2024-01-02	78	122	82	105	Fatigue
2	2024-01-03	85	130	88	110	Dizziness
3	2024-01-04	90	135	85	98	Headache
4	2024-01-05	76	118	76	92	Nausea
5	2024-01-06	70	115	75	89	Fatigue
6	2024-01-07	88	140	90	120	Dizziness

Data Summary

Date	HeartRate	SystolicBP	DiastolicBP	BloodGlucose	Symptom
2024-01-01	72	120	80	95	Headache
2024-01-02	78	122	82	105	Fatigue
2024-01-03	85	130	88	110	Dizziness
2024-01-04	90	135	85	98	Headache
2024-01-05	76	118	76	92	Nausea
2024-01-06	70	115	75	89	Fatigue
2024-01-07	88	140	90	120	Dizziness

Manage app



12. Known Issues

- ⌚ Generic model outputs due to lack of medical domain fine-tuning
- ⌚ Internet dependency when using IBM watsonx.
- ⌚ No data persistence (currently stateless app)

13. Future Enhancements

- Add user authentication and patient record storage
 - Multilingual prompt support
 - Mobile version of the app
 - Integrate with real-time health APIs or EHRs
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