HealthAI: Intelligent Healthcare Assistant Using IBM Granite

PROJECT TITLE : **HealthAI: Intelligent Healthcare Assistant Using IBM Granite**

TEAM SIZE : **4**

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VIRTUAL INTERSHIP PROGRAM

Intership details : **Generative AI with IBM Cloud**

Internz : **Smart Internz & IBM**

Company : **Smart Bridge powdered by Smart Internz**

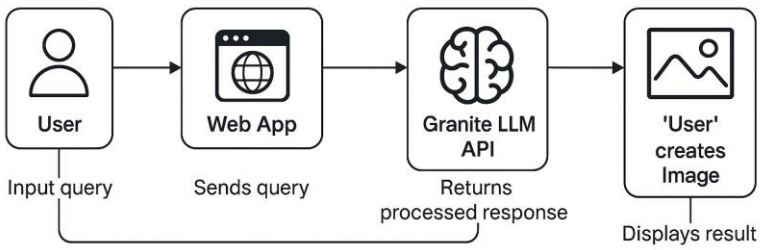
Introduction

Project Overview
HealthAI is a real-time intelligent healthcare assistant built using Python, Streamlit, and OpenAI/IBM Granite. It simulates doctor-like responses, predicts diseases, suggests treatments, and visualizes health metrics. It demonstrates how AI can be leveraged to provide meaningful health advice with a simple UI.
Purpose
To leverage IBM's Granite LLM for building a reliable, accessible, and AI-powered health assistant that aids users in health-related queries efficiently and securely**.**

Ideation Phase

Problem Statement:
Many individuals struggle to access quick and reliable health guidance, especially in remote or underserved areas. HealthAI bridges this gap using AI-powered assistants.
Empathy Map Canvas:
Think & Feel: Wants accurate medical advice
See: Too much online misinformation
Say & Do: Seeks help through apps
Hear: Concerns about trust in AI
Pain: Long wait times at clinics
Gain: Fast and trusted guidance
Brainstorming:
Use AI/ML for health Q&A
Integration with IBM Granite
Chat interface for ease of access

Data Flow Diagram:



Reqirement Analysis

Customer Journey Map:
User opens app → asks question → receives response → gets suggestions

Solution Requirements:
- AI model: IBM Granite
- Backend: Python, Flask/FastAPI
- Frontend: HTML/CSS/JS or Streamlit
- Database (optional)

Declaration

We hereby declare that the project titled "HealthAI: Intelligent Healthcare Assistant Using OpenAI" is the result of our original work completed under the guidance of SmartInternz and IBM. It has not been submitted elsewhere for any academic or professional recognition. All development, documentation, and implementation tasks were carried out with sincerity and adherence to academic integrity.

Acknowledgment

We express our heartfelt gratitude to SmartInternz and IBM for providing us this opportunity to work on an industry-relevant guided project. We also thank our faculty members and mentors for their continuous support, technical guidance, and valuable feedback throughout the course of this project.

Abstract

HealthAI is a real-time intelligent healthcare assistant that enables users to interact with an AI system to receive health-related information. Built with Python, Streamlit, and OpenAI, the system offers personalized responses to health queries, provides AI-powered disease predictions based on symptoms, suggests treatment guidelines, and visualizes patient data through insightful graphs. It serves as an educational and awareness tool, empowering users to make informed decisions about their health.

¦ Problem Statement

Access to timely and professional medical advice remains a challenge for many, especially in rural and underserved communities. HealthAI aims to bridge this gap by offering a virtual assistant capable of providing preliminary health guidance, improving awareness, and reducing dependence on overburdened healthcare systems. It acts as a first point of reference before seeking clinical care.

🛠 Tools and Technologies Used

Tool/Technology	Purpose
Python	Backend logic and data processing
Streamlit	Web interface development and deployment
OpenAI (ChatGPT)	AI-based natural language understanding and response generation
Pandas	Health data manipulation and storage
Plotly	Health metric visualization through dynamic graphs
GitHub	Version control and collaborative development
SmartInternz Platform	Project structure, guidance, and submission support

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🧩 Modules Implemented

Patient Chat – Offers interactive, AI-generated responses to user health queries using prompt engineering and natural language processing.

Disease Prediction – Accepts symptoms from users and predicts possible conditions using symptom-based AI analysis.

Treatment Plans – Provides standard medical guidance and lifestyle suggestions for known medical conditions.

Health Analytics – Visualizes user health data trends like blood pressure, glucose levels, and heart rate, with AI-generated insights for better health tracking.

How to Use the HealthAI Application

1. Open App:HealthAI Streamlit App
   (https://healthaiproject-9zncftohtgbtxnwcvrkdss.streamlit.app/)

2. Choose Feature: Patient Chat / Disease Prediction / Treatment Plans / Health Analytics
3. Input Data: Type symptoms or condition
4. Submit: Click generate
5. Output: Get response from AI instantly

Sample Module Outputs

Home Page:

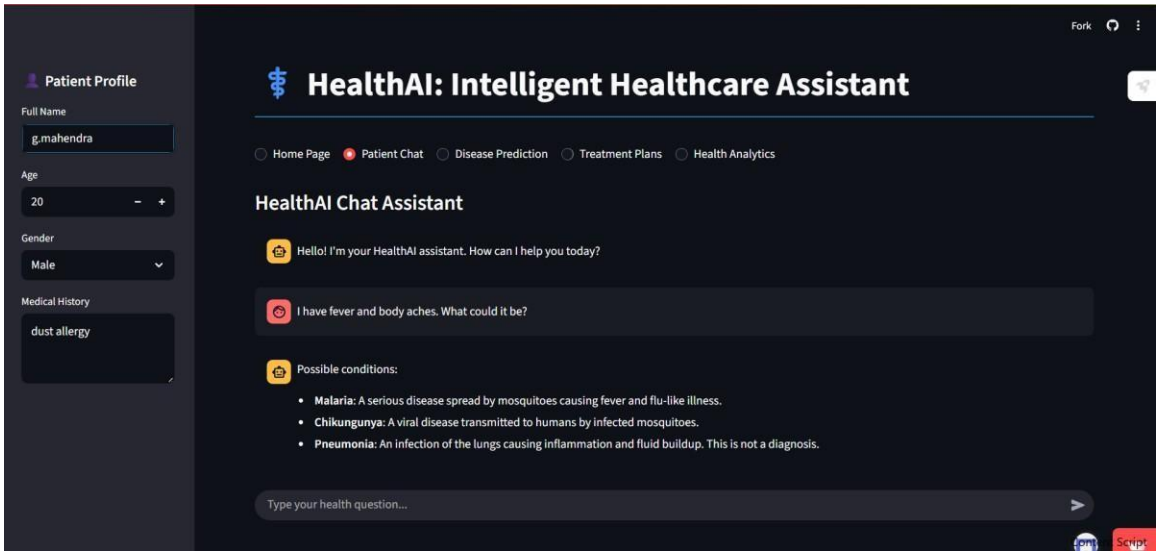
The **HealthAI homepage** provides an intuitive interface with quick access to modules like Patient Chat, Disease Prediction, Treatment Plans, and Health Analytics. It displays patient details and allows users to begin interacting with the AI assistant immediately.

HealthAI: Intelligent Healthcare Assistant

Welcome to HealthAI, your virtual healthcare companion powered by AI.
This application provides:

- Real-time medical chat support using AI
- Disease predictions based on symptoms
- Personalized treatment plan suggestions
- Health data analytics and trends

< Module 1: Patient Chat



User: I have fever and body aches.What could it be?
HealthAI :

- Malaria: A serious disease spread by mosquitoes causing fever and flu-like illness.
- Chikungunya: A viral disease transmitted to humans by infected mosquitoes.
- Pneumonia: An infection of the lungs causing inflammation and fluid buildup. This is not a diagnosis

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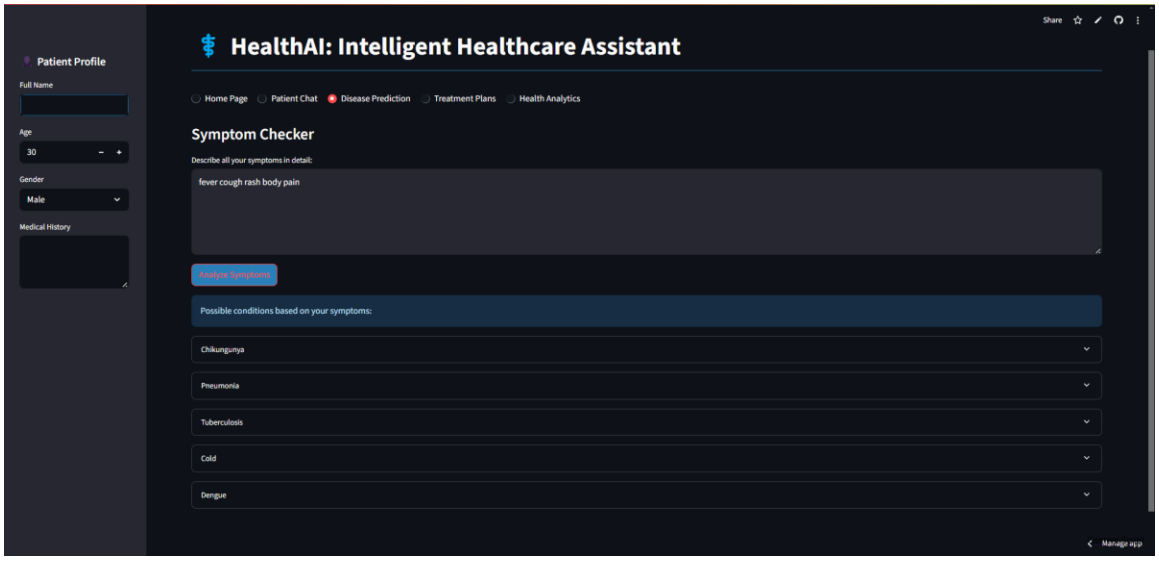
`^ Module 2: Disease Prediction



User: fever,cough,rash,body pain

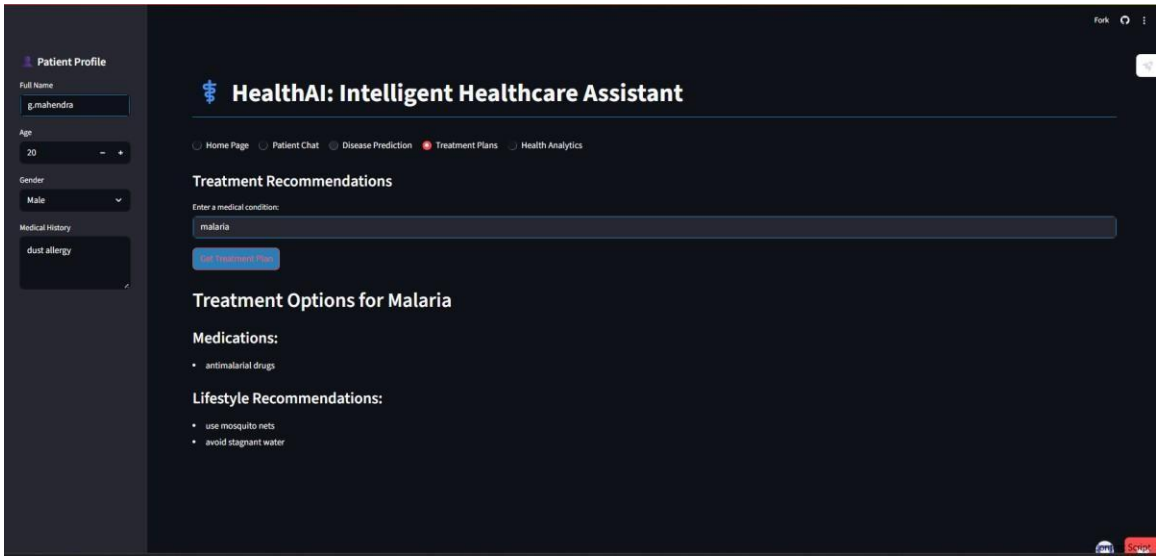
HealthAI :

Analyze Symptoms

Possible conditions based on your symptoms:

- Chikungunya
- Pneumonia
- Tuberculosis
- Cold
- Dengue

Module 3: Treatment Plans



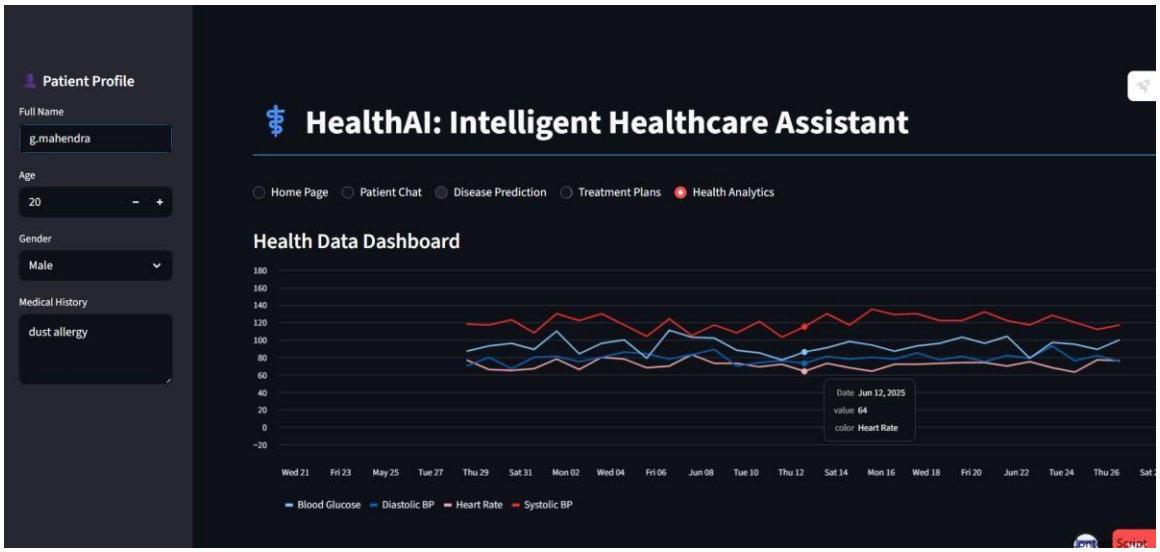
Treatment Recommendations
Enter a medical condition:
• Malaria

Treatment Options for Malaria
• Medications:
• antimalarial drugs

Lifestyle Recommendations:
• use mosquito nets
• avoid stagnant water

Module 4: Health Analytics

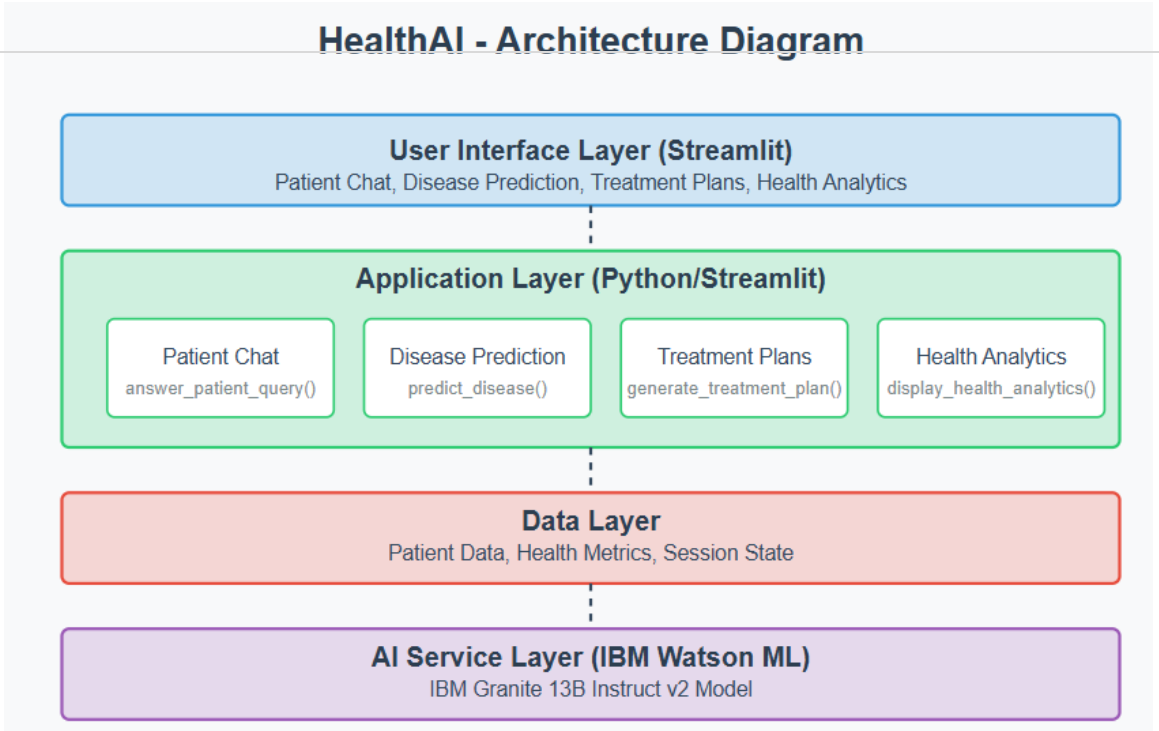
Displays 30-day trends of Heart Rate, BP, Glucose with insights.



Technical Architecture

Proposed Solution:

Interactive chatbot powered by IBM Granite that processes symptoms and suggests outcomes



Project Planning & Scheduling

Day 1: Research&Planning
Day 2: Backend & AI Integration
Day 3: Frontend Design
Day 4: Testing & Debugging
Day 5: Documentation

Project Workflow

- Requirement Gathering
- AI Model Selection
- UI/UX Planning
- Development (Frontend + Backend)
- Integration & Testing
- Deployment
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Milestone 1: Model Selection and Architecture

We selected OpenAI GPT-3.5 for its powerful conversational abilities. Backend and frontend were designed to interact through clean APIs and modular components.

Milestone 2: Core Functionalities Development

Each module was developed independently:
- AI chat for general queries
- Symptom-based disease prediction
- Condition-based treatment planning
- Time-based health data visualization

App.py Development

This main file handles routing, input collection, response display, and connects user interactions to utility logic and the OpenAI model.

UI Design

User interface is built using Streamlit's built-in widgets and layout elements. Simple yet modern layout using sidebar, form inputs, charts, and response sections.

Deployment

Hosted on Streamlit Cloud. Environment variables securely stored. GitHub for code management and team collaboration.

Future Scope

-Connect with verified doctors
-Use wearable IoT devices
-Add user login and history
-Deploy on cloud with authentication

Advantages & Limitations

Advantages:
Instant AI responses
Easy-to-use interface
Based on reliable IBM/OpenAI models

Limitations:
No real-time doctor verification
Requires internet
Accuracy depends on model training

Conclusion

HealthAI was a hands-on experience in building AI-integrated health apps. We learned prompt engineering, Streamlit deployment, and OpenAI usage for real-world healthcare problems.

Project Links

App: https://healthaiproject-9zncftohtgbtxnwcvrkdss.streamlit.app/
GitHub: https://github.com/mahendra4338/HealthAI_Project/tree/main
Report Source: IBM Granite Model Documentation