SMARTBRIDGE

🟦 Generative AI Project using IBM Cloud – HEALTHAI

🔷 Project Documentation Format

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1. Introduction

- Project Title: HEALTHAI: Intelligent Healthcare Assistant using IBM Granite (Generative AI with IBM Cloud)
- Team Members:
  - Likitha Putta Reddy (Team Leader – Development & Integration):
    Led the complete development of the HEALTHAI application, including IBM Granite integration, Streamlit-based UI design, module creation, and model API handling.
  - Velakaturi Lekhya Sreeya (Model Interaction & Testing):
    Contributed by assisting in prompt design, testing the AI model outputs across modules like Disease Prediction and Health Chat, and refining interactions with IBM Granite.
  - Sama Pavithra (UI Structuring & Feature Enhancement):
    Supported in designing user flow, organizing the Streamlit interface across all modules, and suggesting improvements in user interaction and feature behavior.

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2. 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

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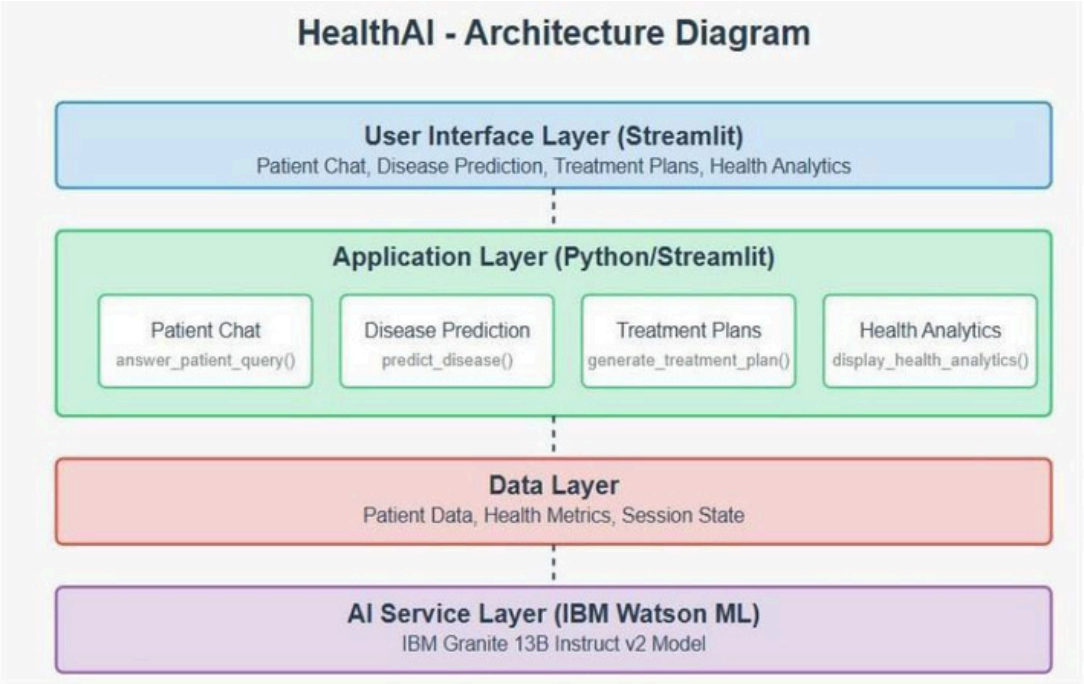
3. Architecture

- 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 3.3B Instruct model from Hugging Face: ibm-granite/granite-3.3-2b-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.



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4. Setup Instructions

Prerequisites

- Python 3.10+
- pip
- Hugging Face account and token
- Installed model files if using local (granite/ folder)

Installation

git clone https://github.com/Likitha456/Health-ai.git

cd Health-ai

pip install -r requirements.txt

Environment Variables

Create a .env file in the root folder:

HUGGINGFACEHUB_API_TOKEN=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

✅ .env file must be excluded in .gitignore.

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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
```

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6. Running the Application

For Hugging Face 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"

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7. API Documentation

Endpoint:
https://api-inference.huggingface.co/models/ibm-granite/granite-3.3-2b-instruct
Method: POST

Headers:

{

"Authorization": "Bearer <HUGGINGFACEHUB_API_TOKEN>",

"Content-Type": "application/json"

}

Example Request:

{

"inputs": "What are the symptoms of diabetes?"

}

Example Response:

{

"generated_text": "Common symptoms of diabetes include frequent urination..."

}

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8. Authentication

- Hugging Face token is securely stored in .env
- .env is excluded via .gitignore
- App is currently public and stateless (no user login)
- Streamlit or Firebase Auth can be added in future

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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

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10. Testing

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

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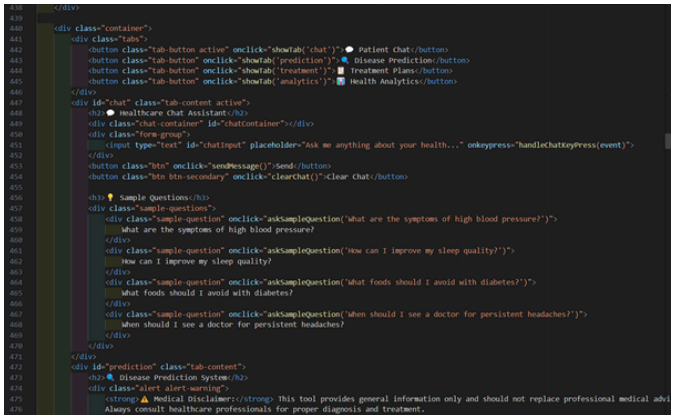
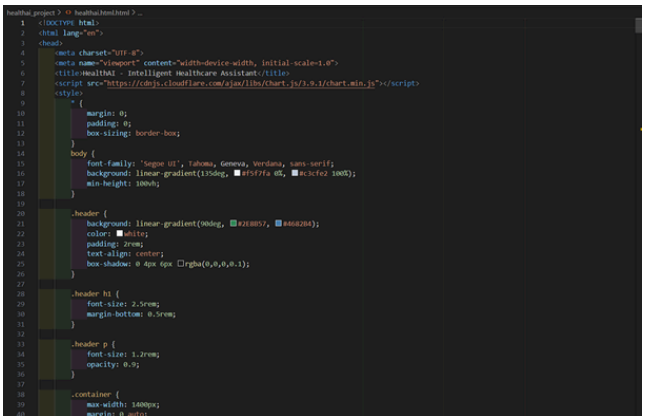
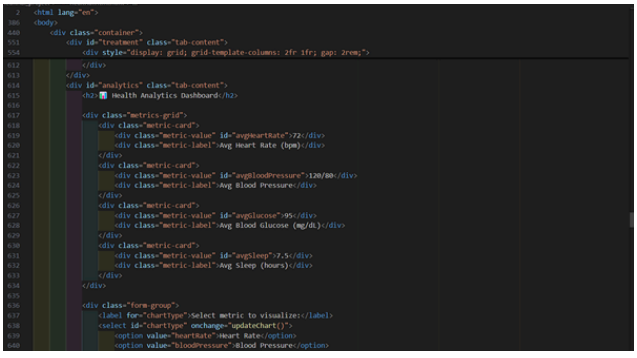
11. Screenshots or Demo

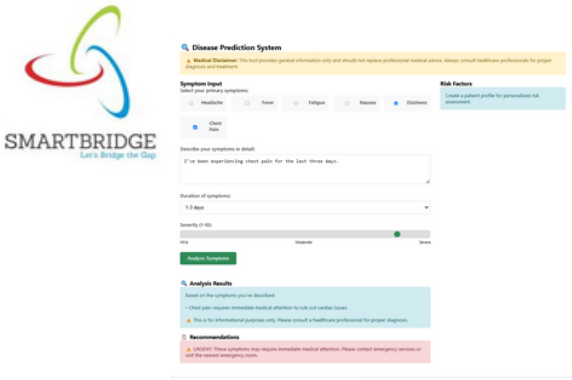
- 📹 Demo Video on YouTube
- INPUTS (CODES) :

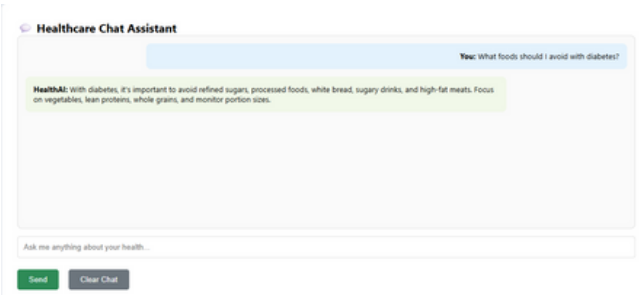


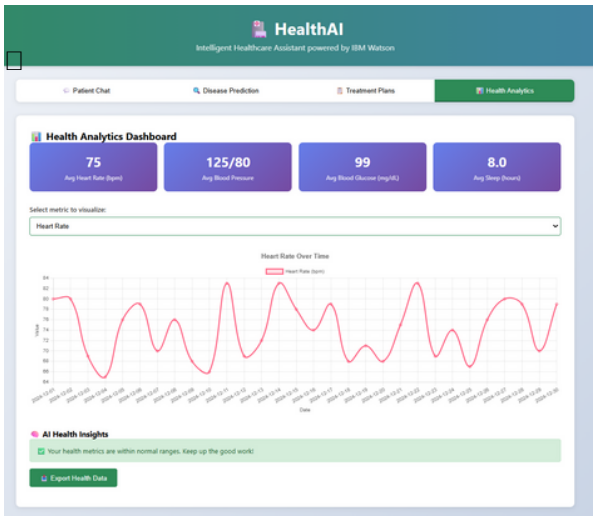


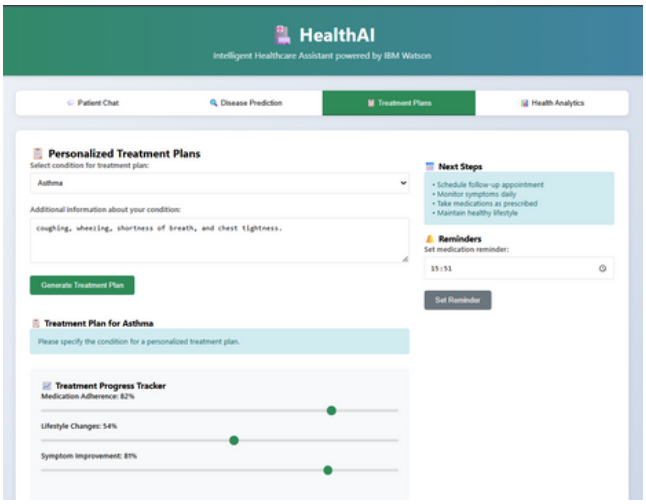


- OUTPUT :









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12. Known Issues

- 🦠 Generic model outputs due to lack of medical domain fine-tuning
- 🦠 Internet dependency when using Hugging Face API
- 🦠 No data persistence (currently stateless app)

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13. Future Enhancements

- ✅ Add user authentication and patient record storage
- ✅ Deploy on IBM Cloud / Hugging Face Spaces
- ✅ Multilingual prompt support
- ✅ Mobile version of the app
- ✅ Integrate with real-time health APIs or EHRs
