

# HealthAI – Project Documentation

## 1. Introduction

Project Title : HealthAI

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## 2. Project Overview

Purpose:

HealthAI is designed to provide smart, easy-to-understand healthcare assistance using Granite models from Hugging Face. It enables patients to interact through natural conversations, receive predictions about possible diseases, and get recommended treatment plans. By leveraging AI and Gradio-powered interfaces on Google Colab, HealthAI ensures fast, accessible, and secure medical guidance for both patients and healthcare providers.

Features:

- Patient Chat (Natural language healthcare support)
- Disease Prediction (Early detection support)
- Treatment Plan Suggestions (Actionable medical recommendations)
- Secure & Accessible Deployment (Google Colab support)

## 3. Architecture

- Frontend (Gradio): Interactive and user-friendly web UI.
- Backend (Google Colab + FastAPI optional): Hosts model execution and integrates Granite models.
- AI Model (IBM Granite – Hugging Face): Natural language understanding, disease prediction, and response generation.

## 4. Setup Instructions

Prerequisites:

- Python 3.9+
- Gradio Framework
- IBM Granite Models (Hugging Face)
- Google Colab account with T4 GPU
- GitHub for version control

Installation:

1. Clone the repository
2. Install dependencies
3. Open in Google Colab
4. Configure Hugging Face credentials
5. Run Gradio app

## 5. Folder Structure

app/ → Core backend logic  
ui/ → Gradio interface  
models/ → Pre-trained models  
notebooks/ → Google Colab notebooks  
requirements.txt → Dependencies  
main.py → Entry script

## 6. Authentication (Optional Enhancements)

- Token/API authentication
- User roles: Patient, Doctor, Researcher

## 7. User Interface

- Chat interface
- Symptom input
- Disease prediction output
- Treatment suggestions
- Future: PDF health report

## 8. Testing

- Unit testing
- API testing (Postman/Swagger)
- Manual testing
- Edge case handling

## 9. Screenshots

Figure 1 – Disease Prediction Interface

The screenshot below shows the **"Disease Prediction"** tab of HealthAI. User input: fever, head pain, cold.

Output: Conditions with explanations and treatment suggestions.

## 10. Known Issues

- Limited accuracy for rare diseases
- Dependency on Colab GPU
- Not a replacement for professional medical advice

## 11. Future Enhancements

- Integration with medical databases
- Multilingual support
- Mobile app deployment
- Advanced visualization of reports

## 12. Project Output

HealthAI provides:

- Symptom input field
- Real-time disease predictions
- Treatment suggestions
- Clear separation of prediction & treatment sections

This confirms HealthAI meets its objective of early detection and educational guidance.

### Screenshot of HealthAI Interface:

