

Project Documentation

1. Introduction

Project Title: Medical AI Assistant
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2. Project Overview

Purpose:

The purpose of the Medical AI Assistant is to provide users with quick, AI-powered guidance related to health symptoms and medical conditions.

It improves healthcare awareness and accessibility while emphasizing the importance of professional consultation.

Features:

- Disease Prediction: Analyze symptoms and provide possible conditions with recommendations.
- Treatment Plan Generation: Personalized suggestions based on condition, age, gender, and medical history.
- User-Friendly Interface: Built with Gradio for easy interaction.
- AI-Powered Analysis: Uses IBM Granite LLM for natural language processing.

3. Architecture

Frontend (Gradio): Interactive web interface with tabs for disease prediction and treatment planning.

Backend (Python & Hugging Face): Handles model loading, prompts, and responses.

LLM Integration (IBM Granite): Uses ibm-granite/granite-3.2-2b-instruct for medical text generation.

4. Setup Instructions

Prerequisites:

- Python 3.9 or later
- pip and virtual environment tools
- Internet access for model downloads

Installation:

1. Clone the repository
2. Install dependencies from requirements.txt
3. Run: `python healthai.py`
4. Open the Gradio link in your browser

5. Folder Structure

project/

■■■ healthai.py # Main application script

■■■ requirements.txt # Dependencies

■■■ README.md # Documentation

6. Running the Application

1. Run `python healthai.py`
2. Open the Gradio link in browser
3. Navigate tabs:
 - Disease Prediction: Enter symptoms → Analyze
 - Treatment Plan: Enter details → Generate

7. API Documentation

Currently not applicable. Future versions may include REST APIs.

8. Authentication

Current version runs without authentication.

Future deployment may include:

- API key authentication
- Role-based access

9. User Interface

- Clean two-tab layout (Disease Prediction & Treatment Plans)
- Textbox input and detailed text output
- Disclaimer for medical safety

10. Testing

- Unit Testing: Prompt and response functions
- Manual Testing: Symptom entry and treatment plan generation
- Edge Cases: Empty or unusual inputs

11. Screenshots

Screenshots of the Gradio interface can be added here.

12. Known Issues

- Responses may vary with inputs
- No guaranteed medical accuracy
- Long symptom entries may be truncated

13. Future Enhancements

- Add API support for mobile apps
- Enable voice input/output
- Improve predictions with medical datasets
- Add data visualization features