

Health AI – Intelligent Healthcare Assistant

Project Documentation

Introduction

Project Title: Health AI – Intelligent Healthcare Assistant

Team Members:

- MAHENOOR S
- KARTHIKA R
- PARIMATHA K
- ANISH FATHIMA R

Project Overview

Purpose

Health AI is designed to deliver intelligent, accessible, and personalized healthcare support using IBM Granite models via Hugging Face. Deployed on Google Colab, it offers AI-powered features like Disease Prediction, Treatment Planning, Patient Chat, and Health Analytics. The assistant simplifies medical guidance and enhances healthcare accessibility.

Features

Disease Prediction

- **Key Point:** AI-driven symptom analysis
- **Functionality:** Users input symptoms in natural language. The Granite model evaluates and returns possible medical conditions with general medication suggestions. This helps users understand potential health issues and encourages timely medical consultation.

Treatment Plans

- **Key Point:** Personalized medical recommendations
- **Functionality:** Based on user inputs (condition, age, gender, medical history), the assistant generates tailored treatment suggestions including home remedies and general medication guidelines.

Patient Chat

- **Key Point:** Conversational health support
- **Functionality:** Users can ask health-related questions and receive informative responses. The assistant acts as a first-level guide for common health concerns.

Health Analytics

- **Key Point:** Visual health insights
- **Functionality:** Tracks and visualizes patient health metrics over time, helping users monitor progress and stay informed.

Architecture

- **Frontend (Gradio):** Multi-tab interface for Disease Prediction, Treatment Plans, and Patient Chat. Handles text inputs, dropdowns, and displays AI-generated outputs.
- **Backend (IBM Granite via Hugging Face Transformers):** Processes user inputs and generates responses using large language models.
- **Runtime (Google Colab):** Ensures dynamic installation of required libraries (transformers, torch, gradio) for reproducible execution.

Setup Instructions

Prerequisites

- Google Colab account
- Python 3.9+ runtime
- Libraries: transformers, torch, gradio

Installation Process (Colab)

```
python
!pip install transformers torch gradio -q
```

Running the Application

1. Open the HealthAI.ipynb notebook in Google Colab
2. Install dependencies
3. Run all code cells
4. Launch Gradio interface (`app.launch(share=True)`)
5. Interact via browser tabs

Folder/Notebook Structure

- **HealthAI.ipynb** – Main Colab notebook
- **Helper Functions:**
 - `generate_response()` – LLM response handler
- **Scenario Functions:**
 - `disease_prediction()` – Analyzes symptoms
 - `treatment_plan()` – Generates treatment suggestions
- **Gradio Interface Tabs:**
 - Disease Prediction
 - Treatment Plans
 - Patient Chat

API/Model Documentation

- **Model Used:** ibm-granite/granite-3.2-2b-instruct
- **Key Functions:**
 - Disease Prediction
 - Treatment Planning
 - Patient Chat

Authentication

- Current version runs in open demo mode on Colab
- Future Enhancements:
 - IBM Watsonx API key integration
 - JWT-based session security
 - Role-based user management (patient, doctor, analyst)

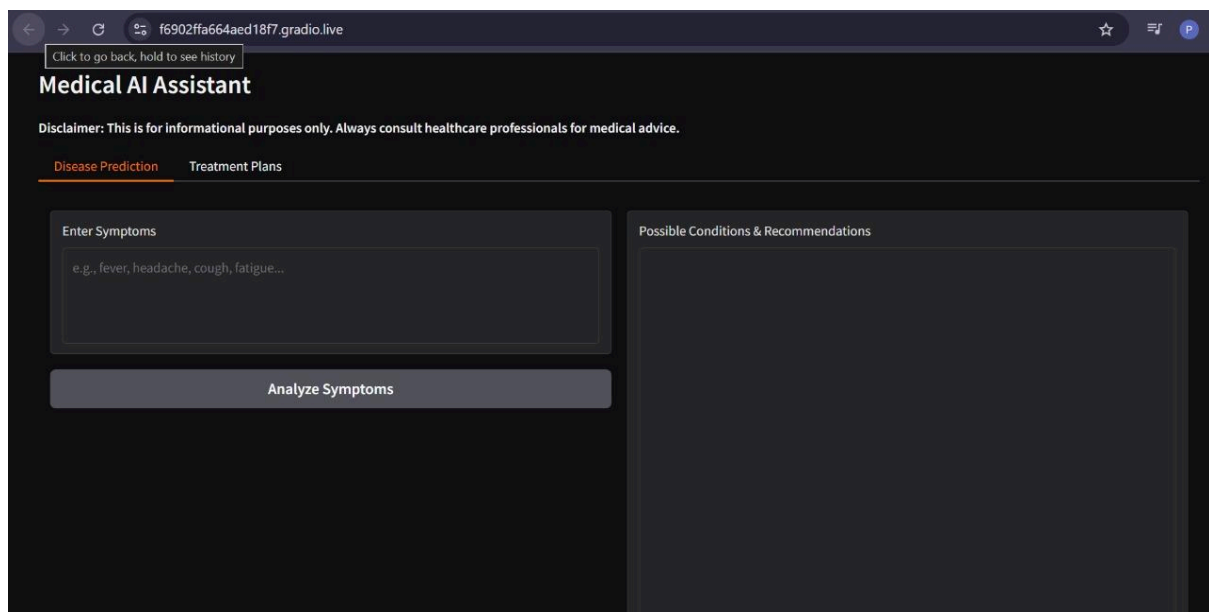
User Interface

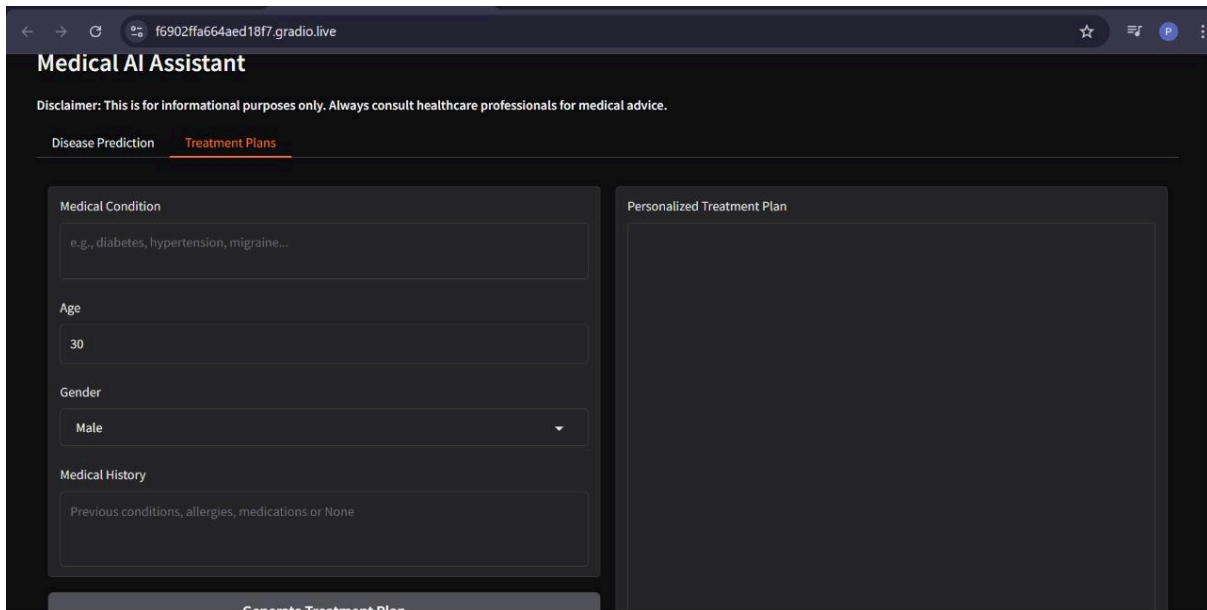
- Sidebar Tabs: Disease Prediction, Treatment Plans, Patient Chat
- Text Inputs: Symptoms, condition, age, gender, medical history
- Outputs: AI-generated medical insights and recommendations

Testing

- Unit Testing: Prompt handling, model output validation
- Manual Testing: Symptom input, treatment generation
- Edge Cases: Ambiguous symptoms, incomplete medical history

Screen shots





Known Issues

- Output formatting may vary
- Accuracy depends on clarity of input
- Requires internet connection for model access

Future Enhancements

- Export to Word/PDF for medical reports
- Multi-language support
- Integration with EHR systems
- Advanced analytics and visualization