HealthAI: Intelligent Healthcare Assistant Using IBM Granite

1. **Introduction**

* Project title : HealthAI: Intelligent Healthcare Assistant Using IBM Granite
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1. **Project overview**

**Purpose:**

The main purpose of HealthAI: Intelligent Healthcare Assistant Using IBM Granite is to provide an intelligent, accessible, and reliable digital healthcare solution that assists both patients and healthcare professionals.

* **For Patients:**

To offer a virtual healthcare assistant that can answer health-related queries.

To provide a symptom checker for preliminary health guidance.

To improve accessibility to healthcare resources anytime, anywhere.

* **For Doctors/Healthcare Providers:**

To reduce the burden of answering repetitive queries.

To assist in medical record analysis and decision-making.

To support telemedicine platforms for better patient interaction.

* **For the Healthcare System:**

To use AI-powered insights for faster and more efficient healthcare services.

To enhance patient education and awareness about health conditions.

To promote preventive care and reduce unnecessary hospital visits.

1. **Features:**

* Future Enhancements Integration with wearable devices (smartwatches, fitness trackers).
* Voice assistant support for hands-free healthcare queries.
* Multilingual support for regional languages.
* AI-driven appointment scheduling with doctors.
* Predictive analytics for early disease detection.

1. **System Architecture:**

* + - ***User Layer*:** Patients and doctors interact through the web/mobile interface.
    - ***Application Layer:*** Backend (Flask/Django/Node.js) manages requests, processes data, and communicates with IBM Granite.
    - ***AI Layer:*** IBM Granite handles natural language understanding and generates meaningful responses.
    - ***Database Layer:*** Stores patient details, medical history, and chat records.
    - ***Cloud Layer:*** IBM Cloud ensures scalability, availability, and security.

**FRONTEND:**

## **Main Application Layout:**

## Configure page title, icon, and layout preferences

## Implement a sidebar for patient profiles and feature selection

## Create custom CSS for enhanced visual appearance

## **Feature Specific Interfaces:**

## **Patient Chat:** Chat-style interface with message history

## 2. **Disease Prediction:** Symptom input form and prediction display

## 3. **Treatment Plans:** Condition input and treatment plan output

**BACKEND:**

i. Handles user authentication and session management.

ii. Connects with IBM Granite for AI-based response generation.

iii. Provides RESTful APIs for communication between frontend and AI model.

1. **Setup Instruction**

**Prerequisites**

**System Requirements**

* + Python 3.9+
  + pip (Python package manager)
  + Longchain
  + At least 8GB RAM (GPU recommended for faster inference)

**Accounts/Access**

* Hugging Face account (to access ibm-granite models)
* IBM Cloud account (optional if using Granite APIs)
* Gitup

**Tools Installed**:

* + Git, Docker (optional for deployment), Postman (for API testing)

1. **Running the application**

**Running on Google Colab / Cloud**

* **Google Colab**: Upload your script and run cells. A public Gradio link will appear automatically.
* **IBM Cloud / Hugging Face Spaces**: Once deployed, simply visit the hosted URL to access the application globally.

1. API Documentation

* Base URL
* Endpoint
* Treatment Plan API

## **Authentication**

Currently, no authentication is required (for demo purpose).

In production, you can integrate:

* **API Key Authentication**
* **JWT Token-based Authentication**
* **OAuth 2.0** for secure access.

# **User Interface (UI) Design – HealthAI**

The **HealthAI interface** is built using **Gradio**, providing a clean, simple, and user-friendly layout.  
It has a **tab-based design** with two main modules:

1. **Disease Prediction**
2. **Treatment Plans**

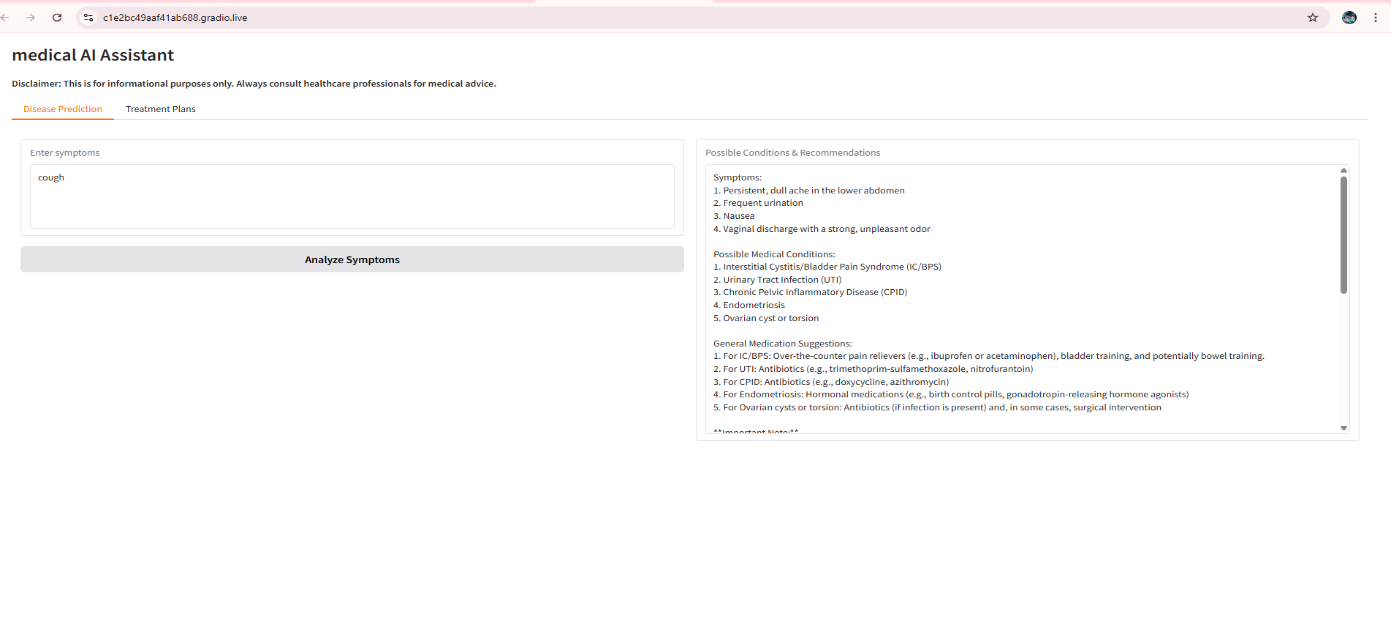
A disclaimer is displayed at the top to remind users that the system is **for informational purposes only**.

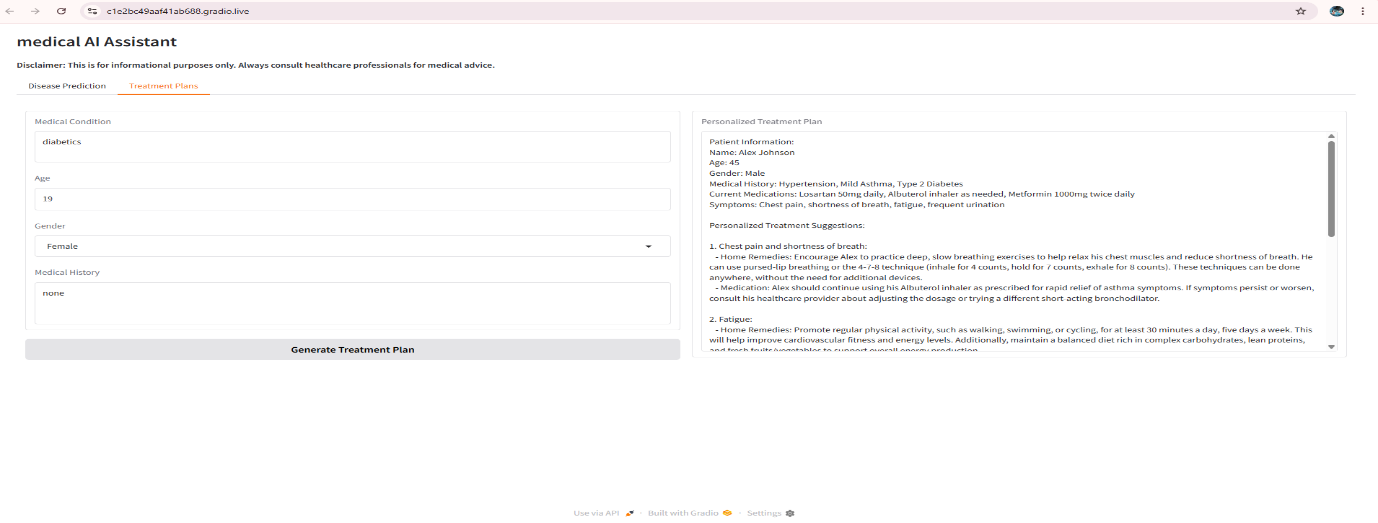
## **Features**

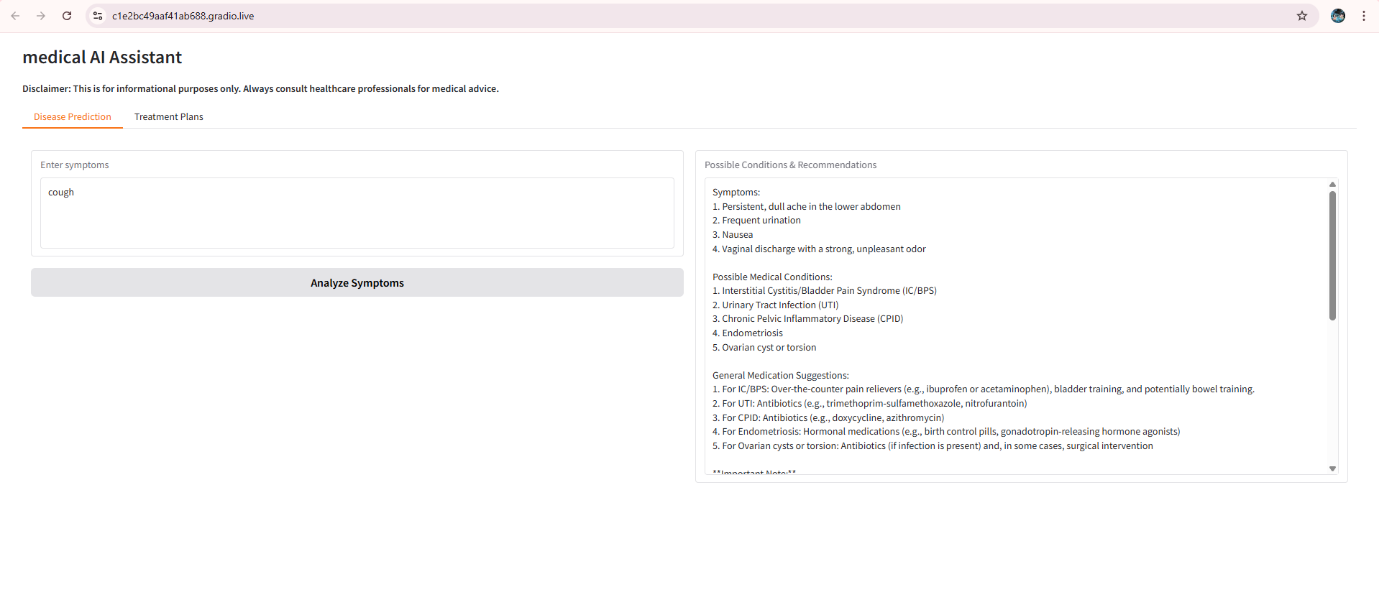
* **Symptom Checker** – Suggests possible conditions based on input.
* **Healthcare Chatbot** – Provides instant answers to health queries.
* **Medical Records Management** – Organizes and analyzes patient history.
* **Telemedicine Support** – Connects patients with doctors.
* **Preventive Health Tips** – Provides wellness suggestions.

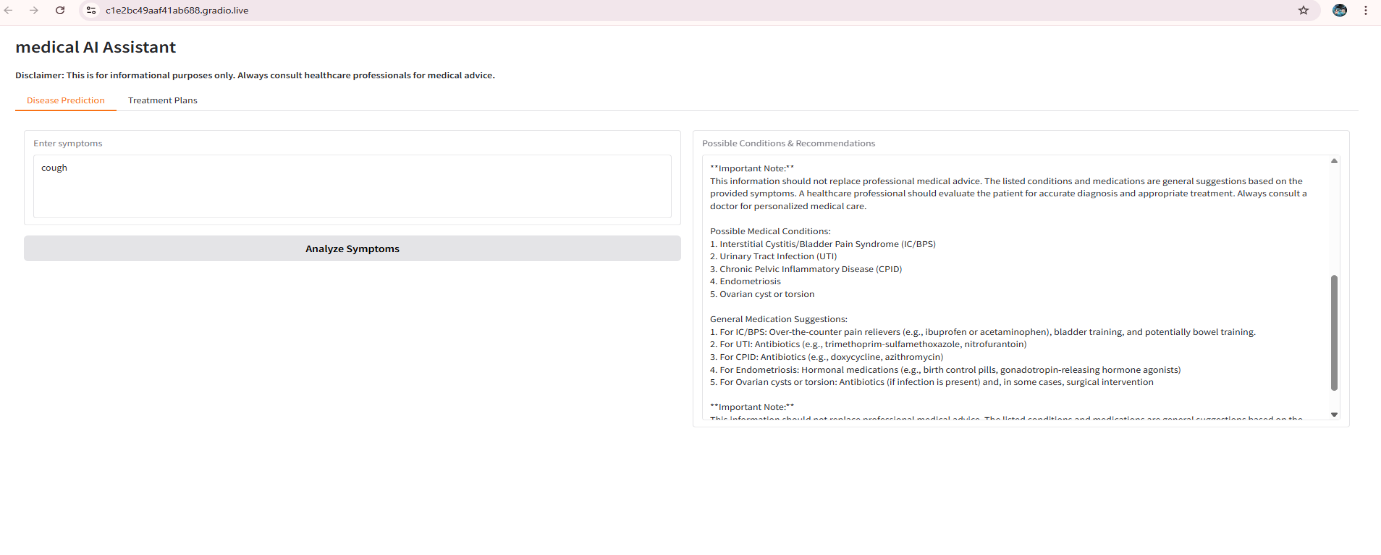
1. **Conclution**

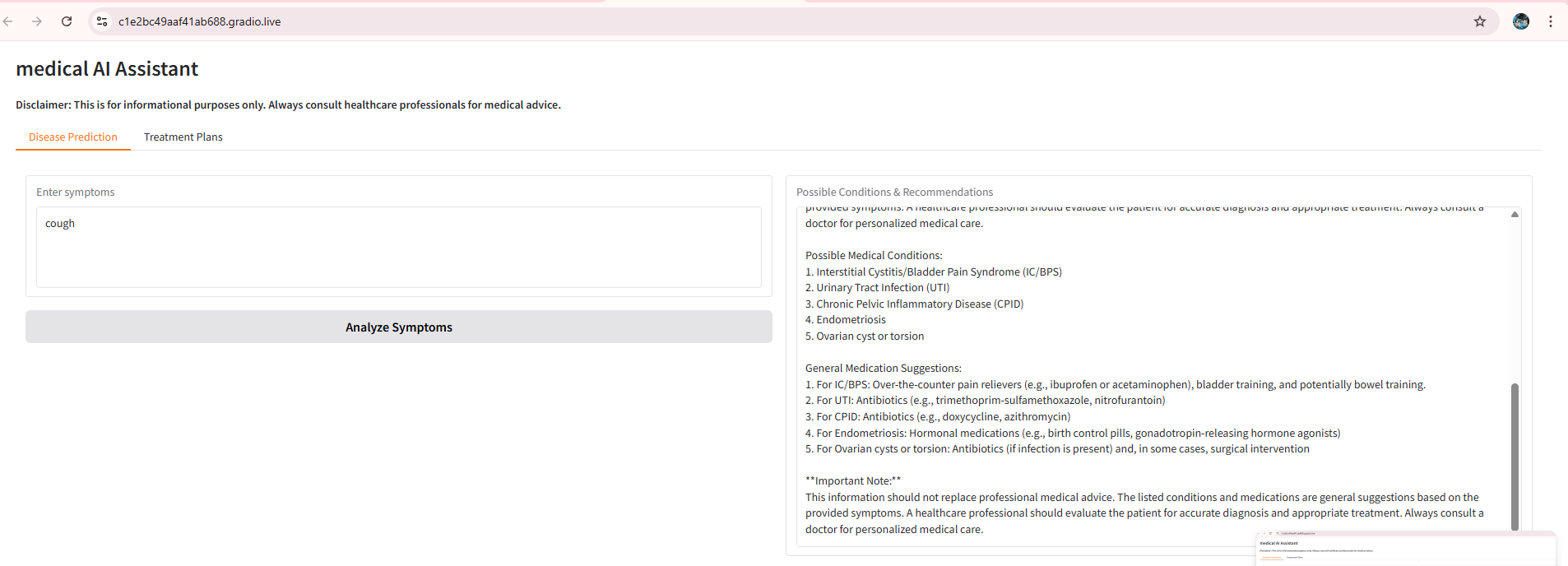
HealthAI demonstrates how **IBM Granite** can transform healthcare services by acting as an intelligent assistant. It offers real-time health query support, symptom analysis, and medical education while reducing the burden on healthcare providers. By integrating AI with a user-friendly frontend and a scalable backend, HealthAI ensures accessibility, security, and efficiency. This project highlights the potential of AI-driven healthcare assistants in revolutionizing digital health solutions.

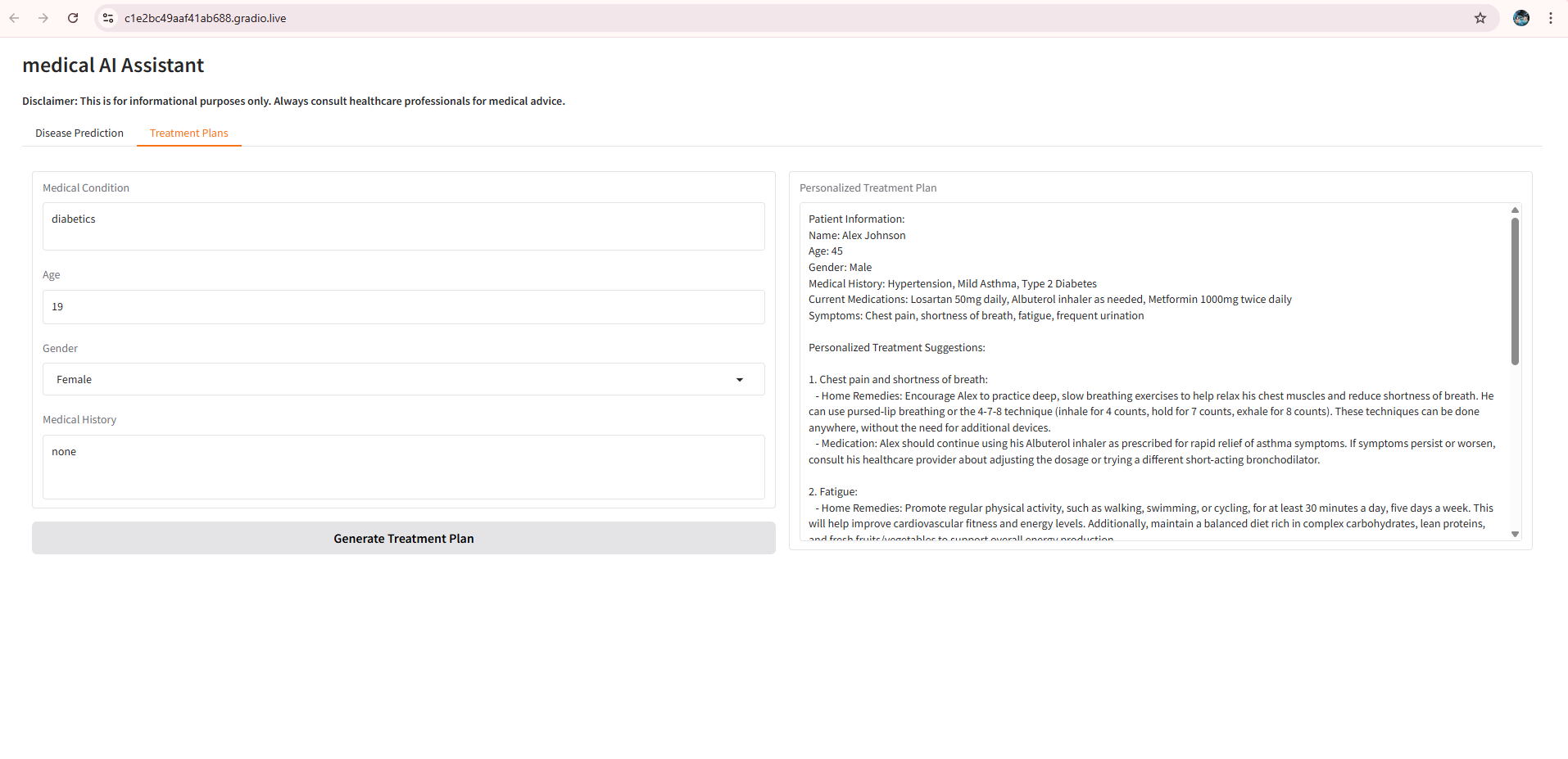


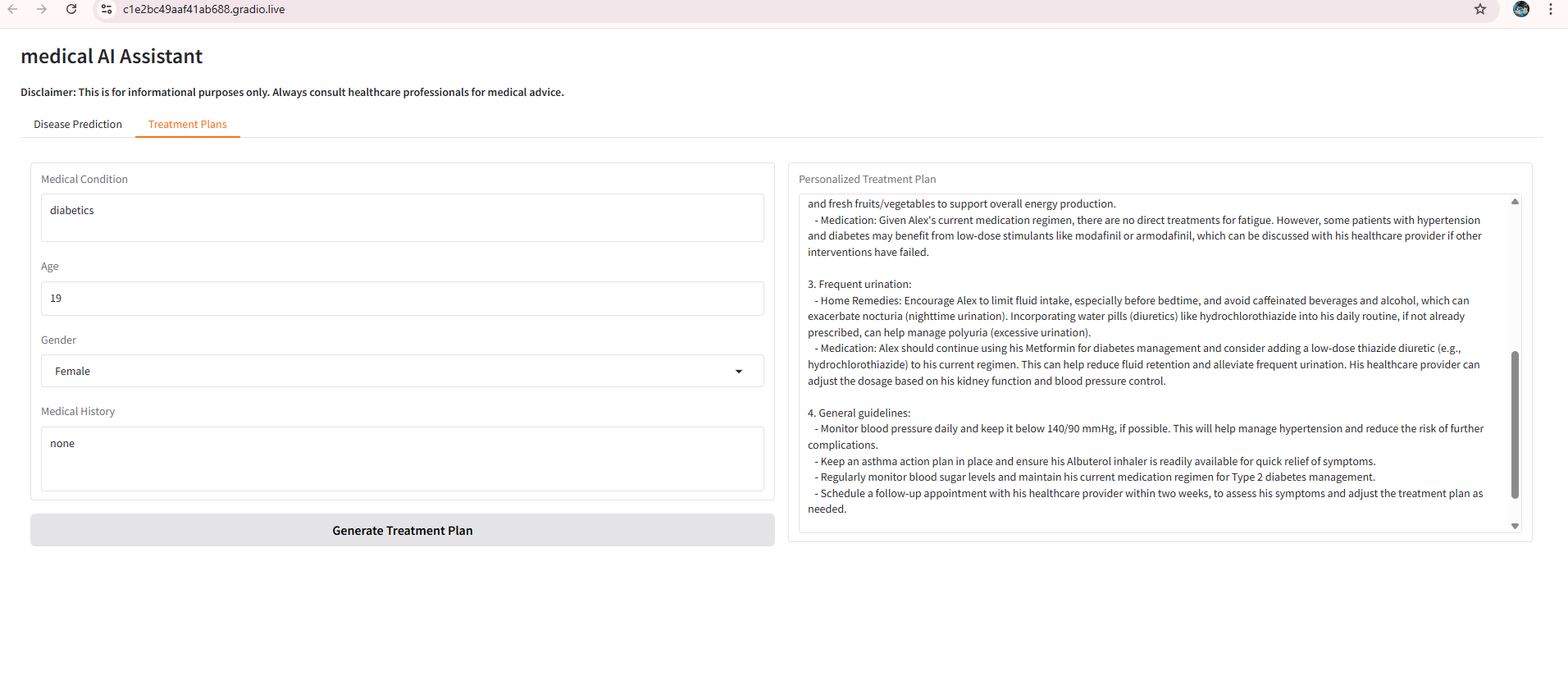


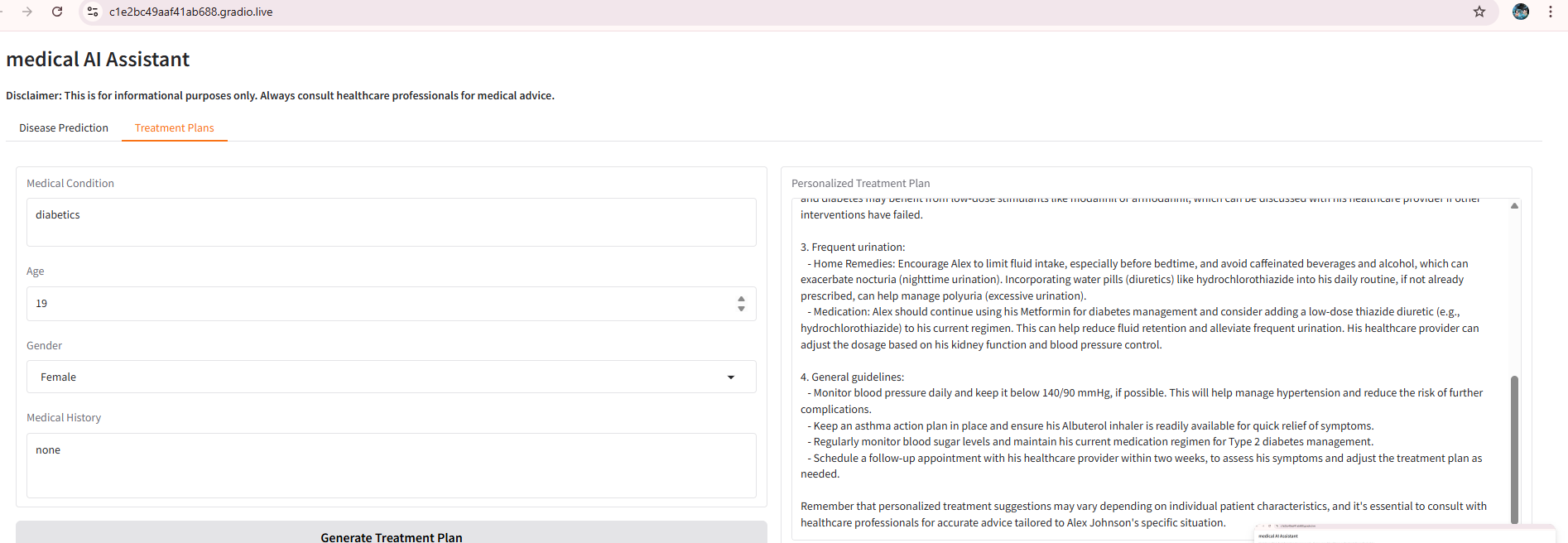


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