📄 Project Documentation

1. Introduction

- **Project Title** : Health AI – Intelligent Healthcare Assistant
- **Team Leader** : S. Deepak Kumar
- **Team Member** : Deepak J
- **Team Member** : Elumalai A
- **Team Member** : Saranraj A

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2. Project Overview

Purpose:
The purpose of Health AI is to provide an **intelligent healthcare assistant** that empowers patients and doctors with AI-powered support. By leveraging Artificial Intelligence and Natural Language Processing, Health AI helps with **symptom checking, report summarization, medication reminders, and appointment scheduling**. It is designed not to replace doctors, but to **assist them** by reducing administrative workload, saving time, and improving healthcare access—especially in rural or underserved areas.

Features:

- **Symptom Checker**
  - *Key Point:* Quick health guidance
  - *Functionality:* Provides an initial assessment based on user input and suggests next steps.
- **Report Summarization**
  - *Key Point:* Simplified medical records
  - *Functionality:* Converts lengthy medical reports into short, useful insights for patients and doctors.

- **Medication Reminders**
    - *Key Point:* Better adherence to treatment
    - *Functionality:* Sends timely notifications to ensure patients take medicines on time.
- **Appointment Scheduling**
    - *Key Point:* Easy healthcare access
    - *Functionality:* Allows patients to book appointments quickly and efficiently.
- **AI Chatbot**
    - *Key Point:* 24/7 support
    - *Functionality:* Answers general health-related questions instantly.

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3. Architecture

Frontend (Web/App Interface):
The frontend provides a **simple and user-friendly interface** where patients can chat, set reminders, and book appointments. It is built using **HTML, CSS, and JavaScript** (for web) or can be extended to **mobile applications**.

Backend (Flask/Django):
The backend is developed in **Python** using Flask/Django frameworks. It handles:

- Processing user queries
- Generating AI-based responses
- Managing reminders and appointments

AI/NLP Engine:

- Uses **Natural Language Processing** (NLTK/spaCy/TensorFlow) to analyze patient queries.
- Provides meaningful and accurate answers to health-related questions.

Database (MySQL/MongoDB):

- Stores patient details, reminders, and appointment data.
- Ensures security and confidentiality of medical information.

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4. Setup Instructions

Prerequisites:

- Python 3.9 or later
- Flask/Django installed
- MySQL/MongoDB database setup
- NLP libraries: NLTK, spaCy, TensorFlow

Installation Process:

1. Install Python and dependencies using requirements.txt.
2. Configure the database connection.
3. Start the backend server with Flask/Django.
4. Launch the frontend (web browser or mobile app).
5. Interact with the assistant for queries, reminders, and scheduling.

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5. Folder Structure

- **app/** – Contains backend logic and modules.
- **app/api/** – Subdirectory for API routes like chatbot, reminders, and appointments.
- **ui/** – Frontend interface files.
- **chatbot_engine.py** – Handles AI/NLP responses.
- **reminder_module.py** – Manages medicine reminders.
- **appointment_module.py** – Handles booking and scheduling.
- **report_summarizer.py** – Summarizes uploaded medical reports.

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6. Running the Application

1. Launch the backend server.
2. Open the frontend web interface.
3. Log in as a patient or doctor.
4. Use chatbot for queries, set medicine reminders, and book appointments.
5. View summarized reports and receive notifications.

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7. API Documentation

- **POST /chat/query** → Accepts a patient's question and responds with an AI-generated answer.
- **POST /reminder/set** → Sets a medication reminder.
- **POST /appointment/book** → Books an appointment with available doctors.
- **POST /report/upload** → Uploads a medical report for summarization.

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8. Authentication

For secure access:

- **Token-based authentication (JWT)** for patient sessions.
- **Role-based access** (Patient, Doctor, Admin).
- Encrypted storage for medical data.

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9. User Interface

- **Dashboard** → Overview of health data and reminders.
- **Chat Interface** → Conversational AI assistant.
- **Reminder Section** → Medicine and appointment notifications.
- **Report Upload & Summary** → Easy access to medical insights.

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10. Testing

- **Unit Testing** → Tested chatbot responses and reminder scheduling.
- **API Testing** → Verified endpoints with Postman.
- **Manual Testing** → Simulated user queries and doctor workflows.
- **Edge Case Handling** → Tested invalid queries, missing data, and incorrect inputs.

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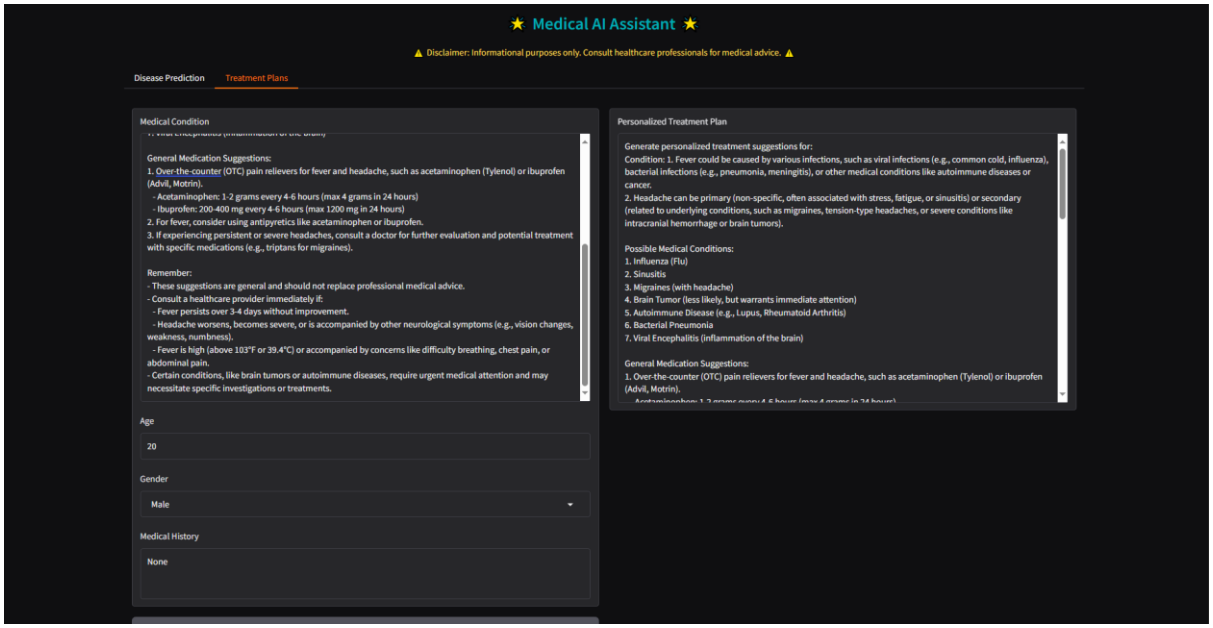
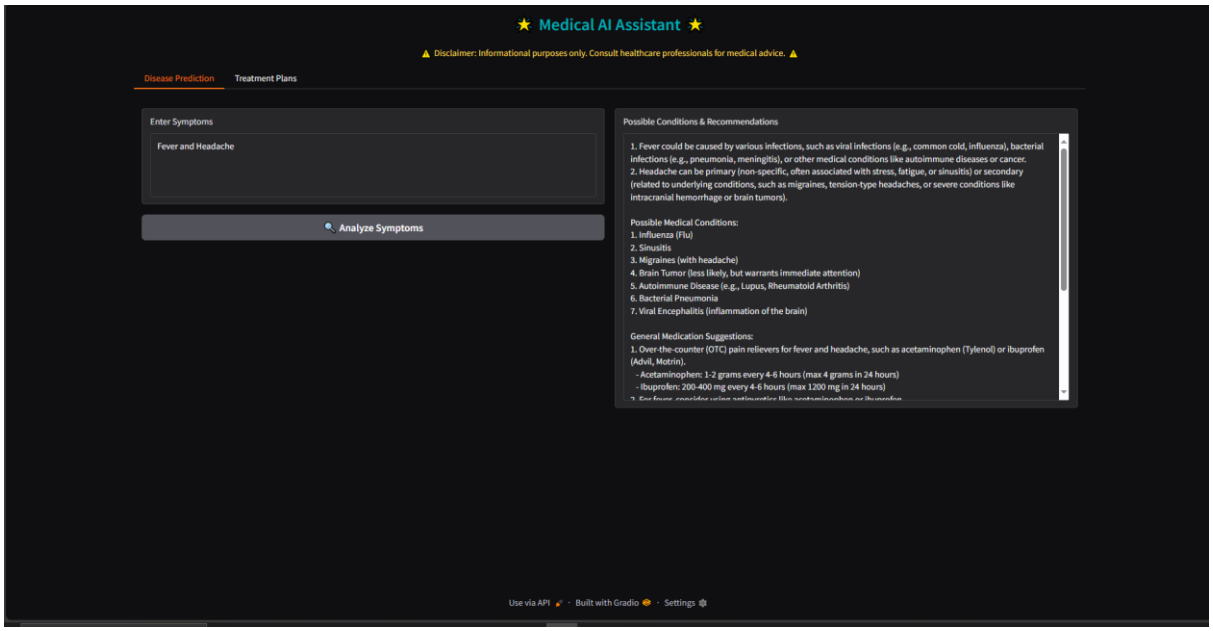
11. Screenshots

OutPut:





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12. Known Issues ⚠

- Chatbot responses may sometimes be **too general** and not fully accurate.
- System currently supports only **English language queries**.
- Reminder notifications work only when the app/browser is active.
- Limited to **basic symptom checking** (not advanced diagnosis).

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13. Future Enhancements 🚀

- **Voice-based assistant** to allow users to speak queries.

- **Multi-language support** for wider accessibility.
- **Integration with wearable devices** (smartwatch, fitness bands).
- **Predictive diagnosis** using patient history and AI models.
- **Telemedicine support** for video consultations.