HealthAI – Intelligent Healthcare Assistant

1.Introduction

• Project Title: Medical AI Assistant

• Team Members: A.Sivasangari, S.Sujithra, D.Swetha, D.Nancy

2.Project Overview

Purpose:

The Medical AI Assistant provides users with safe and intelligent healthcare insights through:

- Disease Prediction
- Treatment Plan Generation

It leverages **Hugging Face Transformers**, **PyTorch**, and **Gradio** inside **Google Colab** for accessible healthcare support.

Future Scope:

- Expand to include a patient chatbot.
- Add an analytics dashboard for health metrics.
- Multi-language support for regional users.

3.Architecture

Frontend (Gradio UI):

• Interactive tabs for disease prediction and treatment plan generation.

Backend (Python in Google Colab):

- Hugging Face ibm-granite/granite-3.2-2b-instruct model.
- PyTorch for inference.

Model Integration:

• Default Model: ibm-granite/granite-3.2-2b-instruct

• Guardrails: Ensures disclaimers and prevents unsafe responses.

4.Setup Instructions

Prerequisites:

- Python 3.9+
- Google Colab account
- Hugging Face access

Installation in Colab

!pip install transformers torch gradio -q

Run the Application

```
app.launch(share=True)
```

5. Folder / Notebook Structure

6.Running the Application

- Open Google Colab.
- Upload and run medical_ai.ipynb.
- Install dependencies.

- Launch Gradio interface.
- Use tabs for prediction and treatment.

7.API Documentation

POST /prediction/analyze

- Input: Symptoms text.
- Output: Possible conditions + recommendations.

POST /treatment/plan

- Input: Condition, Age, Gender, Medical History.
- Output: Personalized treatment suggestions (with disclaimer).

8.User Interface

- Tab 1: Disease Prediction
- Tab 2: Treatment Plan

Each output includes a disclaimer:

"This is for informational purposes only. Always consult healthcare professionals."

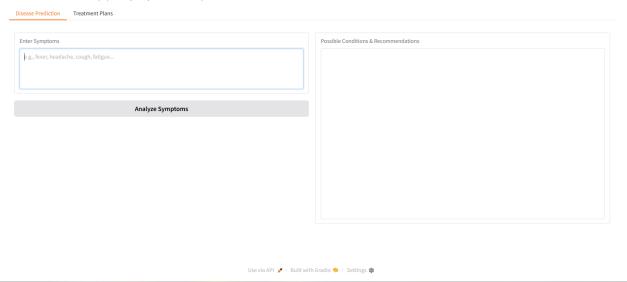
9.Testing

- Unit Testing: Prompt formatting, response validation.
- Manual Testing: Disease prediction and treatment plan accuracy.
- Edge Cases: Empty inputs, irrelevant text.

10. Screenshots

Medical AI Assistant

 $\label{thm:disclaimer:This is for informational purposes only. Always consult healthcare professionals for medical advice.$



11.0utput

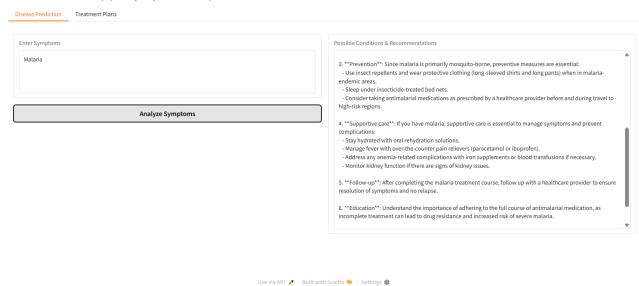
Medical AI Assistant

Disclaimer: This is for informational purposes only. Always consult healthcare professionals for medical advice.

Disease Prediction Treatment Plans	
Disease Prediction Treatment Plans Enter Symptoms Malaria Analyze Symptoms	Possible Conditions & Recommendations Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes. It can lead to serious complications if left untreated, including anemia, organ failure, and death. Prompt, appropriate treatment is crucial for effective management and recovery. 1. "'Diagnosis": if you suspect malaria, consult a healthcare professional immediately. They will perform blood tests (microscopy or rapid diagnostic tests) to confirm the presence of the Plasmodium parasites. 2. "Medications": The most common treatment for malaria is artemisinin-based combination therapies (ACTs). These are considered the most effective drugs against Plasmodium falciparum, the deadliest species of malaria parasite. The choice of ACT may vary depending on factors such as age, pregnancy status, and local resistance patterns. - "artemether + lumefantrine": This is a popular choice for adults and pregnant women. It requires once-daily dosing for five days. - "malarone (atovaquone + proguanil)": This is another effective option, especially for travelers. It is taken twice daily for five days. - "dihydroartemisinin-piperaquine": This is an alternative for those who cannot take quinine, a drug often included in older malaria treatments. It's also taken once daily for five days. 3. "Prevention": Since malaria is primarily mosquito-borne, preventive measures are essential:

Medical AI Assistant

Disclaimer: This is for informational purposes only. Always consult healthcare professionals for medical advice.



Medical AI Assistant

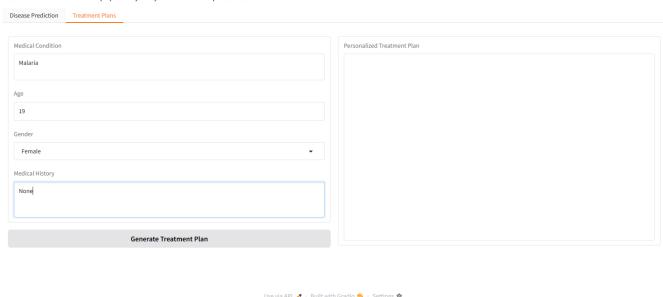
Disclaimer: This is for informational purposes only. Always consult healthcare professionals for medical advice.

Disease Prediction Treatment Plans	
Enter Symptoms Malaria	Possible Conditions & Recommendations enuerinc areas. - Sleep under insecticide-treated bed nets. - Consider taking antimalarial medications as prescribed by a healthcare provider before and during travel to high-risk regions.
Analyze Symptoms	4. **Supportive care**: If you have malaria, supportive care is essential to manage symptoms and prevent complications: - Stay hydrated with oral rehydration solutions. - Manage fever with over-the-counter pain relievers (paracetamol or ibuprofen). - Address any anemia-related complications with iron supplements or blood transfusions if necessary. - Monitor kidney function if there are signs of kidney issues.
	5. "Follow-up": After completing the malaria treatment course, follow up with a healthcare provider to ensure resolution of symptoms and no relapse. 6. "Education": Understand the importance of adhering to the full course of antimalarial medication, as incomplete treatment can lead to drug resistance and increased risk of severe malaria.
	Remember: These recommendations are general and may vary based on individual health factors, local malaria transmission patterns, and the specific prescribed medication. Always consult with a healthcare professional for personalized advice and treatment.

12.Treatment Plan

Medical AI Assistant

Disclaimer: This is for informational purposes only. Always consult healthcare professionals for medical advice.



13.Output

Medical AI Assistant

Disclaimer: This is for informational purposes only. Always consult healthcare professionals for medical advice. Medical Condition Strong evidence supporting gartic as a primary treatment for majaria. Ose gartic supplements cautiously at home, but do not replace prescribed medication.

- **Ginger: ** Ginger can help alleviate nausea, which is common with antimalarial drugs. You can consume Malaria ginger-infused tea or fresh ginger pieces. Be cautious with high doses, as they might interfere with blood thinning medications. -**Increase Water Intake:** Stay hydrated by drinking plenty of fluids, especially if you have fever or vomiting. - **Rest: ** Allow your body to rest and recover, as malaria can be physically draining 19 4. **Prevention and Follow-up:** - After completing the course of medication, continue to take prophylactic antimalarials if advised by your healthcare provider for future travel to malaria-endemic areas. Female - Follow up with your healthcare provider for any post-treatment concerns or recommendations. 5. **General Tips:*1 Medical History - Carry a malaria diagnosis certificate if traveling internationally, as it may be required for entry and exit.

- Use insect repellent containing DEET (N,N-diethyl-meta-toluamide) and wear long-sleeved shirts and pants to None protect against mosquito bites Remember, malaria is a serious disease that requires prompt and appropriate medical treatment. Always consult a healthcare professional for accurate diagnosis, treatment, and guidance regarding your specific Generate Treatment Plan

Use via API 🌠 · Built with Gradio 😂 · Settings 🅸

14.Known Issues

- Model may load slowly in Colab.
- Long responses may exceed token limits.

• Results are **not medical advice** (informational only).

15. Future Enhancements

- Add patient chatbot with safe guardrails.
- Add analytics dashboard (with Plotly).
- Multi-language support.
- Secure login & role-based access.