HealthAI Assistant Documentation

# 1. Project Overview

- Project Name: HealthAI Assistant  
- Purpose: A medical AI assistant that helps patients with disease prediction, treatment suggestions, health analytics, and medication information.  
- Technology Stack: Python, Gradio, Transformers (IBM Granite 3.2-2b Instruct model), PyTorch, Pandas, Plotly, Streamlit (optional), PyNgrok.  
- Key Features:  
 - Symptom-based disease prediction  
 - Personalized treatment plan generation  
 - AI-powered patient chat  
 - Health analytics dashboard  
 - Tablet/medication reference

# 2. System Architecture

- Front-End: Gradio interface with tabs for Disease Prediction, Treatment Plan, Patient Chat, Health Analytics, Tablet Info  
- Back-End:  
 - IBM Granite AI model for NLP tasks  
 - Functions for generating responses, analyzing symptoms, producing health insights  
 - Data handling using Pandas  
- Optional Deployment: Streamlit + PyNgrok for web deployment

# 3. Installation & Setup

```bash  
# Install dependencies  
pip install transformers torch gradio -q  
pip install streamlit pandas numpy plotly datetime timedelta -q  
pip install streamlit pyngrok  
```  
- Load IBM Granite Model:  
```python  
from transformers import AutoTokenizer, AutoModelForCausalLM  
tokenizer = AutoTokenizer.from\_pretrained("ibm-granite/granite-3.2-2b-instruct")  
model = AutoModelForCausalLM.from\_pretrained("ibm-granite/granite-3.2-2b-instruct")  
```  
- Run Application:  
```python  
app.launch(share=True)  
```  
- Supports CPU or GPU execution automatically.

# 4. Functional Modules

4.1 Disease Prediction  
- Input: Symptoms  
- Output: Possible conditions, general medications, lifestyle suggestions  
- Method: Uses Granite AI model with custom prompt  
  
4.2 Treatment Plan  
- Input: Condition, Age, Gender, Medical History  
- Output: Personalized treatment suggestions including home remedies, medications, precautions  
  
4.3 Patient Chat  
- AI-powered chatbot for answering health queries  
- Maintains conversation history  
  
4.4 Health Analytics  
- Generates sample patient health data (heart rate, blood pressure, glucose)  
- Produces charts (line charts for trends, pie chart for symptom frequency)  
- Provides AI insights  
  
4.5 Tablet Information  
- Displays information about 15 popular medications  
- Includes purpose of each tablet

# 5. User Guide

1. Save Patient Profile: Fill in patient info on the left sidebar and click Save Profile.  
2. Disease Prediction: Enter symptoms → click Analyze Symptoms → view possible conditions.  
3. Treatment Plan: Enter condition, age, gender, history → click Generate Treatment Plan.  
4. Patient Chat: Type question → hit Enter or submit → chatbot responds.  
5. Health Analytics: Click Generate Analytics → view charts and insights.  
6. Tablet Info: Browse 15 common medications with purposes.

# 6. Sample Outputs

- Disease Prediction: "Possible conditions: Common Cold, Flu; Suggested medications: Paracetamol; Consult a doctor for further evaluation."  
- Treatment Plan: Personalized instructions including home remedies and precautions.  
- Patient Chat: Interactive Q&A responses.  
- Health Analytics: Heart rate chart, symptom frequency pie chart, textual health insights.

# 7. Future Enhancements

- Integration with real patient data  
- Cloud deployment with secure access  
- Multi-language support  
- Voice-based interaction  
- Integration with wearable health devices