HEALTH AI - Project Report

Project Heading: Health AI

Team Members:

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1. Introduction

The Health AI project leverages IBM Granite AI models to assist in medical support tasks such as disease prediction and treatment plan suggestions. It demonstrates the application of artificial intelligence in healthcare through a user-friendly Gradio interface. Disclaimer: This tool is for informational purposes only and not a replacement for professional medical advice.

2. Project - Purpose

The purpose of Health AI is to:

- Provide quick insights into possible conditions from reported symptoms.
- Suggest treatment approaches considering patient age, gender, and medical history.
- Explore the safe use of AI in healthcare support.

Features

- Conversational Interface – Interactive natural language support.
- Policy Summarization – Simplifies lengthy healthcare documentation.
- Resource Forecasting – Predictive use of patient/health data.

- Eco-Tip Generator – Wellness suggestions for healthy living.
- Multimodal Input Support – Accepts text and structured inputs.
- Streamlit or Gradio UI – Simple, interactive dashboards.

3. Architecture

Frontend (Streamlit/Gradio): Provides user interface with tabs for symptoms analysis and treatment plans.
Backend (FastAPI): Handles API endpoints, connects to IBM Granite model, processes user inputs, and returns predictions.

4. Setup Instructions

Prerequisites:
- Python 3.9 or later
- pip package manager
- IBM Granite model access
- Internet connectivity

Installation Process:
1. Clone repository.
2. Install dependencies (transformers, torch, gradio).
3. Configure environment with credentials if required.
4. Run FastAPI backend server.
5. Launch frontend via Streamlit or Gradio.

5. Folder Structure

- app/ – Backend logic
- api/ – API routes
- ui/ – Gradio/Streamlit UI components
- model/ – Granite model loading
- notebooks/ – Jupyter/Colab files
- scripts/ – Utility scripts for processing

6. Running the Application

1. Start the backend server with FastAPI.
2. Run the Gradio app for UI.
3. Enter symptoms for disease prediction.
4. Provide patient details for treatment plans.
5. View real-time AI responses and recommendations.

7. API Documentation

- POST /predict-disease – Accepts symptoms and returns possible conditions.
- POST /treatment-plan – Generates treatment suggestions from patient data.
- GET /status – Health check of API.

8. Authentication

This demo runs in an open environment. For production, security can include:

- Token-based authentication (JWT)
- OAuth2 with IBM credentials
- Role-based access controls

9. User Interface

The interface uses Gradio tabs for Disease Prediction and Treatment Plans.

It allows text inputs for symptoms, condition, and history, plus dropdowns for gender and numeric fields for age.

10. Testing

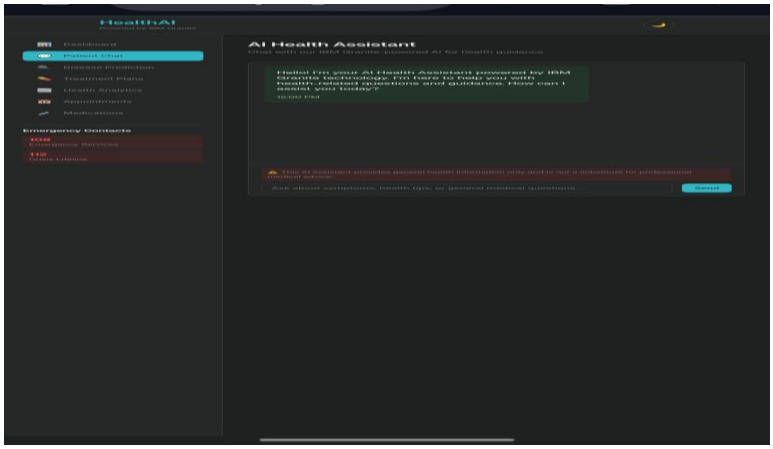
Testing Phases:

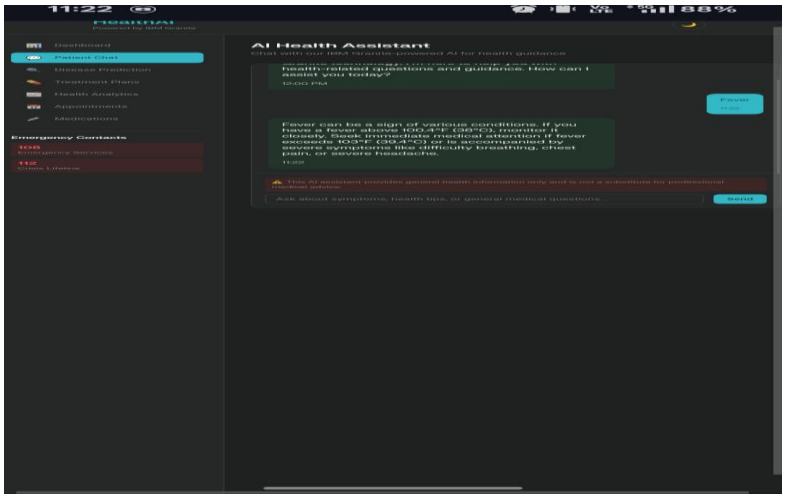
- Unit Testing: Functions for prompt generation.
- API Testing: Tested with Postman and direct calls.

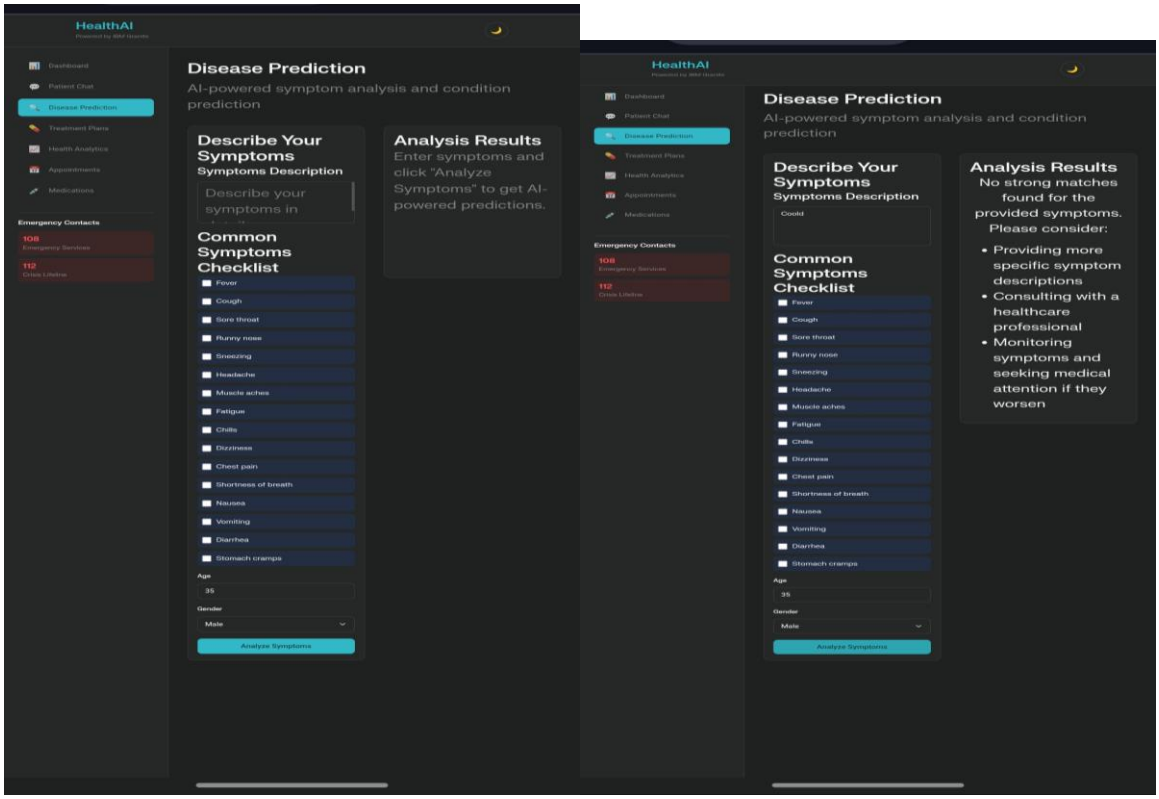
- Manual Testing: Symptom and condition input validation.
- Edge Case Handling: Empty inputs, long text, invalid values.

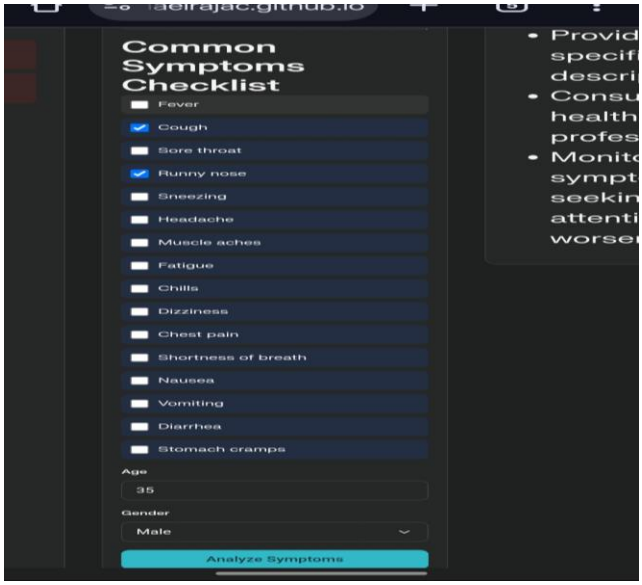
11. Screenshots

Screenshots of the Gradio UI and outputs can be added here.






HealthAI
Disease Prediction
AI-powered symptom analysis and condition prediction
Describe Your Symptoms
Symptoms Description
Describe your symptoms in
Common Symptoms Checklist
Fever
Cough
Sore throat
Runny nose
Sneezing
Headache
Muscle aches
Fatigue
Chills
Dizziness
Chest pain
Shortness of breath
Nausea
Vomiting
Diarrhea
Stomach cramps
Age
35
Gender
Male
Analyze Symptoms
Analysis Results
Enter symptoms and click "Analyze Symptoms" to get AI-powered predictions.
HealthAI
Disease Prediction
AI-powered symptom analysis and condition prediction
Describe Your Symptoms
Symptoms Description
Coold
Common Symptoms Checklist
Fever
Cough
Sore throat
Runny nose
Sneezing
Headache
Muscle aches
Fatigue
Chills
Dizziness
Chest pain
Shortness of breath
Nausea
Vomiting
Diarrhea
Stomach cramps
Age
35
Gender
Male
Analyze Symptoms
Analysis Results
No strong matches found for the provided symptoms. Please consider:
Providing more specific symptom descriptions
Consulting with a healthcare professional
Monitoring symptoms and seeking medical attention if they worsen


Common Symptoms Checklist
Fever
Cough
Sore throat
Runny nose
Sneezing
Headache
Muscle aches
Fatigue
Chills
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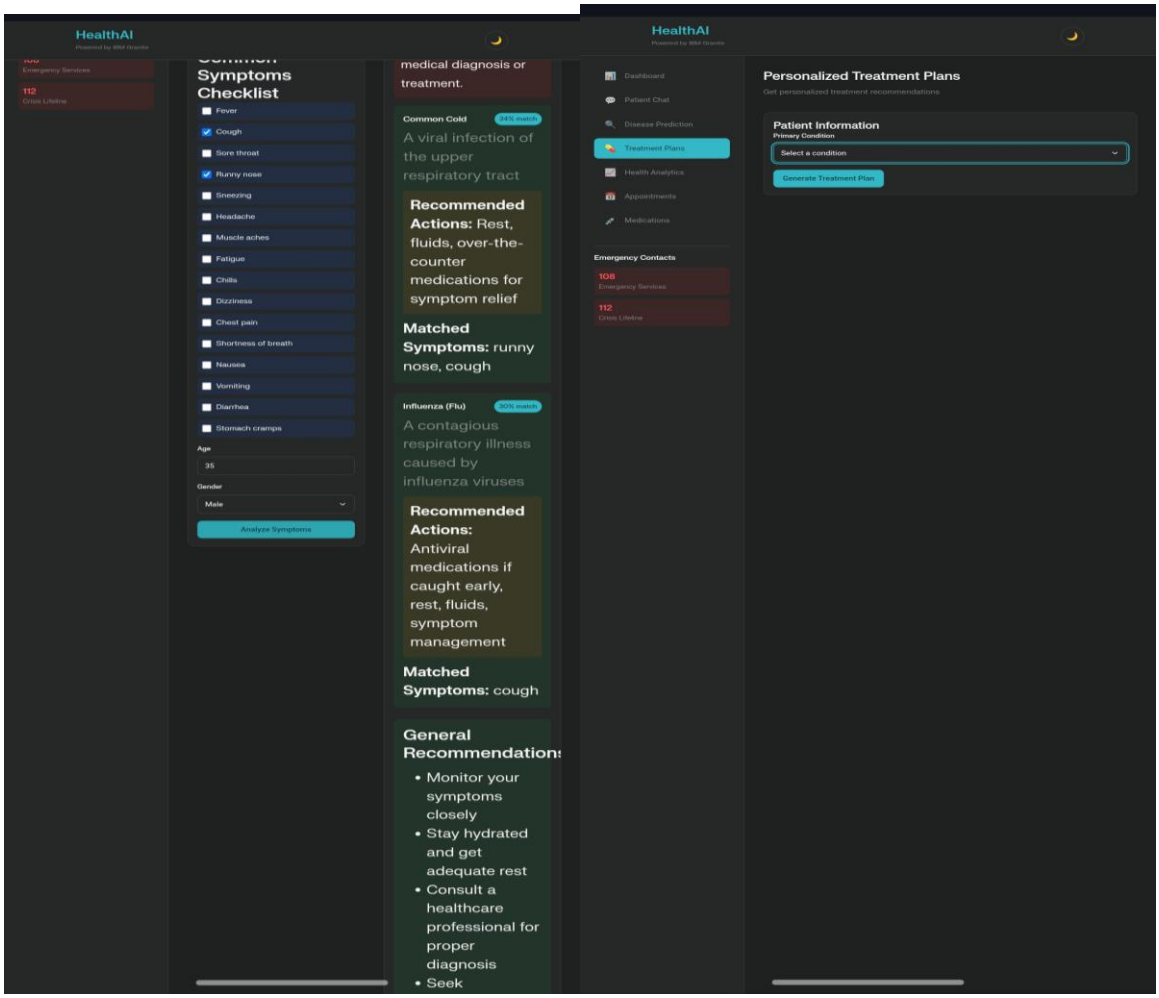
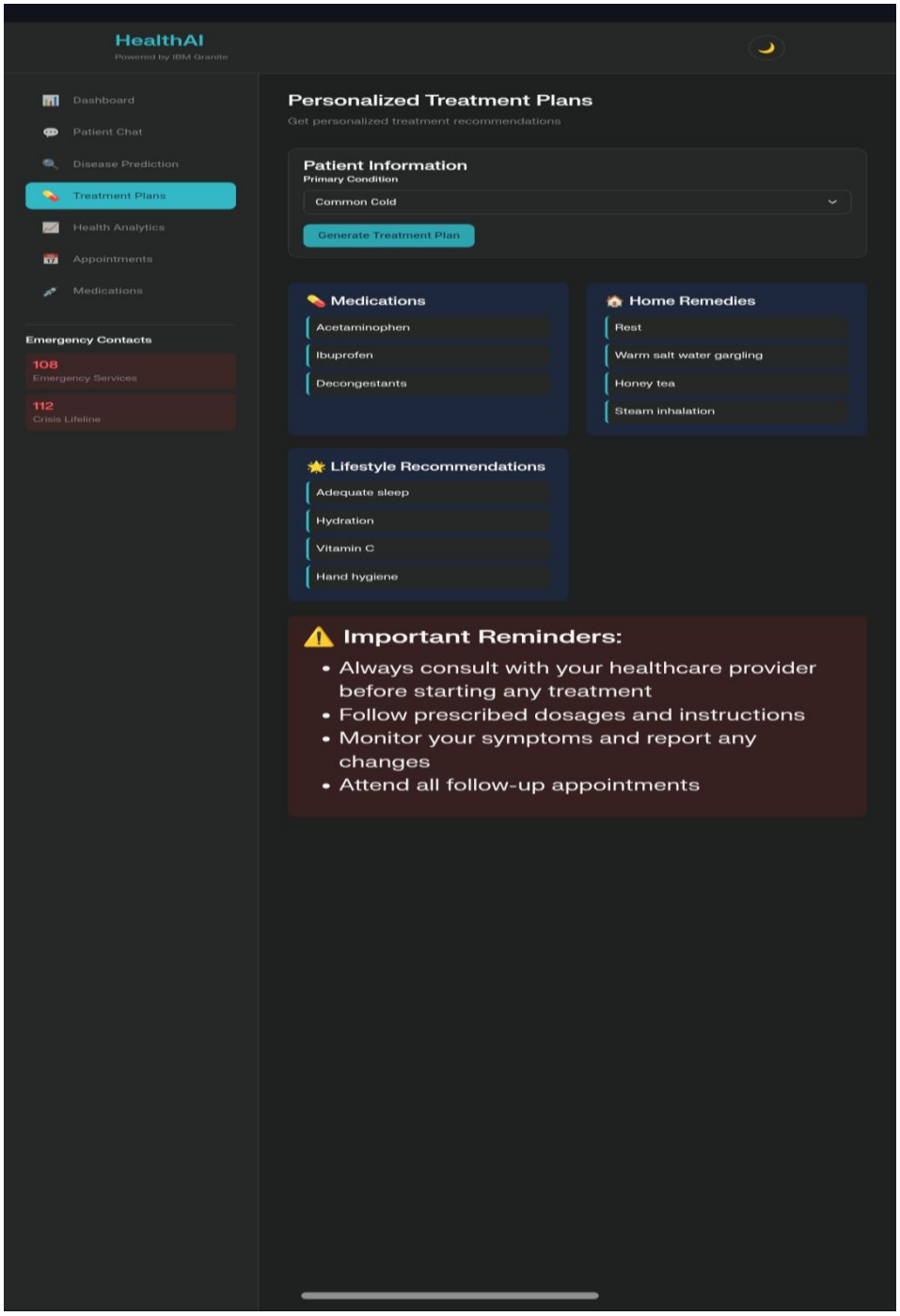
Analyze Symptoms


HealthAI
Powered by IBM Granite
Emergency Services
112
Crisis Lifeline
Symptoms Checklist
Fever
Cough
Sore throat
Runny nose
Sneezing
Headache
Muscle aches
Fatigue
Chills
Dizziness
Chest pain
Shortness of breath
Nausea
Vomiting
Diarrhea
Stomach cramps
Age
35
Gender
Male
Analyze Symptoms
medical diagnosis or treatment.
Common Cold
A viral infection of the upper respiratory tract
Recommended Actions: Rest, fluids, over-the-counter medications for symptom relief
Matched Symptoms: runny nose, cough
Influenza (Flu)
A contagious respiratory illness caused by influenza viruses
Recommended Actions: Antiviral medications if caught early, rest, fluids, symptom management
Matched Symptoms: cough
General Recommendations
Monitor your symptoms closely
Stay hydrated and get adequate rest
Consult a healthcare professional for proper diagnosis
Seek
HealthAI
Powered by IBM Granite
Dashboard
Patient Chat
Disease Prediction
Treatment Plans
Health Analytics
Appointments
Medications
Emergency Contacts
108
Emergency Services
112
Crisis Lifeline
Personalized Treatment Plans
Get personalized treatment recommendations
Patient Information
Primary Condition
Select a condition
Generate Treatment Plan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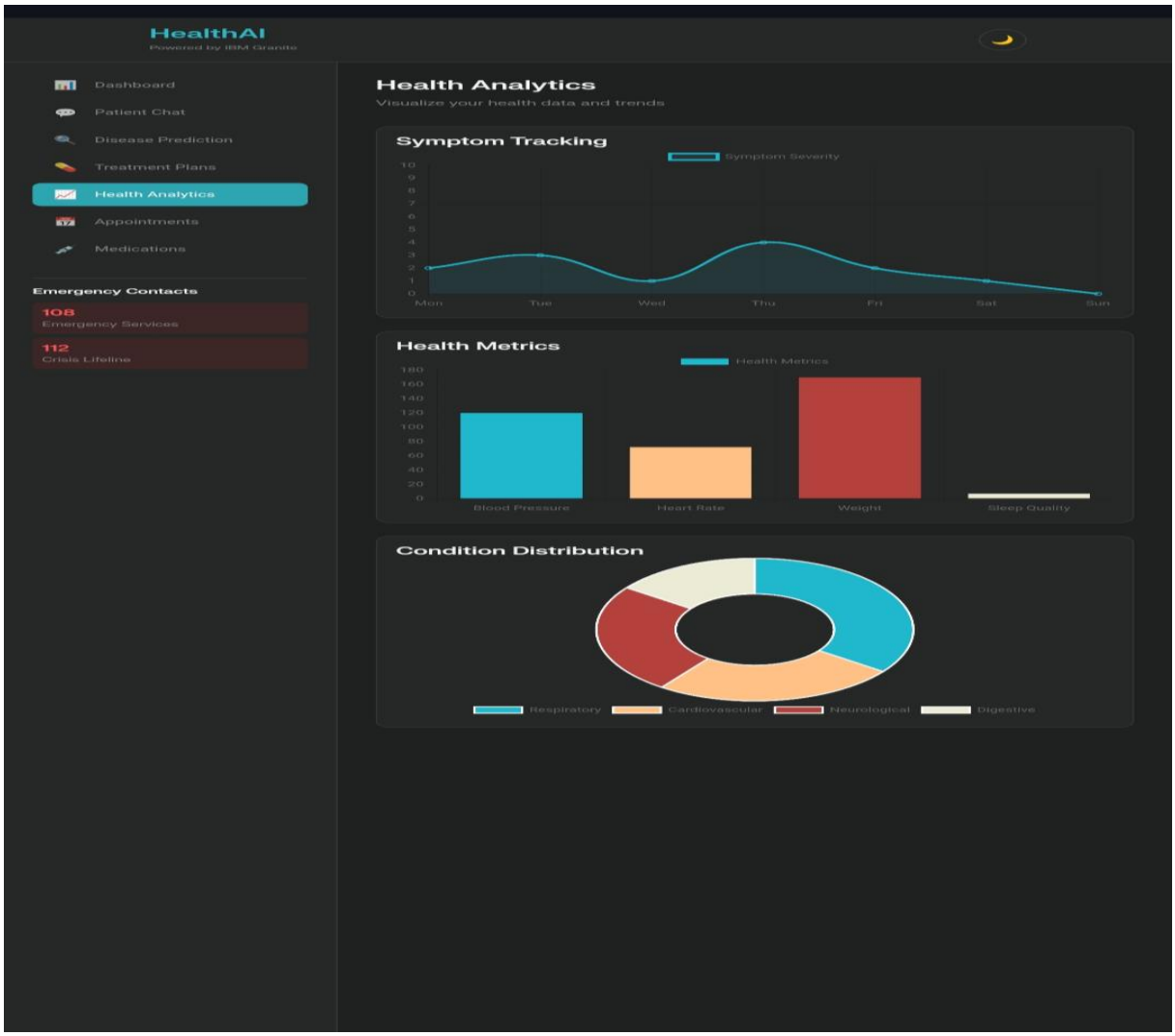
Personalized Treatment Plans
Get personalized treatment recommendations
Patient Information
Primary Condition
Common Cold
Generate Treatment Plan
Medications
Acetaminophen
Ibuprofen
Decongestants
Home Remedies
Rest
Warm salt water gargling
Honey tea
Steam inhalation
Lifestyle Recommendations
Adequate sleep
Hydration
Vitamin C
Hand hygiene
Important Reminders:
Always consult with your healthcare provider before starting any treatment
Follow prescribed dosages and instructions
Monitor your symptoms and report any changes
Attend all follow-up appointments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Dashboard
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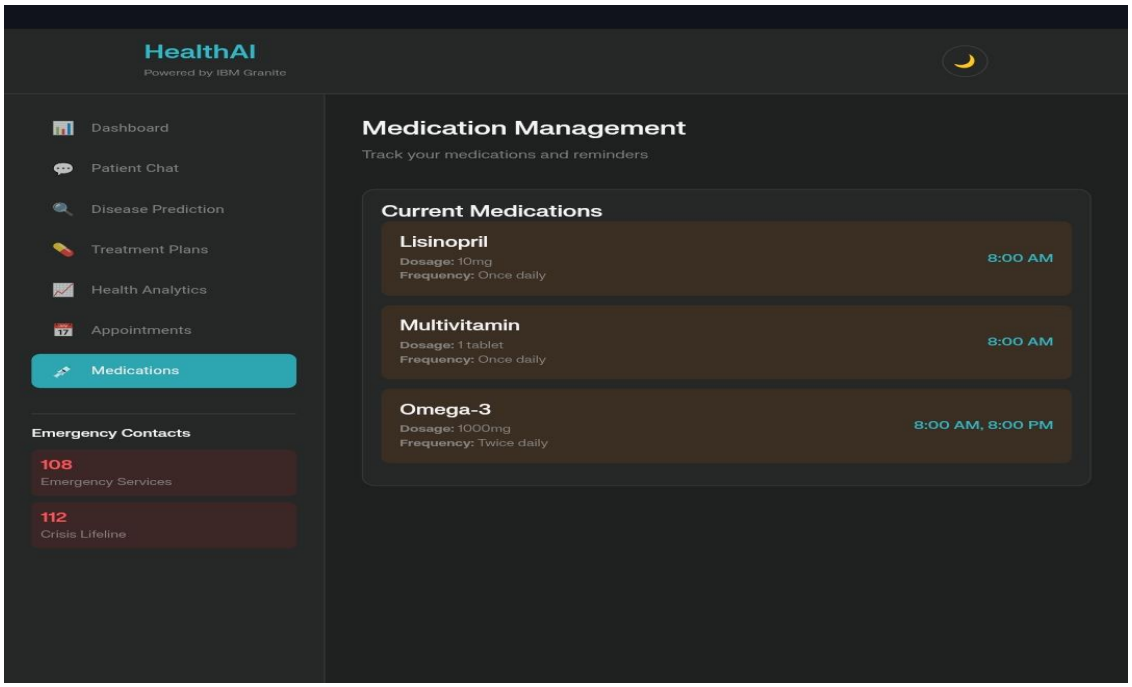
Disease Prediction
Treatment Plans
Health Analytics
Appointments
Medications
Emergency Contacts
108
Emergency Services
112
Crisis Lifeline
Health Analytics
Visualize your health data and trends
Symptom Tracking
Symptom Severity
10
9
8
7
6
5
4
3
2
1
0
Mon
Tue
Wed
Thu
Fri
Sat
Sun
Health Metrics
Health Metrics
180
160
140
120
100
80
60
40
20
0
Blood Pressure
Heart Rate
Weight
Sleep Quality
Condition Distribution
Respiratory
Cardiovascular
Neurological
Digestive



12. Known Issues

- Limited accuracy due to model generalization.
- Requires GPU for fast responses.
- No integration with medical databases yet.

13. Future Enhancements

- Multi-language support for global accessibility.
- Integration with real medical datasets and EHR.
- Mobile app deployment.
- Advanced analytics and visualization.