**Healthcare AI**

**Project – Documentation**

**1.Introduction**

* Project title **: Healthcare AI**
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# Overview

The **Healthcare AI Project** is designed to provide basic medical insights based on user inputs such as symptoms, conditions, and medical history. It uses a large language model (LLM) to analyze the input and suggest possible conditions and treatment options with a strong emphasis on **consulting qualified healthcare professionals**.

# Objectives

To assist users in understanding potential causes of their symptoms.

* To provide general treatment recommendations based on common medical conditions.
* To demonstrate the application of LLMs in health-related use cases.  To create an accessible, user-friendly interface for non-experts.

# Features

* ✅ Symptom-based disease prediction
* ✅ Personalized treatment suggestions
* ✅ Tabbed UI using Gradio
* ✅ Support for gender and age-specific recommendations
* ✅ Clear medical disclaimers

# System Architecture

[User Interface (Gradio)]

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[Input Processing (Symptoms/Condition)]

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[LLM Prompt Engineering Module]

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[IBM Granite 3.2 2B Instruct Model]

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[Response Generator (Parsed Text Output)]

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[Display to User with Disclaimers]

# Functional Modules

## 1. Symptom Analyzer

* Input: List of symptoms
* Output: Possible conditions and basic medication/home care suggestions

## 2. Treatment Plan Generator

 Input: Condition, age, gender, and medical history

Output: General treatment suggestions, lifestyle changes, and home remedies

## 3. Prompt Builder

 Customizes model input prompt based on the selected module

# Installation Guide

## Prerequisites

python3 -m venv venv

source venv/bin/activate # or venv\Scripts\activate on Windows pip install torch transformers gradio

# Usage Guide

**To Run the Application**

python app.py

## Interface Tabs

* **Disease Prediction**: Input symptoms like "fever, headache" to get condition suggestions.
* **Treatment Plan**: Input condition (e.g., "asthma"), age, gender, and history to generate a care plan.

# Limitations & Ethical Considerations

* This application does **not** provide real diagnoses.
* It is **not approved by medical regulatory bodies**.
* **Biases in training data** may affect model accuracy.
* **Model hallucination** is possible – verify outputs with a medical professional.

# Future Enhancements

* ✅ Add user authentication & medical data protection
* ✅ Integrate real-time symptom databases (e.g., ICD-10)

✅ Multilingual support

* ✅✅ Connect to live healthcare provider APIs
* ✅ Add logging & analytics for research purposes