HEALTH AI-Requirement Analysis:

# 1. Introduction

The Medical AI Assistant is an AI-powered application that provides informational healthcare guidance. It takes symptoms or medical conditions as input and generates possible disease predictions or general treatment suggestions. The system uses the IBM Granite-3.2-2B-Instruct model integrated with Gradio for an interactive user interface.  
  
Disclaimer: This system is designed for educational and informational purposes only and does not replace professional medical consultation.

# 2. Purpose

The purpose of the requirement analysis is to:  
- Identify functional and non-functional requirements.  
- Define inputs, outputs, and constraints.  
- Provide a clear understanding of user needs.  
- Serve as a foundation for system design and implementation.

# 3. User Requirements

The target users are patients, students, and general users who want quick, AI-generated health information.  
  
User expectations:  
- Simple interface for inputting symptoms/conditions.  
- Accurate, clear, and easy-to-understand health guidance.  
- Availability of both disease prediction and treatment suggestions.  
- Strong emphasis on disclaimers to avoid misuse.

# 4. Functional Requirements

1. Disease Prediction Module  
 - Input: Symptoms entered as text.  
 - Process: LLM analyzes symptoms.  
 - Output: Possible conditions and general recommendations.  
  
2. Treatment Plan Module  
 - Input: Condition, age, gender, and medical history.  
 - Process: LLM generates treatment suggestions.  
 - Output: Personalized treatment plan including home remedies and guidelines.  
  
3. User Interface (UI)  
 - Interactive Gradio-based UI with tabs.  
 - Separate sections for Disease Prediction and Treatment Plan.  
 - Textbox inputs and outputs.  
 - Buttons to trigger analysis.

# 5. Non-Functional Requirements

- Performance: Response should be generated within 5–10 seconds.  
- Usability: Simple, clear, and intuitive design.  
- Reliability: Must not crash with invalid inputs.  
- Ethics and Safety: Always display disclaimers, avoid prescriptions or exact dosages.  
- Scalability: Extendable with additional features (e.g., more medical conditions).

# 6. System Requirements

Hardware Requirements:  
 - Minimum: Intel i5/AMD equivalent, 8GB RAM, 2GB free storage, GPU optional.  
 - Recommended: Intel i7/AMD Ryzen 7, 16GB RAM, NVIDIA CUDA GPU.  
  
Software Requirements:  
 - OS: Windows/Linux/macOS  
 - Python 3.8+  
 - Libraries: transformers, torch, gradio

# 7. Constraints

- Internet connection required to download model initially.  
- Dependent on LLM’s training data (may not cover rare diseases).  
- Cannot provide real-time emergency solutions.  
- Ethical constraint: Must emphasize doctor consultation.

# 8. Assumptions

- Users provide accurate symptoms/conditions.  
- Users understand that this is not a diagnostic tool.  
- System will be used for informational purposes only.

# 9. Use Case Scenarios

Use Case 1: Disease Prediction  
Actor: User  
Steps:  
1. User enters symptoms (e.g., 'fever, cough, fatigue').  
2. Clicks Analyze Symptoms.  
3. System generates possible conditions and suggestions.  
  
Use Case 2: Treatment Plan  
Actor: User  
Steps:  
1. User enters condition (e.g., 'diabetes'), age, gender, and history.  
2. Clicks Generate Treatment Plan.  
3. System generates general treatment suggestions and home remedies.

# 10. Requirement Prioritization

- High Priority: Disease Prediction, Treatment Plan, UI, Disclaimers.  
- Medium Priority: Scalability, Optimization for GPU/CPU.  
- Low Priority: Advanced analytics, multilingual support.