# General Health Query Chatbot

**1. Project Overview**

**Objective:**

Develop an AI-powered chatbot that can understand and respond to general health-related queries, providing accurate and reliable information about symptoms, diseases, medications, and mental health.

**2. Scope of the Project**

This project aims to deliver an intelligent chatbot system capable of understanding user inputs in natural language and providing medically sound responses based on curated medical datasets. The chatbot should handle a wide range of health-related queries and serve as an initial point of consultation, though not a replacement for professional medical advice.

**3. Functional Requirements**

**Natural Language Processing (NLP)**

* Implement an NLP model to interpret and process user queries.
* Techniques such as tokenization, named entity recognition (NER), and intent classification will be applied.

**Machine Learning / Deep Learning Integration**

* Utilize pre-trained language models (e.g., BERT, BioBERT, or DistilBERT) fine-tuned on medical-specific datasets.
* Apply classification or retrieval-based architectures to determine the best possible response.

**Response Categories**

* **Symptoms** – Identify and provide information based on reported symptoms.
* **Diseases** – Offer detailed insights and guidance about specific diseases.
* **Medications** – Explain the use, side effects, and dosages of medicines.
* **Mental Health** – Provide supportive responses for mental health concerns using a compassionate and informative tone.

**4. System Architecture**

**1. Preprocessing Layer**

* Text normalization, removal of stop words, lemmatization.

**2. NLP & ML/DL Pipeline**

* Query encoding using transformers (e.g., BioBERT).
* Response retrieval/classification using deep learning model.
* Confidence thresholding for response selection.

**5. Expected Outcome**

The final deliverable will be:

* A fully functional chatbot that can interact with users in natural language.
* Accurate and contextually relevant answers to health-related questions.
* Accessible via a web application interface for ease of use.

**6. Tools & Technologies**

* **Languages & Frameworks**: Python, Flask/FastAPI, Streamlit
* **NLP Libraries**: Hugging Face Transformers, spaCy, NLTK
* **ML Frameworks**: TensorFlow, PyTorch, scikit-learn
* **Deployment**: Heroku, Render, or local hosting.