Project Report: HealthCare Chatbot

Submitted By:  
Shahmeer Hussain  
su92-bsaim-f23-117

Submitted To:  
Sir Rasikh Ali

# 1. Introduction

The HealthCare Chatbot is a web-based application designed to assist users in identifying possible health issues based on symptoms described in natural language. This chatbot leverages Flask (Python web framework) and Natural Language Processing (NLP) techniques to simulate a human-like interaction for preliminary health assessment and guidance.

# 2. Objective

The main objectives of this project are:  
- To develop a simple, user-friendly chatbot interface.  
- To analyze user-input symptoms using NLP techniques.  
- To provide possible disease suggestions and basic precautionary advice.  
- To enable users to explore medical conditions before seeing a doctor.

# 3. Technologies Used

|  |  |
| --- | --- |
| Component | Technology |
| Backend | Python, Flask |
| NLP | Natural Language Toolkit (NLTK) |
| Frontend | HTML, CSS, JavaScript |
| Data Handling | Pandas |
| Deployment | Localhost (development mode) |

# 4. System Architecture

1. User Input: The user interacts with the chatbot via a simple web form.  
2. NLP Module: The input is processed using NLP to extract symptoms and match them to potential diseases.  
3. Prediction Logic: Based on symptom-disease mapping from a dataset (CSV file), relevant conditions are predicted.  
4. Response Generation: The chatbot sends back an appropriate response, including:  
 - Possible condition  
 - Description  
 - Precautionary measures

# 5. Dataset

The chatbot uses a CSV file containing:  
- Symptoms  
- Diseases  
- Descriptions  
- Precautions  
  
This dataset is preprocessed and used for matching user input against known symptoms.

# 6. Features

- Accepts natural language symptom input.  
- Provides likely medical conditions based on symptoms.  
- Offers basic descriptions and safety advice.  
- Simple and interactive user interface.  
- Easy to run on local development server using Flask.

# 7. How to Run the Project

Steps to Set Up:  
```  
python -m venv env  
source env/bin/activate # (Use `env\Scripts\activate` on Windows)  
pip install -r requirements.txt  
python app.py  
```  
  
Usage:  
- Open the browser and go to: http://127.0.0.1:5000/  
- Enter symptoms in the chatbox and get health-related feedback.

# 8. Limitations

- Not a substitute for professional medical advice.  
- Relies on static dataset (limited to dataset coverage).  
- Does not handle emergency scenarios.

# 9. Future Enhancements

- Integration with real-time medical APIs like Infermedica.  
- Addition of multilingual support.  
- Deployment on cloud platforms for public access.  
- Appointment booking and user profile features.

# 10. Conclusion

This project demonstrates how machine learning and NLP can be used to build practical healthcare tools. The HealthCare Chatbot provides an easy entry point for users to interact with AI for basic medical insights and fosters awareness about the potential of AI in healthcare.