**Report**

**Project Report**

**Title: AI Medical Consultation System**

**Submitted By:**

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**Introduction:**

The AI Medical Consultation System is an intelligent and automated healthcare solution designed to assist patients in preliminary medical consultation and symptom analysis. It aims to provide users with initial guidance based on their symptoms before consulting a doctor.

This project utilizes Python programming, integrating machine learning algorithms, Natural Language Processing (NLP), and several third-party APIs to simulate a real-world medical consultation system.

**Objective:**

* To design an AI-powered medical consultation system that can collect symptoms from the user and suggest possible medical conditions.
* To recommend further actions like consulting a doctor or taking precautions.
* To automate preliminary medical advice and reduce the load on healthcare professionals for basic queries.

**Technologies Used:**

**1. Python 3.x**

Python is used as the core programming language for the entire system due to its simplicity and rich set of libraries.

**Libraries and APIs Used:**

**1. sklearn (Scikit-learn)**

* Used for machine learning algorithms.
* Implements the Naive Bayes classification model for predicting diseases based on user symptoms.

**2. pandas**

* For data manipulation and analysis.
* Used to manage the dataset containing symptoms and diseases.

**3. numpy**

* For numerical computations and matrix operations.

**4. Flask**

* Lightweight web framework used to create the API endpoints.
* Handles HTTP requests and responses for user interactions.

**5. joblib**

* Used to save and load the trained machine learning model for prediction purposes.

**6. json**

* For handling data in JSON format while interacting with APIs.

**Dataset Used:**

* A CSV file containing a list of symptoms and corresponding diseases. (Can be used currently working with predefined dataset)
* The dataset also contains precautionary steps and descriptions of diseases.

**System Architecture:**

**1. Symptom Collection:**

* User inputs the symptoms through the user interface or API endpoint.

**2. Symptom Analysis:**

* The system uses the trained Naive Bayes model to predict the most likely disease based on the symptoms provided.

**3. Recommendation Generation:**

* The system suggests:
  + The most likely disease.
  + Precautions to be taken.
  + A brief description of the disease.

**Working of the System:**

1. The user provides symptoms through a frontend interface or directly via an API request.
2. The symptoms are converted into a format suitable for the model.
3. The trained machine learning model predicts the possible disease.
4. The system fetches the description and precautions for the predicted disease from the dataset.
5. The response is sent back to the user in JSON format.

System WorkFlow

[ User Input ]

↓

[ Currency Converter Python Program ]

↓

[ API Call to Exchange Rate API ]

↓

[ Fetch & Parse Data ]

↓

[ Display Converted Amount ]

Module Flow

[ Start ]

↓

[ Take User Input (Amount, From Currency, To Currency) ]

↓

[ Validate Input ]

↓

[ Call API ]

↓

[ Extract Rates ]

↓

[ Calculate Conversion ]

↓

[ Display Output ]

**Advantages of the System:**

* Instant medical guidance.
* Easy-to-use interface.
* Reduces basic medical query load on doctors.
* Helpful in remote or rural areas where medical consultation is not easily accessible.

**Limitations:**

* The system provides preliminary consultation only and should not replace a real doctor.
* The prediction accuracy is dependent on the quality and quantity of the dataset.
* May not handle very complex symptoms or rare diseases.

**Future Enhancements:**

* Integration with real-time health monitoring devices.
* Multilingual support for users from different regions.
* Chatbot integration for interactive consultation.
* Addition of a larger and updated medical dataset.
* Video consultation feature with doctors.

**Conclusion:**

The AI Medical Consultation System developed by Uttam Khatik and Dipak Raval is a comprehensive healthcare solution leveraging artificial intelligence. It is a step forward toward making healthcare accessible and intelligent. While it cannot replace professional doctors, it can act as a supportive tool for basic symptom analysis and precautionary advice.