Predictive Healthcare

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1. Introduction / Background

This project focuses on predicting diseases based on symptoms provided by the user. The healthcare domain is rapidly evolving, and AI plays a key role in assisting doctors and patients. The motivation behind this project is to make early detection of diseases easier and more accessible, especially for people who may not have immediate access to doctors.

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2. Problem Statement

People often struggle to understand the severity of their symptoms, which may delay proper diagnosis and treatment. There is a need for a system that can provide quick predictions about possible diseases based on symptoms, helping patients take timely action.

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3. Objectives of the Project

- To develop a system that predicts possible diseases based on user input symptoms.
- To provide reliable predictions using AI/ML techniques.
- To create a user-friendly interface for easy interaction.
- To lay the foundation for future extension into prescription and report analysis.

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4. Scope of the Project

The project will cover prediction of diseases based on user-provided symptoms in text format. It will include 10 common diseases for Phase 1. Future scope includes extending the system to process medical reports and provide prescriptions. It will not replace professional medical advice but serve as a supportive tool.

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5. Existing System

Currently, symptom checkers and online tools provide basic information but often lack accuracy and personalization. Most existing systems do not give reliable predictions or are not user-friendly. This gap motivates the need for a more effective AI-driven system.

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6. Proposed System / Methodology

The proposed system will allow users to input symptoms in text form. The system will process these symptoms using NLP and machine learning models to predict the most probable disease. The architecture will consist of input processing, model prediction, and result display modules.

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7. Tools and Technologies to be Used

- Programming Language: Python
- Frameworks: Scikit-learn, Pandas, Numpy
- NLP Libraries: NLTK, Scikit-learn (TF-IDF)
- Database: CSV/SQLite (Phase 1)
- IDE: Jupyter Notebook / VS Code

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8. System Requirements

Hardware Requirements: Intel i3/i5 processor, 4GB RAM, 500MB free disk space
Software Requirements: Windows/Linux, Python 3.x, Required Python libraries (scikit-learn, pandas, nltk)

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9. Modules of the Project

- **Input Module** – Takes symptoms from the user.
- **Preprocessing Module** – Cleans and prepares text data.
- **Prediction Module** – Uses ML models to predict disease.
- **Output Module** – Displays predicted disease to the user.

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10. Expected Outcomes

The system will be able to predict diseases based on symptoms with good accuracy. Deliverables include a working model, dataset, and documentation. The prototype will demonstrate how AI can assist in healthcare by providing quick and helpful predictions.

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11. Applications

- Can be used by individuals for quick self-check.
- Helpful for primary healthcare centers with limited resources.
- Can serve as an assistant tool for doctors.

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12. Limitations of the Project

- The system cannot provide 100% accurate medical diagnosis.
- Accuracy depends on dataset quality.
- Cannot replace actual medical diagnosis by doctors.