Smart Healthcare Consultation for Cardiovascular Risk

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Abstract: The proposed idea is to create a smart health consultation using machine learning to give accuracy about heart disease risk a patient will have seen before consulting a doctor. The user can achieve the benefit of a smart health consultation only when it can diagnose a kind of disease and provide the necessary information. People nowadays suffer from a variety of heart diseases as a result of the environment and lifestyle choices. The lengthy process for a patient to visit a diagnostic center and consult a doctor. In machine learning approaches it is easy to solve this difficult problem. The user can easily predict the heart disease risk. The true objective is to design a model that can determine heart disease risk, with accuracy.

Keywords:- Machine Learning Algorithms, Decision Tree Algorithm And Prediction Algorithm.

INTRODUCTION

Our project proposes that the user will be able to work according to their time. We have developed the Smart Health Care Consultation Framework, a framework specialist.

which asks for and checks the patient's symptoms the patient gives the information properly then the system checks are stable are not. The framework is a programming process. it is also known as machine learning. Machine learning also helps people to make a judgment about diabetes according to the data calculated by the examinations, which may function as a reference for doctors. The first step was firstly the user login and in the second step after login, the user can check the heart . Now this processed data was given to the decision tree classifier and achieved 78.17% accuracy.

I. METHODS AND MATERIAL

1. Working System

- Data Pre-Processing:
This involves detecting and addressing missing data points in the dataset.

- Cleaned Data:

The processed and cleaned data is ready to be used for training and testing the machine learning model.

- Training Data:
A portion of the data is used to train the machine learning algorithm.

- Machine Learning Classification Algorithms: The decision tree algorithm is chosen as the classification algorithm for this system.

- Generated Classification Models:
The decision tree algorithm creates multiple classification models based on the training data.

- Evaluation of the Models:
The performance of the generated models is assessed using appropriate metrics to determine their accuracy and effectiveness.

- Best Classifier:
The model with the best performance is selected as the final classifier.

- Prediction:
The best classifier is used to make predictions on new, unseen data.
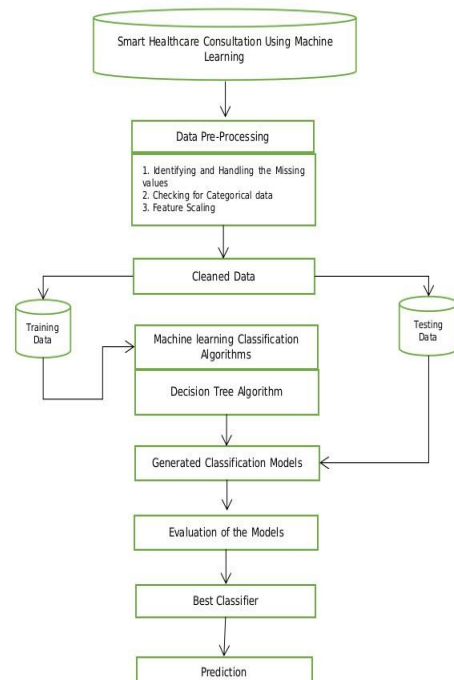
2. Algorithms Used

Decision Tree Algorithm

Decision tree algorithms are finding useful applications in the healthcare system because of their capacity to analyze complicated data sets and make actions based on a set of rules. Decision- making models are frequently used in the medical sector for patient risk evaluation, disease diagnosis, and therapy recommendations for diseases such as heart disease risk. The algorithm for machine learning uses the decision tree method to generate predictions. In machine learning, the decision tree algorithm is most frequently used to solve the classification problem. It can also be used to tackle regression problems.[2]
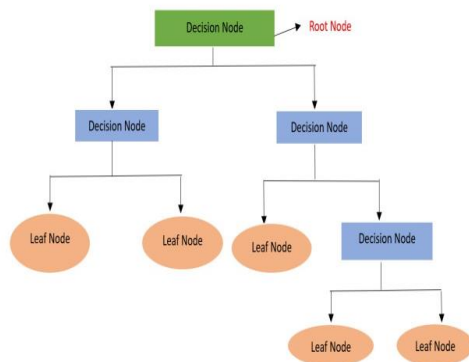
Predictive algorithm

The predictive algorithms can accurately predict the person's response to a medication or treatment plan based on genetic information, clinical history, and other data. It is used to evaluate historical and real-time data to make predictions. Predictive algorithms can be used to analyze patient utilization patterns.[3]

II. PROPOSED SYSTEM

Software Requirements:-

Programming Language:- Python

Machine Learning Libraries:- Install libraries like Matplotilblib, seaborn, joblib

Data Processing and Analysis: Utilize libraries like pandas and NumPy for data manipulation and analysis.

Web Development Framework: Select a framework like Anaconda to build the user interface for the consultation system.

Database: Set up a database to store patient information and consultation data. Options include SQLite.

User Authentication: Implement user authentication and access control measures to ensure data privacy and security

III RESULT

Step 1:- Home Page of Smart Healthcare consultation using machine learning website.

Step 2:- The user enters their symptoms into the application. The system processes the symptoms and provides a risk assessment for heart disease.


Step 3:- In this project, we have seen the information and symptoms of heart diseases like fbs(fasting blood sugar), ca(cardic arrest), restecg(resting electro cardiographic) etc. and also checked the accuracy of the diseases.

Step 4:- The system uses an algorithm to determine if the user is at risk of heart disease based on the entered symptoms. The system displays the if the user is at a risk of heart disease or not to the user.

Step 5 :- The user browses through doctor profiles to find a suitable doctor. The profiles include information about the doctor's specializations.

Step 6 :- The user selects a suitable doctor and books an available time slot for consultation. The booking information is updated in the system, and both the user and the doctor will get updated about the appointment.
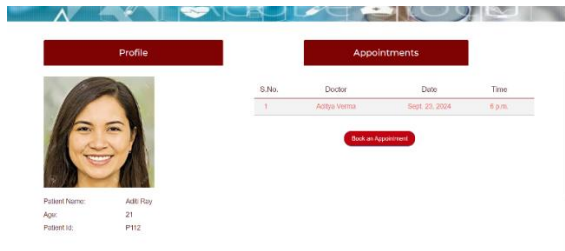
Step 7 :- The doctor logs into their dashboard to view booked appointments. The doctor can see the details of the patient who booked the slot and prepare for the consultation.
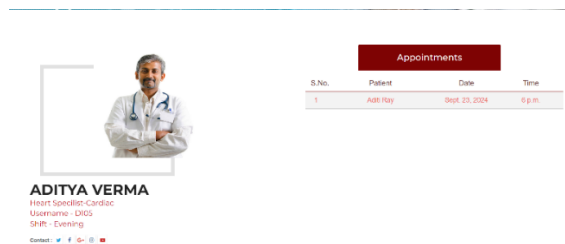
IV   LITERATURE SURVEY

Heart Disease Prediction By Sibgha Taqdess , Nayab Akhtar and Kanwal Dawood (February 2021) : The proposed method aims to predict the occurrence of heart disease for early detection using data mining techniques and machine learning algorithms. These include Naïve Bayes, k-Nearest Neighbor (KNN), Decision Tree, Artificial Neural Network (ANN), and Random Forest. [1]

Virtual Medical Assistant Using Machine Learning By K. Anitha , C. S. Aravind , K. Deepikha ,Department of Information Technology, Sri Venkateswara College of Engineering, Sriperumbudur, India(Volume 4, Issue 6, June 2021) : For Symptom Extraction : Speech to Text Conversion, Tokenization, Stop Words Removal, Pos Tagging. For Prediction : Decision Tree Classifier, Random forest classifier and Linear SVM. [2]

Smart Health Prediction Using Machine Learning by

Anil V Turukmane, Kandukuri Pranavi, Ballem Hema Sai Chandra Sekhar, Kollati Chandini, Aviraj Das Adhikar, VIT-AP, University (Volume 5, Issue 5, September-October 2023) : detect patterns & group patients with similar qualities, two techniques can be used and those are PCA (Principal Component Analysis) and k-means clustering. [3]

Heart Disease Prediction using Exploratory Data Analysis by R. Indrakumaria , T. Poongodib , Soumya Ranjan Jenac (NOVEMBER-2020) : This study utilizes Exploratory Data Analysis (EDA) to identify risk factors and predict heart disease using the K-means clustering algorithm on a publicly available heart disease dataset, analyzed and visualized with the Tableau tool. [4]

V   CONCLUSION

So our project, 'Smart Health Consultation using Machine Learning,' aims to implement a data- driven approach to and predict the likelihood of various heart diseases in individuals through symptoms like cholesterol, cardic arrest, age, sex, max heart rate. By employing advanced machine learning techniques and algorithms and leveraging relevant health data such as lifestyle factors, and physiological measurements, our system will analyze patterns   and indicators associated with these conditions with their particular disease. By integrating predictive models and decision support algorithms, our goal is to deliver accurate assessments and early warnings regarding the risk of heart disease.

Smart health systems can analyze a   patient's health data (such as blood pressure, cholesterol levels, and lifestyle factors) to detect early signs of cardiovascular risk. This enables timely intervention and prevention of severe conditions like heart attacks or strokes solving the problem of patients face significant delays in accessing specialized medical expertise and timely diagnoses, leading to suboptimal health outcomes. specially in terms of heart related problem as it have high risk.

VI   REFERENCES

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