SMART HEALTHCARE PREDICTION

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Abstract - *We have been afraid to go to the doctor in recent years because of the COVID's situation. So for minor diseases, weplanned to create a web application that will be helpful for people. Our motive is to create a system for the welfare of people. In this paper, we aim to predict user's diseases based on their symptoms. We implement the Decision Tree Algorithm to reach our goal, which helps to determine the patient's health condition after collecting their symptoms by predicting the disease. This web application can determine and extract previously unseen patterns, relations, and concepts related to multiple diseases from historical database records of specified multiple diseases. The paper presents an overview of the data mining techniques with their applications in the healthcare field. In health care areas, due to regulations and due to the availability of computers, a large amount of data is becoming available. Such a large amount of data cannot be processed by humans in a short time to make a diagnosis. One of the main objectives is to examine data mining techniques in healthcare applications in order to make the best decisions possible.*

Keywords- Data Mining, Healthcare, Decision Tree, Symptoms, and Web Application

I. INTRODUCTION

Health is one of our most valuable assets, and it has a direct impact on every sort of progress or development. Most people ignore this asset in today's hectic world, which may be due toa lack of time and the complexities of huge material available on the Internet. Data mining has brought a number of techniques that can help us fix this problem and concentrate on both health and work at the same time. In the modern period, Because there is a need for an effective analytical process for finding unknown and useful information in health data, data mining is becoming increasingly popular in the healthcare area. In the health industry, Data mining has various advantages in the health industry, including detection of health insurance fraud, and the availability of medical solutions to patients at lower cost, detection of causes of diseases, and identification of medical treatment methods. It also assists healthcare researchers in building effective healthcare policies, drug recommendation systems, individual health profiles, etc.

II. RELATED WORK

In the paper [1], the author Subasish Mohapatra, Prashanta Kumar Patra, Subhadarshini Mohanty, Bhagyashree Pati presented a paper that Data Mining helps us to understand a huge amount of unmined data is collected by the healthcare industry in order to discover hidden information for effective diagnosis and decision making. Data mining is the process of extracting hidden information from a massive dataset, categorizing valid and unique patterns in data. It might have happened so many times that you or someone needed doctor help but they are not available due to some reason. The health management system is a project that provides end-user support and digital consultation. Authors have proposed a system that allows users to get guidance on their health issues through intelligent health care online system. The main objective of the paper is to predict Chronic Kidney Disease (CKD),Heart Disease and Liver Disease using clustering technique, K-means algorithm.

In the paper [2], the author G.Pooja reddy, M.Trinath Basu, K.Vasanthi, K.Bala Sita Ramireddy, Ravi Kumar Tenalihave offered a framework that examines a patient at a basic level and suggests diseases that might be present. It starts by gathering information from the patient about their symptoms, and if the framework can identify the appropriate illness, it then recommends a specialist to the patients. On the off chance that the framework isn't sufficiently sure, it asks a few questions to the patients. When the system has accessed full data from the patient, then the framework will demonstrate the result.

In the paper [3], the author Pinky Saikia Dutta, Shrabani Medhi, Sunayana Dutta, Tridisha Das, Sweety Buragohain have presented a paper which is a web-based application for Predicting diseases based on user input symptoms. It mines data sets to forecast likely diseases and delivers remedial methods for Effective Treatment. The algorithm implemented in this paper is the Apriori algorithm by generating only one candidate set. This is due to the fact that our goal is to predict only one disease from a group of symptoms. In FP tree Generation, Item sets are considered in order of their descending value of support count. An item header table is created to make tree navigation easier, with each itempointing to its occurrences in the tree via a chain of node connections.

In the paper [4], the author Nikita Kamble, Manjiri Harmalkal, Manali Bhoir, Supriya Chaudhary, paper is Based on available cumulative information, the system

will show the result. Here they are using intelligent data mining techniques to guess the most accurate illness that could be associated with a patient's symptoms and based on the database of several patient's medical records, an algorithm (Naïve Bayes) is applied for mapping the symptoms with possible diseases.

In the paper [5], the author Ajinkya Kunjir, Harshal Sawant, Nuzhat F. Shaikh presents a paper that aims to builda basic decision support system that can determine and extract previously unseen patterns, relations, and concepts related to multiple diseases from a historical database record of specified multiple diseases. The suggested system can answer challenging questions about an illness and can assist medical practitioners to make smart clinical decisions that traditional decision support systems were not able to. Medical practitioners' decisions, aided by technology, can result in successful and low-cost therapies.

III. PROPOSED SYSTEM -

The core idea behind the project is to propose a system that allows users to get instant guidance on their health issues. Various symptoms and the disease/illness linked with those symptoms are supplied into this system. Users utilize this system to share their symptoms and problems. It then examines the user's symptoms to see if there are any illnesses that could be associated to it. It occurs frequently that one requires immediate medical assistance but is unable to obtain it due to a variety of factors. That's where Smart Healthcare Prediction System steps in and is of first-handhelp to diagnose a patient and suggest health remedies (for certain diseases). The health prediction system is a project that provides end-user support and digital consultation. We propose a method that allows users to get instant advice on their health problems via an online intelligent health care system. Various symptoms and diseases/illnesses connected with those symptoms are input into the system. Only if the system responds in this way can smart health be predicted. The final report will be prepared after these datasets have been compared to the incoming queries. Because this proposed methodology will be based on genuine historical data, it will produce accurate and timely results, allowing patients to receive immediate diagnose. More work can be done in the future by using more data sets related to diseases and by using different data reduction methods to improve the classification. For better accuracy and prediction of diseases the datasets that will be used must be quality-oriented and free from outliers, inconsistencies, and missing values. The main objective is to use data mining techniques in the health care system by making it beneficial in the medical field. By keeping your information private to provide you with help in times of emergency. Data mining combined with a health system will have good future scope. In this COVID's situation, we fear going out so we can sit at home and consult about ourhealth (contactless consultancy).
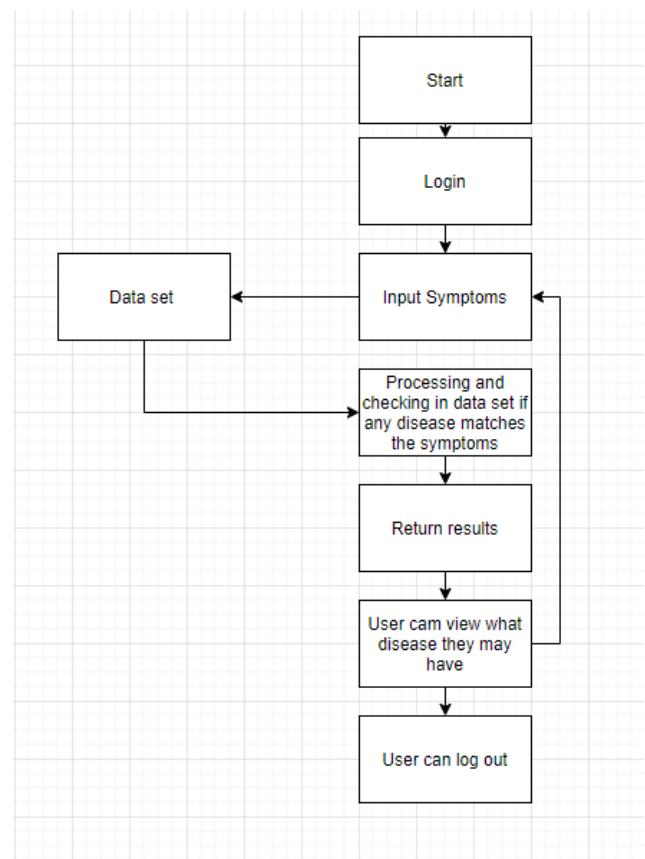

Figure 1: Flowchart of Proposed System

1. *Registration:*

For any user to register, the user has to enter a new username, password and few details like sex, age, E-mail Id, etc.

2. *Login:*

Users can access the web application using their username and password.

3. *Input Symptoms:*

The user enters the symptoms he or she is experiencing.

4. *Dataset:*

After entering the disease, we will process and check in the dataset whether any disease matches with the symptoms entered by the user.

5. *Result:*

In this step, we get the result of what disease the user is having. Users can view predicted disease on their screen and precautions that should be taken.

6. *Logout:*

After viewing, the user can log out from the system.

IV. ALGORITHM

A decision tree is a technology that is mainly used for classification and prediction. Learning of a decision tree is a typical algorithm based on the instance, which mainly focuses on classification rules. It is one of the popular techniques in the emerging field of data mining. Decision tree classification algorithms have been used for data mining, machine learning, and artificial intelligence. The development of machine learning algorithms is impacted by decision trees. A tree-like structure of decisions is drawn that can be visually represented and can be saved in the file format. A decision tree is a method of classifying examples. It is built in a top-down manner, requiring the division of data items into subsets. Those subsets contain instances with homogeneous values. A decision tree can be drawn like an upside-downtree. We begin with the root node and split the nodes at each level until we reach the leaf nodes, which represent the outcomes. In this healthcare, decision trees are built based ongood health conditions and healthy lifestyle practices. Patients who drink more alcohol, eat improper food, and do not live a healthy lifestyle are more likely to get diseases. Patients who consume more alcohol follow an unhealthy diet and do not follow a healthy lifestyle have more chances of suffering from diseases.

V. HARDWARE AND SOFTWAREREQUIREMENTS

Server Side :

Hardware Requirements :

- OS: Windows 7 or more
- Minimum 4GB RAM
- Having access to the Internet

Software Requirements:

- Python 3.6
- IDE: VSCode
- Python libraries:

Flask==1.1.2, numpy==1.19.5, pandas==1.1.5, joblib==1.0.0, Flask-Login==0.5.0, Flask-Mail==0.9.1 scikit-learn==0.24.0, scipy==1.5.4, sklearn
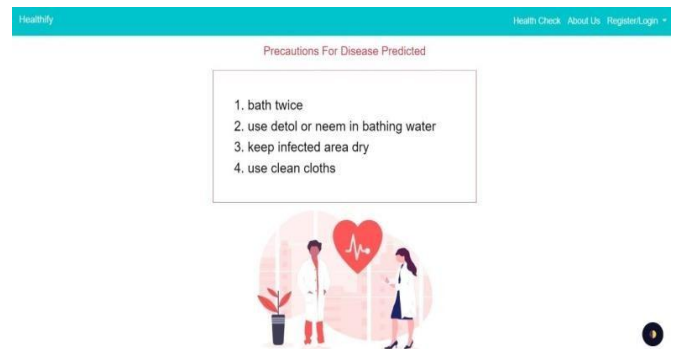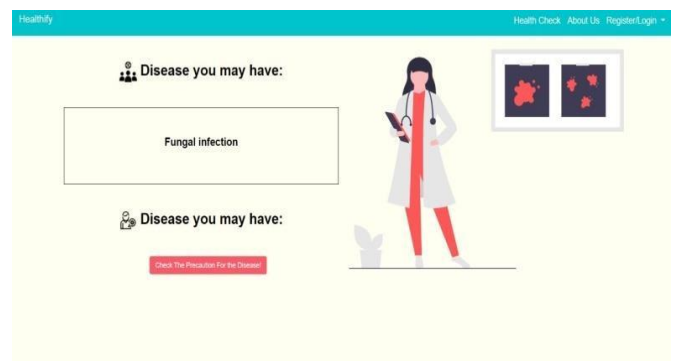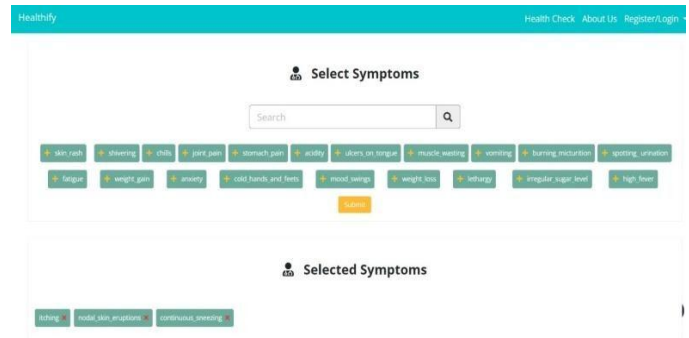
Client-Side :

Hardware Requirements

- Smart Mobile Phone and Laptop

Software Requirements

- Good Internet Connection
- Browser

VI. RESULTS

Input Symptoms:

VII. SCOPE

This system is free of cost and also traveling expenses are reduced, user just needs internet connection. This system helps to diagnose disease earlier before going to doctor. This system also tells us that what precautions we should take for that predicted disease.

VIII. CONCLUSION

The system would significantly reduce human effort, as well as the cost and time constraints associated with human resources, and expertise, and improve the diagnostic accuracy. The prediction of diseases using Data Mining applications is a difficult and dangerous undertaking because the data discovered is noisy,

irrelevant, and vast. In this case, data mining tools come in handy. Exploration of medical data knowledge and it is quite fascinating. Also, considering today's scenario where it's difficult to go and visit a doctor the system would be really helpful for the people to get to know what disease they have by simply entering their symptoms. The system will evaluate the results based on all the data entered by the user and answer all the questions asked by the system.

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