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Healthcare Assisting System using Logistic Regression & Decision Tree Classifier

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ABSTRACT: As the population is being increased constantly, it is highly essential to have good medical support, but it is found that numbers of doctors are less to serve the need of the increasing population. To encounter such cases there is a need for a healthcare assisting system. This system helps you to better visualize the presentation of mined data (information) and to predict the health problems before it goes severe by evaluating the desired symptoms. The main advantage of our system is that it will automatically suggest the best doctor by predicting the seriousness of the diagnosis for the specific health problem. A Machine Learning model is being created wherein we could give any text input and based on the training data it must analyze the symptoms. A Supervised Logistic Regression machine learning algorithm can be implemented to train the model with data sets containing various disease CSV files. The goal is to compare the outputs of various models and suggest the best model that can be used for symptoms in real world inputs.

KEYWORDS: Healthcare, machine learning, logistic regression, decision tree classifier, disease predictions

I.INTRODUCTION

Through this healthcare assisting system one can communicate with text interface and get reply through artificial intelligence. Typically, it will communicate with a real person. They are used in applications such as ecommerce customer service, call centers and Internet gaming. These are programs built to automatically engage with received messages.

The assisting system can be programmed to respond the same way each time, to respond differently to messages containing certain keywords and even to use machine learning to adapt their responses to fit the situation.

A developing number of hospitals, nursing homes, and even private centers, presently utilize online interactive agents for human services on their sites. They connect with potential patients visiting the site, helping them discover specialists and getting them access to the correct treatment.

Machine Learning model is developed using Logistic Regression algorithm which diagnosis the correct disease based on the symptoms given by the user. It performs the above operation with the help of Data sets containing CSV files with all the diseases compiled together.

This logistic regression algorithm in ML allows us to process the data efficiently. The goal here is to model the underlying structure or distribution of the data to learn more from the training set. In any case, the utilization of artificial intelligence in an industry where individuals' lives could be in question, still starts misgivings in individuals. It brings up issues about whether the task mentioned above ought to be assigned to human staff. This healthcare system will help hospitals to provide healthcare support online 24 x 7, it answers deep as well as general questions. It also helps to generate leads and automatically delivers the information of leads to sales. By asking the questions in series it helps patients by guiding what exactly he/she is looking for.

II.RELATED WORK

Flora Amato paper was based on the concept of the Deep machine learning and Artificial intelligence; it allows the application to interact with patient in a manner that doctor does. For creating such powerful application researcher has used Watson conversation service which is designed and trained by the Blue mix platform.

PriyasankariM proposed an idea in which it uses user dialogue. User dialogue is a linear design that proceeds from symptom extraction to symptom mapping, where it defines the corresponding symptom then diagnosis the patient where it's a major or minor disease.

HameedullahKazi describes the development of a Healthcare assisting system for medical students, that is based on the open source AIML based Chatterbean. The AIML based Healthcare assisting system is customized to convert natural language queries into relevant SQL queries. A total of 97 question samples were collected and then those questions were divided into categories depending on the type of question. Based on the number of questions in each category the resultant categories were ranked. Questions were based on queries, where 47% are of posed questions.

Saurav Kumar Mishra says that the Healthcare assisting system will act as a virtual doctor and makes possible for the patient to interact with virtual doctor. Natural language processing and pattern matching algorithm for the development of this Healthcare assisting system. It is developed using the python Language. Based on the survey given it is found that the no of correct answer given by the Healthcare assisting system is 80% and incorrect/ambiguous answer given is 20%. From this survey of Healthcare assisting system and analysis of result suggested that this software can be used for teaching and as a virtual doctor for awareness and primary care.

III.PROPOSED ALGORITHM

A. *Design Considerations:*

- Importing the diseases and hospital data base in to the python script
- Developing the python script to ask random health symptom questions to the user
- Sending the question and answer to the decision tree classifier
- Final health problem prediction and doctor consulting suggestion result is displayed.

B. *Description of the Proposed Algorithm:*

Importing the dataset:
The dataset is being imported by using pandas library. The pandas library can actually handle most of the file types including csv file.

- Fetching the input symptoms as a string from the user andsends the data for processing.

- Performing logistic regression and Decision tree classifier to evaluate the symptoms and predict the diseases

- Displaying the respective diseases for the symptoms and assigning the best doctor for the specific diseases
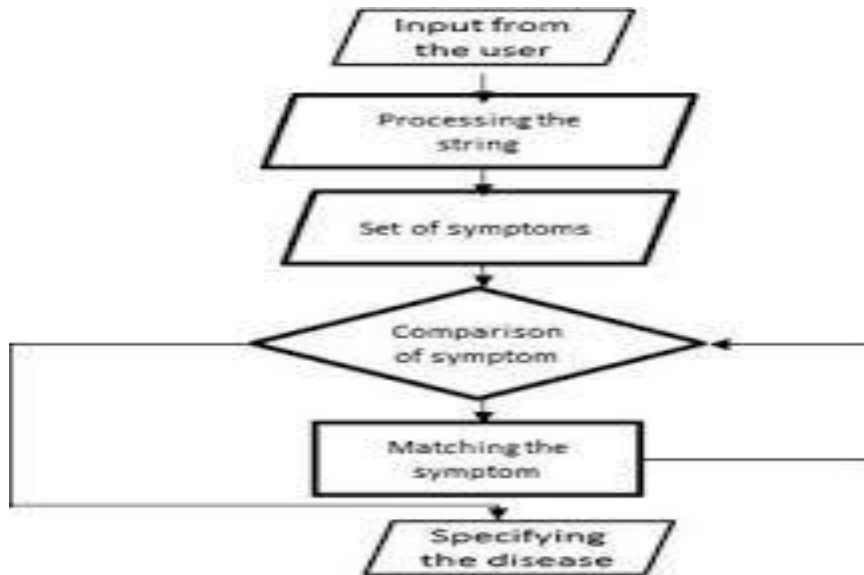
Figure:1.Flow diagram of the system

Logistic Regression:

Logistic regression is a technique that can be used for traditional statistics.
Logistic regression is similar to linear regression.
Logistic Regression predicts whether something is TRUE or FALSE.
Logistic Regression is a method used to predict a dependent variable, given a set of independent variables, such that the dependent variable is categorical.

Dependent Variable(Y):
   The response binary variable holding values like 0 or 1, Yes or No, A, B, or C.

Independent Variable(X):
   The predictor variable used to predict the response variable.

Formula to predict the logistic regression model:
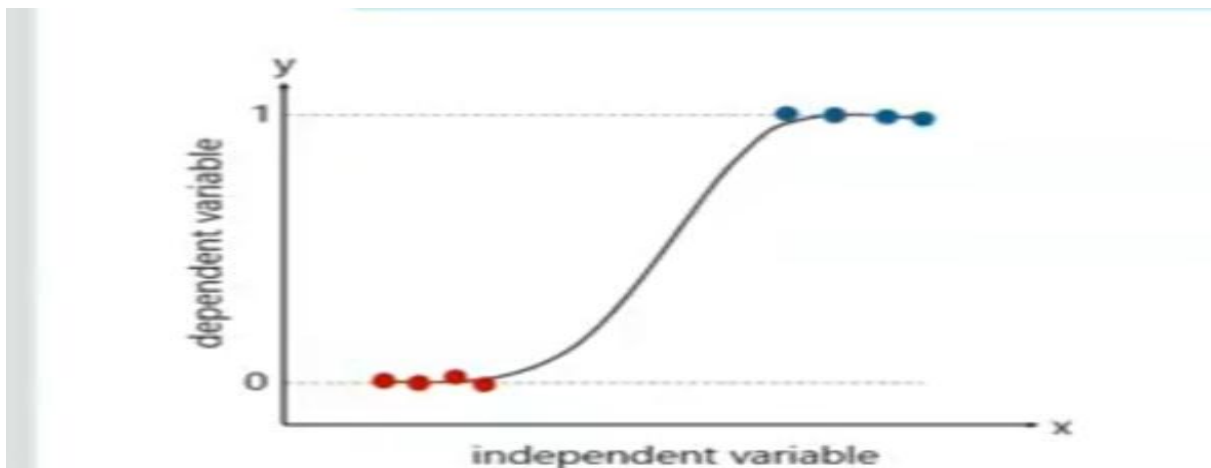$\log[y/1-y] = c+B1X1+B2X2+....$

Figure: 2.Simple Logistic Regression(S curve)

IV.METHODOLOGY

The Assisting System should be written in Python, GUI links and a simple, accessible network API. The system must provide a capacity for parallel operation and system design should not introduce scalability issues with regards to the number of surface computers, tablets or displays connected at any one time. The end system should also allow for seamless recovery, without data loss, from individual device failure.

There must be a strong audit chain with all system actions logged. While interfaces are worth noting that this system is likely to conform to what is available. With that in mind, the most adaptable and portable technologies should be used for the implementation. The system has criticality in so far as it is a live system. If the system is down, then customers must not notice, or notice that the system recovers quickly (seconds). The system must be reliable enough to run, crash and glitch free more or less indefinitely, or facilitate error recovery strong enough such that glitches are never revealed to its end-users.
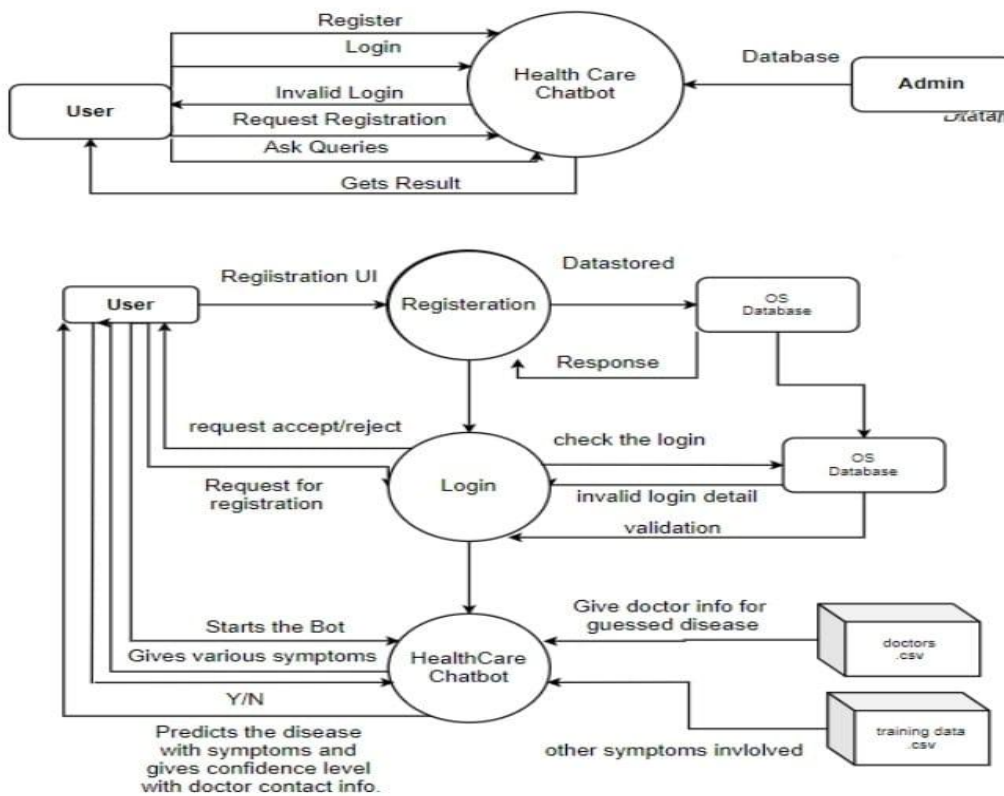

Figure:3.Architecture of the Healthcare Assisting System

V.PURPOSE AND SCOPE

Almost everyone kept on hold while operators connect you to a customer care executive. On an average people spend around 7 minutes until they are assigned to a person. Gone are the frustrating days of waiting in a queue for the next available operative. They are replacing live chat and other forms of slower contact methods such as emails and phone calls. Since health assisting system are basically virtual robots, they never get tired and continue to obey your command. They will continue to operate every day throughout the year without requiring to take a break.

VI. SIMULATION AND RESULTS

A healthcare Assisting system is developed for facilitating the objective data reception and transmission in a real-time manner to web server for further analysis. This system is a two-way communication system. This system provides the feedback in an interactive wayand physical activity on a daily basis in an easy and convenient way.
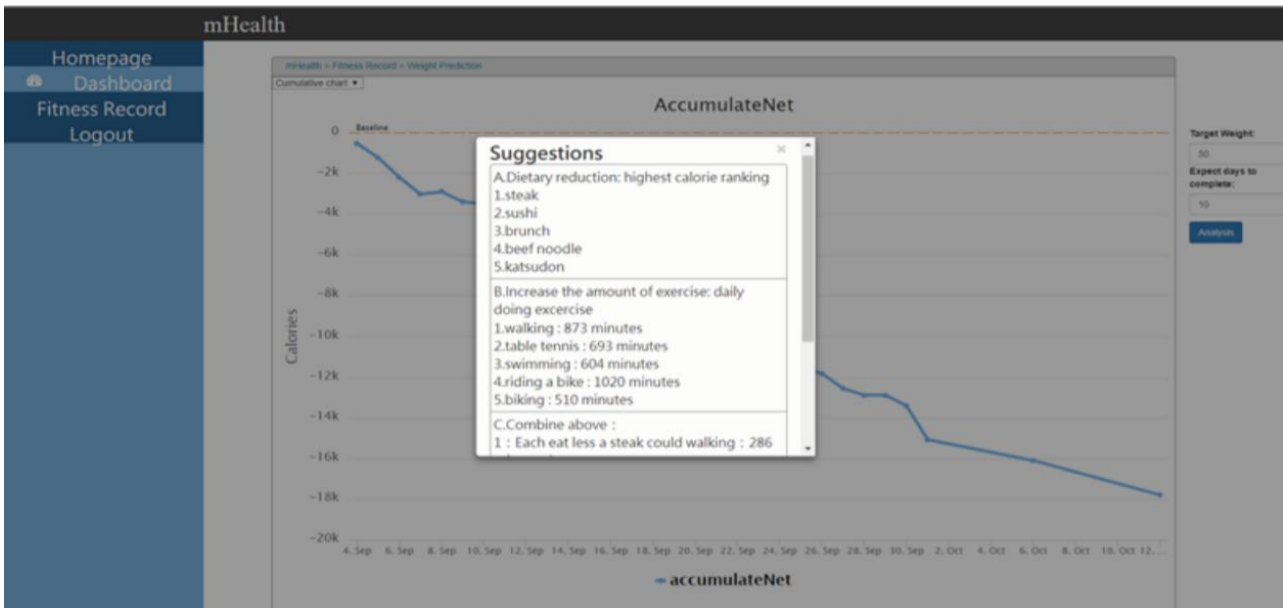

Figure:4. Screenshot of server operation, in terms of professional advice to user

VII. CONCLUSION AND FUTURE WORK

Thus, we can conclude that this system giving the accurate result. As we are using large dataset which will ensures the better performance. Thus, we build up a system which is useful for people to detect the disease by typing symptoms.

Health assisting system are a thing of the future which is yet to uncover its potential but with its rising popularity and craze among companies, they are bound to stay here for long. Machine learning has changed the way companies were communicating with their customers. With new platforms to build various types of health assisting system being introduced, it is of great excitement to witness the growth of a new domain in technology while surpassing the previous threshold.

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