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A SURVEY PAPER ON "MULTIPLE DISEASE PREDICTION USING MACHINE LEARNING"

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Abstract- **Now days most of the people are having lots of health related issues, due to lack of healthy food, proper sleep and daily exercise. So on-time analysis of any health related problem is important for the prevention and treatment of the illness. The traditional way of diagnosis is not sufficient for the treatment of serious disease. In this study we have developed a platform for the prediction of multiple diseases like heart, diabetes, Parkinson's disease. By which patient can predict multiple diseases on single platform. This disease prediction system uses Machine Learning algorithm named as Support vector machine, KNN, Confusion matrix.**

Keyword- **Machine Learning, Disease prediction, Heart Disease, Diabetes, Parkinson's disease, Support vector machine, KNN, Confusion Matrix.**

I. INTRODUCTION

Medicine and healthcare are some of the most important parts of the human life.When any patient is currently affected with an illness, they must see a doctor, which is both time consuming and expensive. It will be difficult to the patient if they are out of reach of doctors and hospitals because the illness. Because of that the patient cannot detect their illness. So, to reduce the money and to save the time we can make the automated software which can predict the disease according to the symptoms.

In this Medical field, data lot of data is generated on regular basis. Data in the Medical filed consists of all the information related to patients. Here architecture has been proposed for predicting the disease. Many of the existing models are predicting the one disease per analysis. Like one analysis for diabetes, one for heart analysis, one for Parkinson's diseases like that. There is no common system is developed that can analyse more than one disease at a time. Thus, we are concentrating on providing system where patent can do the accurate disease predictions according to the symptoms they enter.

In this system, we are going to predict Diabetes, Heart, and Parkinson's disease. Later we can add many more diseases. To implement multiple disease prediction systems we are going to use machine learning algorithms such as SVM, KNN, and Confusion matrix. Django and Python pickling is used to save the behaviour of the model. In this prediction system all the parameters which are important for the predicting the disease are included so it possible to predict the disease efficiently and more accurately.

II. LITERATURE REVIEW

According to the paper, this paper focuses about as diabetes is one of the dangerous diseases in the world. Diabetes can cause many varieties of disorders which includes blindness etc. In this paper author has used machine learning algorithms to find out diabetes disease. Their aim was to invent a system that can help the patient to detect the diabetes disease. In their study they used mainly 4 main algorithms Decision Tree, Naïve Bayes, and SVM algorithms. [1]

Heart plays an very important role in Humans. So the prediction of heart related disease should be perfect and accurate because it is very crucial part of humans which can cause death. So in this paper they have explained accuracy of machine learning algorithms for predicting heart disease. In this study author has used k-nearest neighbor, decision tree, linear regression and SVM. [2].

Various works has done earlier to predict the Parkinson's disease using different machine learning algorithms where the accuracy was differing depend on the different algorithms.

According to this paper, the Parkinson's disease is one of the serious diseases which happened to the older peoples. Early detection of the disease is very important. In this paper author has used different machine learning algorithms to predict the disease. Their aim was to build the Parkinson's disease prediction system which can help to the older people.

III. PROPOSED SYSTEM

In the proposed system, a multiple disease prediction system is built using a Machine Learning algorithm that is SVM, KNN, and Confusion Matrix. Based on the patient symptoms that are entered by the user the disease are predicted

In multiple disease prediction, there is possible to predict more than one disease at a time. So by which user doesn't need to go for multiple systems which will save the time and money.

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In this prediction system we have used heart disease, diabetes, Parkinson's disease.

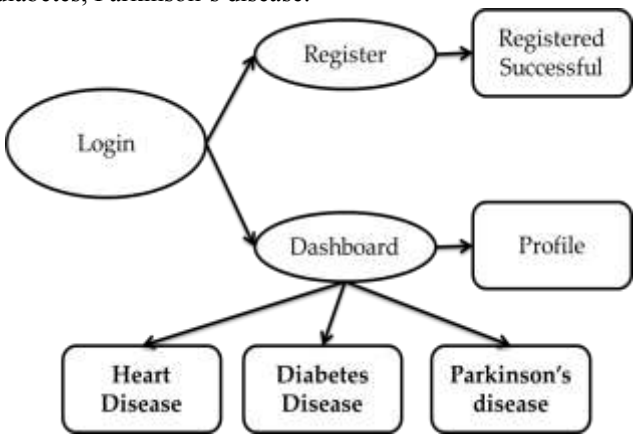

Fig. 1 Dashboard of Prediction System

Fig. 1 shows the architecture for the dashboard of multiple disease prediction system. Where the user has to login himself to the system. After that user will redirected to the dashboard of prediction system.

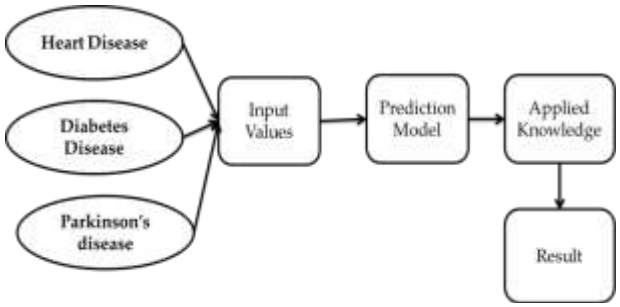

Fig. 2 Block Diagram

In Fig. 2 we have explained the architecture of multiple disease prediction system. In which we have selected the three disease Heart Disease, Diabetes Disease, Parkinson's disease.
The step for system is selecting the Disease. After selecting the disease user will enter the symptoms of that disease, then the entered values will go through the prediction model. In the prediction model different machine learning algorithms are applied.

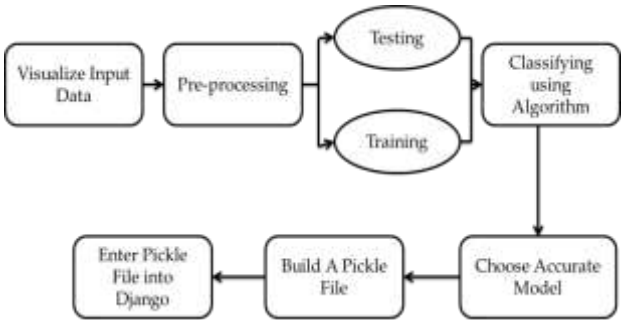

Fig. 3 Block Diagram of Prediction Model

In Fig. 3 we have explained block diagram for prediction model. In the prediction model different machine learning algorithm are used to predict the disease. In this project we have used the Support vector machine algorithm, KNN algorithm, Confusion matrix algorithm.
The first step in the prediction model is visualizing the data. After visualizing the data has been pre-processed. After completing data pre-processing the data is split in to two parts training and testing data. In next step algorithms are applied which will find the accurate result for the disease. Then we will create a pickle file for all the disease to store the output. After building the pickle file we integrated the pickle file with the django framework for getting output of the model on the webpage.

IV. IMPLEMENTATION

1.1 Support Vector Machine (SVM)

Support vector machine is most popular machine learning algorithms. SVM is a supervised learning algorithm which is used for classification as well as Regression problems.
The support vector machine algorithm is used to create the best line or the decision boundary between that can segregate n-dimensional spaces into classes so that we can easily find the correct data point.

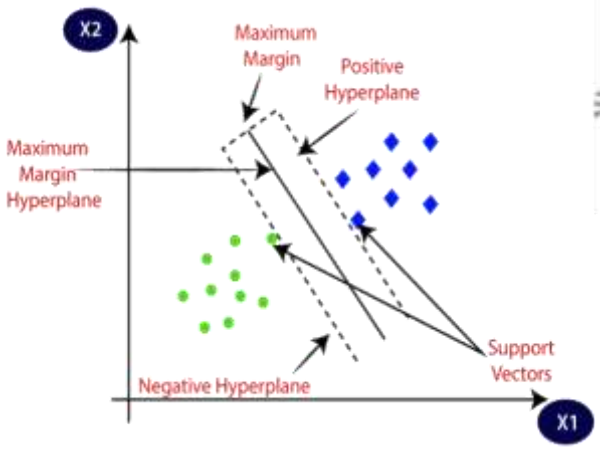

Fig. 4 SVM Graph

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1.2 K nearest Neighbor (KNN)

The K- nearest neighbour (KNN) algorithm is a type of supervised machine learning algorithm. KNN calculate the distance between the new data point to all other training data points. The calculated distance can be of Euclidean. After that it selects the K nearest data point, were the k can be any integer. At the end it assigns the data point to the class where the majority of k data point belongs.

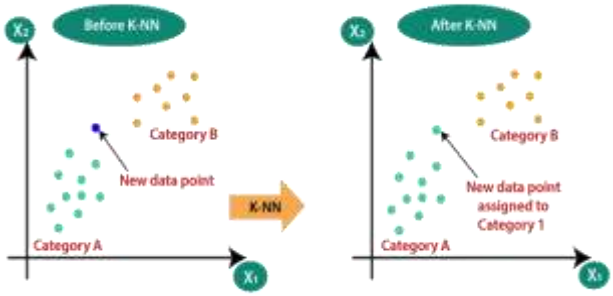

Fig. 5 KNN Graph

1.3 Confusion matrix

The confusion matrix is a type of matrix used to determine the performance of classification model the given set of data. Confusion matrix can determine the true values if the data set for test data is known. The confusion matrix is divided into two dimensions, as a predicted value and actual value along with total number of prediction.

n = total predictions	Actual: No	Actual: Yes
Predicted: No	True Negative	False Positive
Predicted: Yes	False Negative	True Positive

Fig. 6 Table of confusion matrix

V. CONCLUSION

Predicting the disease earlier can improve the human health. The aim of this project is to predict multiple diseases based on symptoms. The project is built in such a way that the system takes the patients symptoms as input and generates an output, which is nothing but the disease prediction.

This model can help to reduce the cost required in dealing with this disease and also help to improve the recovery process. By using this system patient can reduce the money required for treatment and can save the time.

VI. FUTURE SCOPE

In future we can add more disease in exiting prediction system. We can try to improve the accuracy of prediction of disease to reduce the morality. Also we can try to make the system more user friendly by adding new features.

VII. ACKNOWLEDGMENT

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