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ijircce@gmail.com



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Disease Prediction using Machine Learning

K. Rakesh¹, K. Harsha², N. Phalgun Sai³, K. Mallikarjuna⁴, Ms. B. Lakshmi Praveena⁵

UG Students, Dept. of I.T., Vasireddy Venkatadri Institute of Technology, Guntur, Andhra Pradesh, India^{1,2,3,4}

Assistant Professor, Dept. of I.T., Vasireddy Venkatadri Institute of Technology, Guntur, Andhra Pradesh, India⁵

ABSTRACT: Disease Prediction using Machine Learning is a system which predicts the disease based on the symptoms the user enters into the system and provides the accurate results based on that information. If the patient is not very serious and the user just wants to know the type of disease. Now a day's health industry plays major role in curing the diseases of the patients so this is also some kind of help for the health industry to tell the user and also it is useful for the user in case user doesn't want to go to the hospital, so just by entering the symptoms and all other useful information the user can get to know the disease user is suffering from and the health industry can also get benefit from this system by just asking the symptoms from the user and entering in the system and in just few seconds they can tell the exact and up to some extent the accurate diseases. This Disease Prediction Using Machine Learning is completely done with the help of Machine Learning and Python Programming language with Tkinter Interface for it and also using the dataset that is available previously by the hospitals using that we will predict the disease.

KEYWORDS: Machine Learning, Tkinter, Decision Tree algorithm, Random Forest algorithm, Naïve Bayes Algorithm.

I. INTRODUCTION

Disease Prediction using Machine Learning is a system which predicts the disease based on the information provided by the user. It also predicts the disease of the patient or the user based on the information or the symptoms he/she enters into the system and provides the accurate results based on that information. If the patient is not very serious and the user just wants to know the type of disease, he/she has been through. It is a system which provides the user the tips and tricks to maintain the health system of the user and it provides a way to find out the disease using this prediction. Now a day's health industry plays major role in curing the diseases of the patients so this is also some kind of help for the health industry to tell the user and also it is useful for the user in case he/she doesn't want to go to the hospital or any other clinics, so just by entering the symptoms and all other useful information the user can get to know the disease he/she is suffering from and the health industry can also benefit from this system by just asking the symptoms from the user and entering in the system and in just a few seconds they can tell the exact and up to some extent the accurate diseases. This DPUML is previously done by many other organizations but our intention is to make it different and beneficial for the users who are using this system. This Disease Prediction Using Machine Learning is completely done with the help of Machine Learning and Python Programming language with Tkinter Interface for it and also using the dataset that is available previously by the hospitals using that we will predict the disease. Nowadays doctors are adopting many scientific technologies and methodology for both identification and diagnosing not only common diseases, but also many fatal diseases. The successful treatment is always attributed to the right and accurate diagnosis. Doctors may sometimes fail to take accurate decisions while diagnosing the disease of a patient, therefore disease prediction systems which use machine learning algorithms assist in such cases to get accurate results. The project disease prediction using machine learning is developed to overcome general disease in earlier stages as we all know in competitive environment of The economic development of mankind has involved so much that users are not concerned about health. According to research there are 40% of people who ignore general disease which leads to harmful disease later. The main reason for ignorance is laziness to consult a doctor and time concerns. The people have involved themselves so much that they have no time to take an appointment and consult the doctor which later results in fatal disease. According to research there are 70% peoples in India suffers from general disease and 25% of peoples face death due to early ignorance the main motive to develop this project is that a user can sit at their convenient place and have a check-up of their health the UI is designed in such a simple way that everyone can easily operate on it and can have a check-up.

II. EXISTING SYSTEM

Prediction using traditional methods and models involves various risk factors and it consists of various measures of algorithms such as datasets, programs and much more to add on. High-risk and Low-risk patient classification is done on the basis of the tests that are done in group. But these models are only valuable in clinical situations and not in big industry sector. So, to include the disease predictions in various health related industries, we have used the concepts of machine learning and supervised learning methods to build the predictions system. After doing the research and comparison of all the algorithms and theorems of machine learning we have come to conclusion that all those algorithms such as Decision Tree, Naïve Bayes and Random Forest Algorithm all are important in building a disease prediction system which predicts the disease of the patients from which he/she is suffering from and to do this we have used some performance measures like ROC, KAPPA Statistics, RMSE, MEA and various other tools. After using various techniques such as neural networks to make predictions of the diseases and after doing that we come to conclusion that it can predicts up to 90% accuracy rate after doing the experimentation and verifying the results. The information of patient statistics, results, disease history in recorded in EHR, which enables to identify the potential data centric solution, which reduces the cost of medical case studies. Existing system can predict the disease but not the sub type of the disease and it fails to predict the condition of the people, the predictions of disease have been indefinite and non-specific.

III. PROPOSED SYSTEM

The proposed system of disease prediction using machine learning is that we have used many techniques and algorithms and all other various tools to build a system which predicts the disease of the patient using the symptoms and by taking those symptoms we are comparing with the system's dataset that is previously available. By taking those datasets and comparing with the patient's disease we will predict the accurate percentage disease of the patient. The dataset and symptoms go to the prediction model of the system where the data is pre-processed for the future references and then the feature selection is done by the user where he will enter the various symptoms. Then the classification of those data is done with the help of various algorithms and techniques such as Decision Tree, Naïve Bayes, Random Forest and etc. Then the data goes in the recommendation model, there it shows the risk analysis that is involved in the system and it also provides the probability estimation of the system such that it shows the various probability like how the system behaves when there are n number of predictions are done and it also does the recommendations for the patients from their final result and also from their symptoms like it can show what to use and what not to use from the given datasets and the final results. Here we have combined the overall structure and unstructured form of data for the overall risk analysis that is required for doing the prediction of the disease. Using the structured analysis, we can identify the chronic types of disease in a particular region and particular community. In unstructured analysis we select the features automatically with the help of algorithms and techniques. This system takes symptoms from the user and predicts the disease accordingly based on the symptoms that it takes and also from the previous datasets, it also helps in continuous evaluation of viral diseases, heart rate, blood pressure, sugar level and much more which is in the system and along with other external symptoms its predicts the appropriate and accurate disease.

IV. MODULES

The modules in disease prediction are:

1. User Module
2. Prediction Module

User Module:

A User Enters their details for registering themselves to the System. Input Details of Users such as username, email, phone, age, password. If the user's details are correct, the user is registered. If the user's details are incorrect, Displays an error message. If the user is already registered, Displays an error message.

When the user tries to log in, details of the user are verified in the system If the login details are correct, the user is logged in and the user page is displayed If the login details are incorrect, Displays an error message.

Prediction Module:

User needs to enter symptoms to get the prediction result. If the user enters all 5 correct symptoms then the accuracy will be high. If a user enters only a few symptoms then accuracy will be low. When user enters all the symptoms then he needs to press the buttons of respective algorithm, for example there are 3 buttons for 3 algorithms, if user enters all symptoms and presses only Random forest's button then the result will be provided only calculating using that algorithm, like this we have used 3 algorithms to provide more clear picture of the results and user needs to be satisfied with his predicted result.

V. WORKING

In this working we have different steps to follow they are:

- In this working of a system, first user need to register into the system in order to use the prediction.
- Next step is user need to login to the system using username and password.
- After logging in the user need to select symptoms from given drop down menu.
- For more accurate results user need to enter all the symptoms then the system provides accurate result.
- Finally system gives accurate disease based on user given symptoms.

VI. EXPERIMENTAL RESULTS AND ANALYSIS

In this system we worked on different test cases if the user details are correct, user is registered. If the user details are incorrect Displays error message. If the user is already registered displays error Message. If the user enters all 5 symptoms then accuracy will be high. If the user enters few symptoms then accuracy will be low.

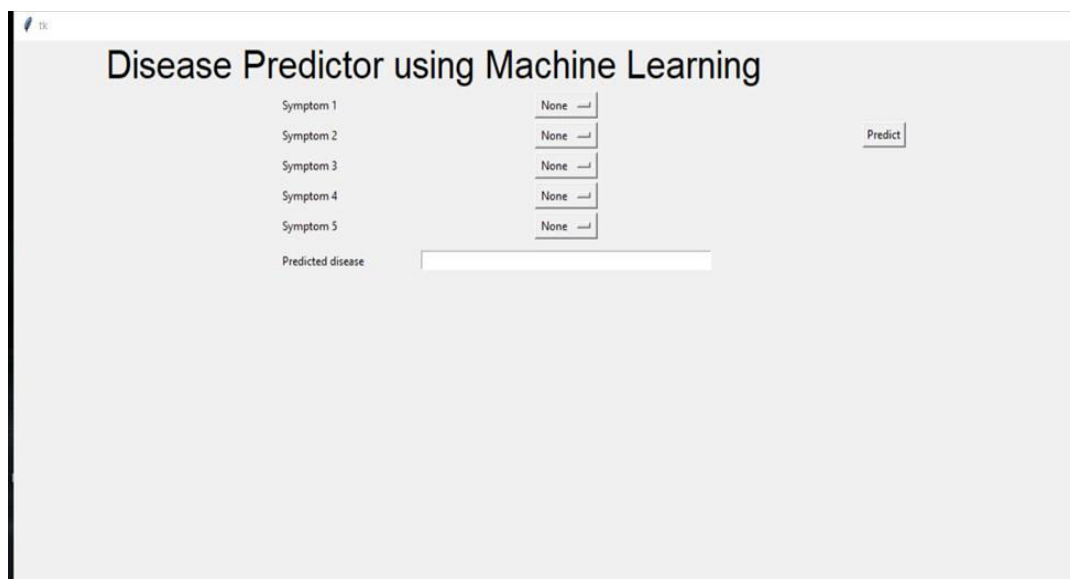
Here some of the different outcomes that we got by executing the system. they are:

SOME OF THE TEST CASES ARE GIVEN BELOW

Test case-1:

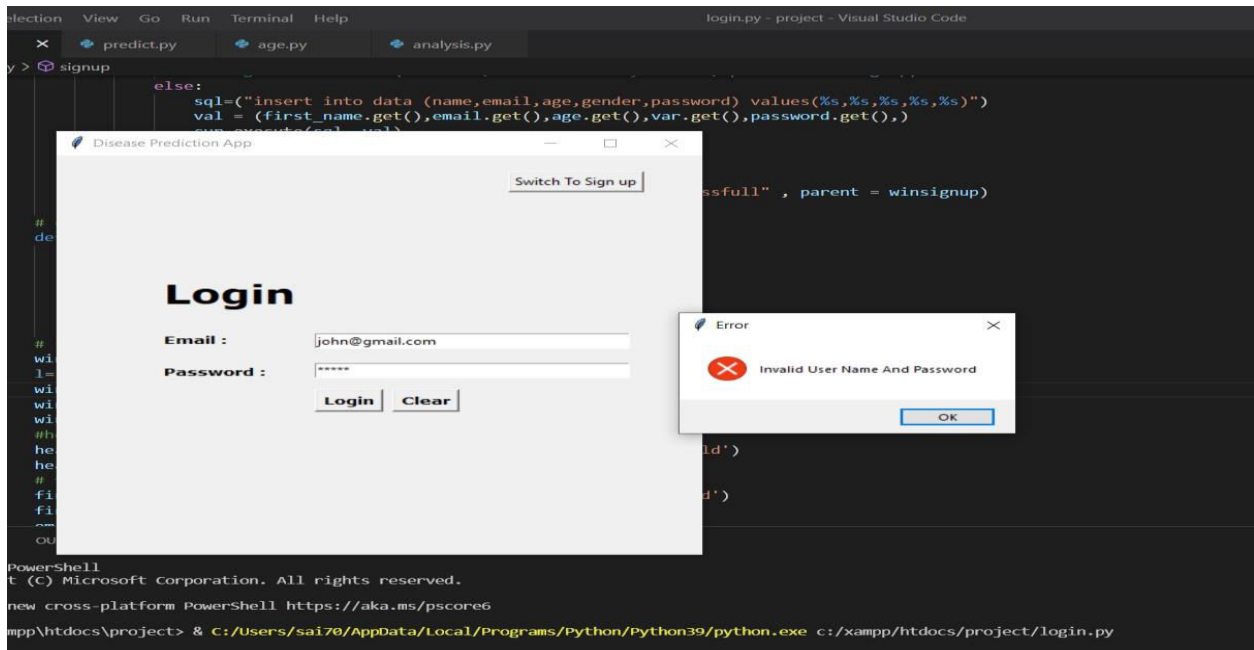
Case1: User login to the system using valid details.

After entering valid login details prediction page will be displayed.



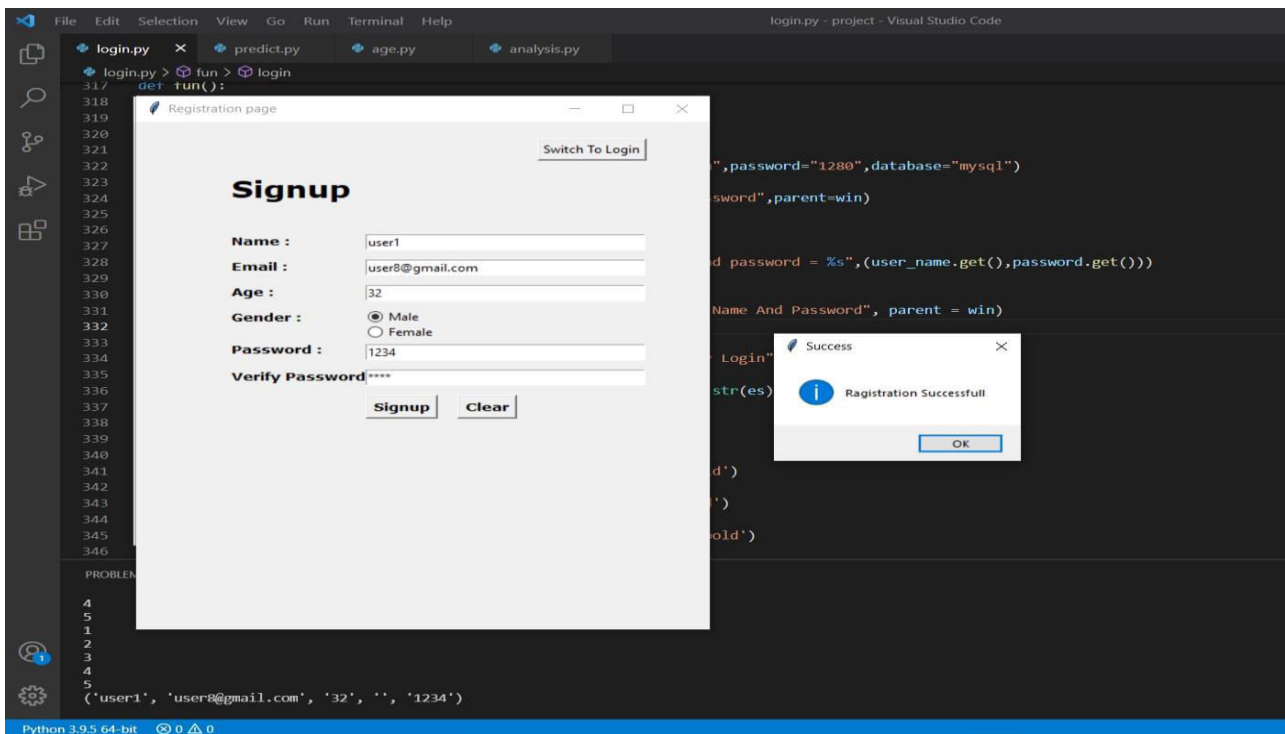
Case-2: User login to the system using invalid details

Error Message will be Displayed.



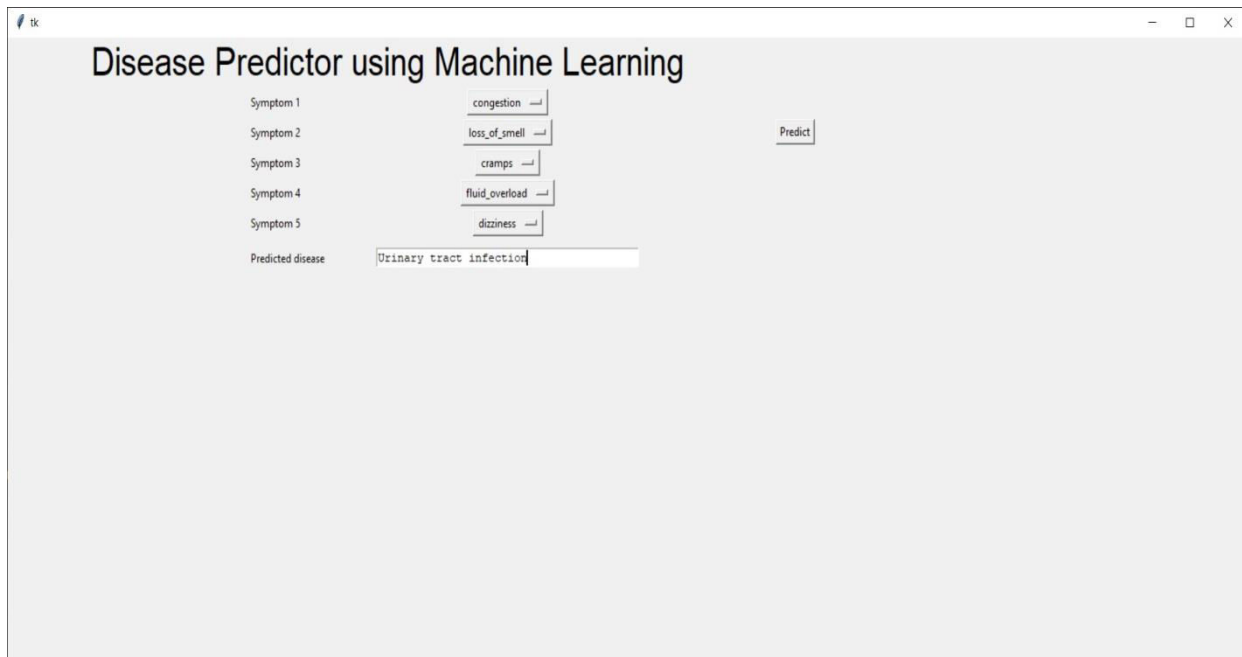
Case3: User registering into the system

Registration success message will be displayed.



Case4: Disease Prediction using symptoms given by the user as input.

Predicted disease will be displayed.



FUTURE WORK

- Facility for modifying user detail.
- More interactive user interface.
- Facilities for Backup creation.
- Can be done as Web page.
- Can be done as Mobile Application.
- More Details and Latest Diseases.

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