Prediction Of Chronic Kidney Disease Stages and Chronic Kidney Stones Using the SML Technique

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ABSTRACT: The phrase "chronic kidney disease" refers to kidney damage which is continuous for long timeand may get worse over time. The kidney does not function properly if the harm is severe. Thisis mentioned as End-Stage Renal disease or Kidney failure. Patients with kidney disease may enter the chronic phase which is characterized by a gradual decline in kidney function. For determining whether kidney disease is severe or not, we employ a variety of algorithm in this paper. By predicting the disease's stages, we are taking it further into consideration if it is severe. Additionally, we focused if a kidney stone will be present or not. In this paper, we alsoattempt to deploy the modules that we developed to find the appropriate accuracy of the disease.Here, we use Supervised Machine Learning Techniques to predict the accuracies.

INTRODUCTION

Using SML techniques, we choose the subject of knowledge set to improve detection of chronickidney disease and kidney stone. People are all aware about CKD which is one of the most common disease among individuals nowadays. By gathering a large amount of CKD and kidney stone data, we are working hard to improve the spotting of disease in people. It usuallyaffects the adults above the age of 30 and continues indefinitely. Males between age of thirty to thirty five have stage five CKD without a transplant, one could expect to live for fourteen years. Women of the same age affected with this disease are expected to live for thirteen years. Everybody has a four year life expectancy between the age of seventy to seventy five regardlessof the gender. GFR rate is popular tool in identifying the majority of renal disorders (Glomerular Filtration Rate). Maintaining a healthy lifestyle are crucial in the fight against kidney stone and CKD.

LITERATURE SURVEY

1. Chronic Kidney DiseaseAnd itsComplications.(2008)[Robert Thomas, MD, AbbasKans, MD,John R. Sedor, MD]

When aberrant albumin excretion or impaired kidney function last for longer than three months,as determined by a measured or estimated glomerular filtration rate (GFR), CKD is present.

PROS: According to the stage of the disease, treatments are suggested for CKD and dialysispatients. These treatments could lower these patients' morbidity and fatality rates.

CONS: Although it has not been determined for sure, it is prudent to abide by FDAinstructions.

2. Diagnosis of Chronic Kidney Disease Using Effective Classification Algorithms andRecursive Feature Elimination Techniques

The originality in this study is in creating a system for diagnosing chronic renal illnesses. This study helps specialists about studying preventive methods for CKD through early diagnosis utilising ML approaches. This paper's main ideology was to assess a dataset madeup of 400 patients and 24 attributes. The missing nominal and numerical data were replacedusing the mean and mode statistical analysis methods. RFE helps to select the most crucial characteristics.

PROS: Our systems' accuracy ranged from 100% with random forest to 97.3% with SVM.

CONS: These papers don't accurately depict chronic renal disease.

3. Prediction of Chronic Kidney Disease – A Machine Learning Perspective :

This article inspect CKD prediction in a different manner. In this paper, seven classifiermethods were used. The results have been calculated for each classifier based on the particular criterion features.

PROS: The linear support vector machine provided the maximum accuracy of 98.46%.

CONS: Logistic and KNN were not employed in SMOTE since they did not produce thedesired results.

3. EXISTING SYSTEM

For the clinical diagnosis of kidney disease stages and stone formation , an accurate testing ofGlomerular filtration rate (GFR) is essential. Computer learning methodologies such as deep neural networks offer a viable way for improving GFR estimation accuracy. In order to find GFR, they created a unique architecture called a deep and shallow neural network(dlGFR). Wethen compared its working to that of estimated GFR derived from the MDRD and CKD-EPI equations for stages and kidney stone epidemiology.

4. PROPOSED SYSTEM

The proposed ideology is to create a ML model for categorizing renal disorder stages and kidney stones. The procedure begins with data collection, in which past information about kidney disease stages and stones is collected. With the help of attributes, we implement different algorithms and try to find the best accuracy between them. The one that produces thebest accuracy is promoted to provide the output to the user

5. SCOPE OF THE PROJECT:

The goal of the research is to use ML methods for studying a dataset collected from a hospitalwebsite for determining whether a patient has CKD or not and has any kidney stones as soon as feasible.

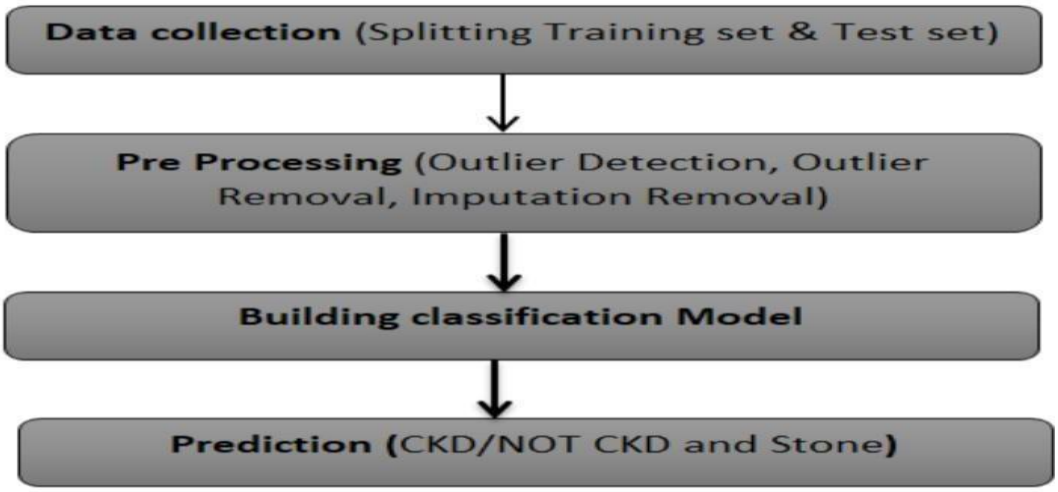
6. LIST OF MODULES:

1. Data pre-processing
2. Data visualization
3. Implementing Algorithms

a. Logistic Regression
b. KNN
c. Decision Tree Classifier
d. Naïve bayes

4. Deployment

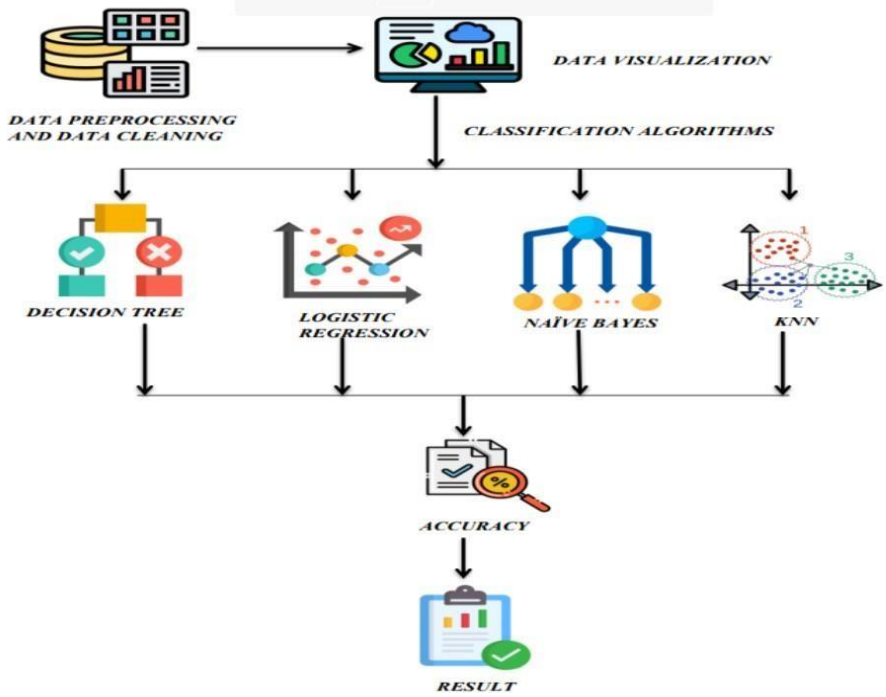
7. WORKING



WORKING DESCRIPTION:

According to the blood test report, the values for each attributes will be entered in the website which we have given. Then the User will click the "PREDICT" button . After then the process will be carried out in the backend to produce the results according to the data which the user entered. In that the first process will be "DATA PREPROCESSING". After Data Preprocessing, Data visualization will be performed for better understanding of the data. After Data visualization, We are separating the dataset into training dataset and testing dataset. The output of the training dataset will be classification of ML algorithms.So with ML algorithms, we would test the dataset for the accuracies of different algorithms. After the accuracy report of each algorithms, we consider the best accuracy algorithm to find the stages and kidney stone according to the values entered by the user. For finding the stages and kidney stones, the average of attributes values are considered to predict the result as such like Class 0 ,Class 1 ,Class 2.

SYSTEM ARCHITECTURE:



9. RESULT:

In this project we tried to find the CKD disease's presence and the kidney stone presence.In this project we achieved accuracy of 97.9%.

FUTURE ENHANCEMENT:

1. Hospitals aspire to automate (in real time) the process of excluding diseased people fromeligibility.
2. To automate this process by displaying the results in websites
3. To simplify the tasks that must be completed in an AI environment.

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