

Chronic kidney disease prediction using Watson Auto AI

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1 INTRODUCTION

1.1 OVERVIEW

This is an ambitious, student-led, initiative to plan, design and build a model which provides an efficient and faster way to predict whether the patient is suffering from the major kidney problem known as CHRONIC-KIDNEY DISEASE.

This document is focused on Machine Learning Model to identify patients with Chronic Kidney Disease(CKD).Chronic Kidney Disease (CKD)is a major medical problem and can be cured if treated in the early stages. Our aim is to predict patients with chronic kidney failure (ckd) disease and patients who do not (notckd) suffer from the disease.

1.2 PURPOSE

The attributes collected from various medical tests are used here to measure the severity of the problem. The attributes may include the person's age factor, red blood cells count, hemoglobinlevel, blood pressure, etc. In this prediction model, we feed those values of attributes collected as input.

And this trained model would deliver the feedback whether the patient is suspected tohave the disease or not. this method would be helpful for predicting if a person is having disease or not at early stages itself.

2.LITERATURE SURVEY

2.1 EXISTING PROBLEM

Healthcare professionals are able to infer the acuity and severity of a case without superfluous or redundant documentation, but auditors may not have this ability. Adequate documentation for every service date helps to convey patient complexity during a medical record review.

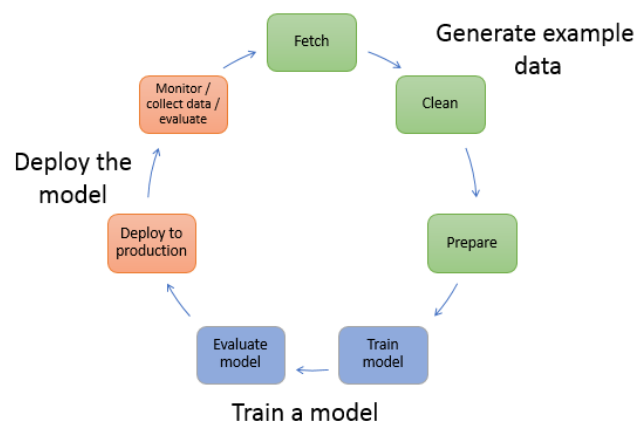
Chronic Kidney Disease (CKD) is a major medical problem and can be cured if treated it in the early stages. Usually, people are not aware that medical tests, we take for different purposes could contain valuable information concerning kidney diseases.

2.2 PROPOSED SOLUTION

Using the model trained on training dataset, it would be more helpful in quick diagnosing patients condition based on the easily available features like hemoglobin content, age, wbc and rbc contents. The necessary data can be collected and the values can be documented. Those values can be fed to this model as input and with the output predicted, we can conclude the severity or status of the patient, that he/she should undergo hemodialysis or renal transplantation or peritoneal dialysis or continue with meds or cured.

3.EXPERIMENTAL ANALYSIS

3.1 BLOCK DIAGRAM



3.2 SOFTWARE DESIGNING

STEPS INVOLVED IN BUILDING THIS MODEL:

- Download the dataset kidney_disease.csv from kaggle.
- Preprocess the dataset to get required feature sets in this case I have taken sg, al, sc, hemo, pcv and htn feature columns.
- Create an IBM watson studio service in cloud.ibm.com
- Create a machine learning service instance.
- Create a new project and create an auto AI Environment.
- Import the dataset kidney_disease.csv
- Build the model by training and select the most accurate model and save the model.
- deploy the selected model and test it with custom inputs.

FOR DEPLOYMENT OF THE MODEL:

- Create a new Node-red app service for creating a UI for th model.
- By creating required templates and customize it.
- And deploy the UI and test it.

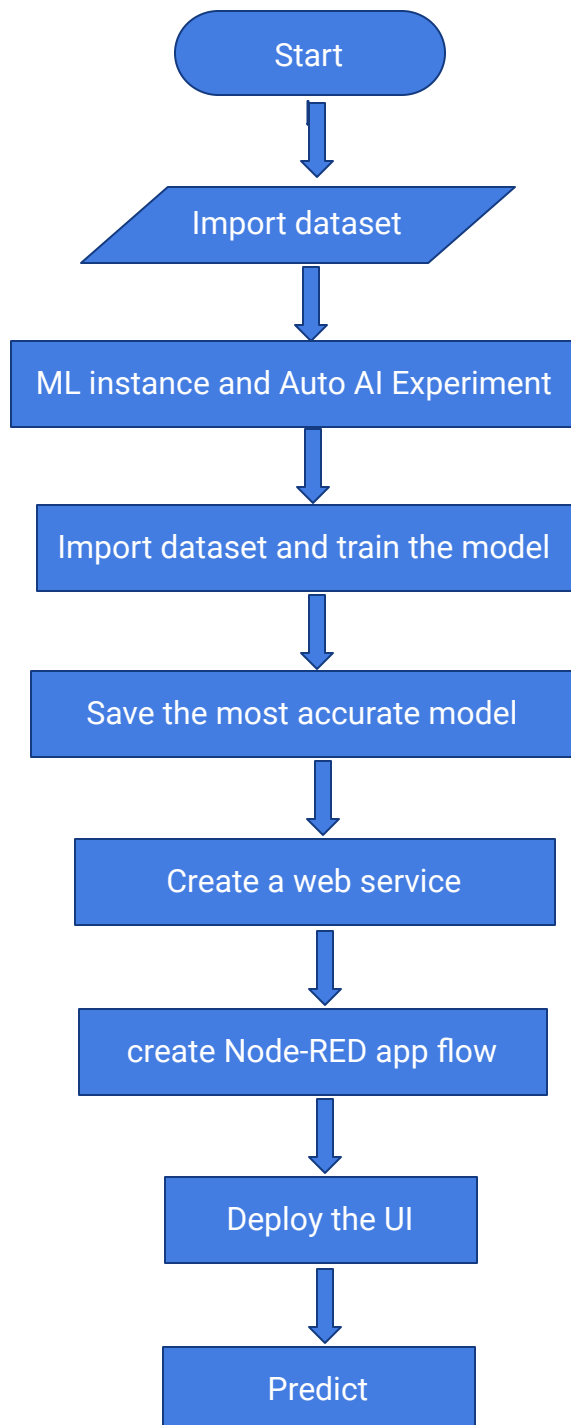
4.EXPERIMENTAL INVESTIGATION

This model takes information of various medical test predictions of patient and identify whether patient have chronic kidney disease or not.

Model takes information of 6 test reports such as sg, al, sc, hemo, pcv and htn and predict the result of patient as ckd or not ckd.

The information says that it helps us to measure the severity of the problem, the predicted survival of the patient after the illness, the pattern of the disease and work for curing the disease.

5.FLOW CHART



6.RESULT

Model is built using IBM Watson Auto AI Machine Learning Service. The model is deployed on IBM cloud to get scoring end point which can be used as API in mobile app or web app building. A web application is built using Node Red Service. Used the scoring end point to give user input values to the deployed model. Finally, the result is obtained as ckd or notckd which gives information whether the patient is suffering from chronic kidney failure or not. So, that further measures can be taken.

The screenshot shows a web browser window with multiple tabs. The active tab is titled 'Node-RED Dashboard' and shows a URL: 'node-red-rybs.eu-gb.mybluemix.net/ui/#/0?socketid=SY0XQhnlF6lTGdAAAD'. The page has a blue header with the word 'Home'. The main content area is light gray and contains a form titled 'Default'. The form has two columns: 'classification' and 'notckd'. Under 'classification', there are input fields for 'ig' (value 1.025), 'a1' (value 1), 'a2' (value 1.2), 'hemo' (value 15.4), 'pov' (value 44), 'hct' (value 44), and 'hgb' (value 15.4). Below these fields are two buttons: 'SUBMIT' and 'CANCEL'. At the bottom of the browser window, there is a dark gray bar with a 'flows.json' icon and a 'Show all' button.

7.ADVANTAGES

1. Faster and Reliable.
2. Efficient output with maximum accuracy.
3. Predicts with certainty.
4. Simpler concept.
5. Can perform even with large number of suspects.
6. Lesser perplexity.
7. Earlier deduction reduces high risks.
8. Can prevent loss of data.
9. It is a proposal for best prediction framework for CKD.

DISADVANTAGES

1. Requires server which processes heavy loads.
2. Requires stable network connection.
3. May lead to overfitting.
4. The model should be trained properly with a balance between CKD and not CKD values, else there may be chances of predictions with depreciated accuracy.

8.APPLICATIONS

Machine Learning is a buzzword for today's technology and it is growing rapidly day by day. We are using Machine Learning in many ways for our daily lives. This aids greatly for simplifying our day to day tasks by using one of its efficient algorithms. Likewise various real time applications are

- Medical diagnosis.
- Stock market Trading.
- Educational Institutions
- Online Fraud Detections etc.

This model can be efficiently used in Healthcare Systems such as Diagnosis which aids in rapid growth of medical technology. This model identifies positive and negative cases of CKD which helps in early detection of the disease and reduces risks. Also predicts with certainty.

9.CONCLUSION

I would like to conclude that, it is immense learning experience while preparing the project. Model is built using IBM Watson Auto AI Machine Learning Service. The model is deployed on IBM cloud to get scoring end point which can be used as API in mobile app or web app building. A web application is built using Node Red Service. Used the scoring end point to give user input values to the deployed model. The of this model is to find whether the patient is affected by chronic kidney disease or not by taking the information of various tests. . Finally, the result is obtained as ckd or notckd which gives information whether the patient is suffering from chronic kidney failure or not. So, that further measures can be taken.

10.FUTURE SCOPE

This work will be considered as basement for the healthcare system for CKD patients. Also, extension to this work is the implementation of deep learning since deep learning provides high-quality performance than machine learning algorithm.

11.BIBILOGRAPHY

The content for this project report is taken from the following sources:

- <https://smartbridge.teachable.com/>
- <https://cloud.ibm.com/>
- <https://www.kaggle.com/mansoordaku/ckdisease>
- <https://cloud.ibm.com/catalog?search=object#services>