TITLE: Predict heart failure using IBM auto Ai Service

1 INTRODUCTION

1.1 Overview

Due to hectic work schedules and stress heart failure is a common in almost all age people. Despite various advance technologies are used for diagnosis and treatment the outcomes with heart failure in patients remain high. Hence, understanding expected risks and communicating to patients and their families constitutes important aspects of patient-physician interactions in heart failure. It would also could help reduce low-risk patient anxiety and avoid costly interventions.

1.2 Purpose

Heart Failure Prediction provides information about risk of heart failure in patient so the type and intensity of care can be provided.

2 LITERATURE SURVEY

2.1 Existing problem

There are numerous heart failure prediction models that has been published to statistically predict the risk of heart failure. Despite these models, people and clinicians are reluctant to adopt them in daily practice due to their reliability and the complexity of statistical methodologies[1Risk prediction models are more likely useful for informing healthcare systems to look for at-risk patients and follow-up to improve outcomes. A number of authors have reviewed available risk prediction models, in an attempt to guide and inform healthcare providers and payers of their relative merits [1–5]. For example, Rahimi et al. concluded that several of the models were well-validated and had clinical value, but also that models varied, particularly with regards to their statistical approach, sample size, population characteristics, and parameters employed for model development [12]. As such, no one model could be clearly recommended.

2.2 Proposed solution

Through systematic literature review it was observed that by using appropriate statistical model and platform there is still scope of improvement in heart failure Prediction Model. The aim of the project is to overcome the flaws by using appropriate tool to get the best result. So IBM auto ai service is used to understand the methodological development and used appropriate statistical model and deploy on website.

3 THEORITICAL ANALYSIS

An Heart failure prediction model is developed using using. The data set is imported fromgithub.com/IBM/predictive-model-on-watson-l/blob/master/data/patientdataV6.csv. different algorithms are applied by IBM machine learning environment to get best appropriate algorithm. Gradient Boosting Classifier Estimator scored highest score, So Gradient Boosting Classifier is used for further deployed for prediction. Gradient boosting is a machine learning technique for regression and classification problems, which produces a prediction model in the form of an ensemble of weak prediction models, typically decision trees. It builds the model in a stage-wise fashion like other boosting methods do, and it generalizes them by allowing optimization of an arbitrary differentiable loss function.

3.1 Block diagram

The proposed system will add some more parameters significant to heart attack with their weight, age and the priority levels are by consulting expertise doctors and the medical experts. The heart attack prediction system designed to help the identify Heart Failure
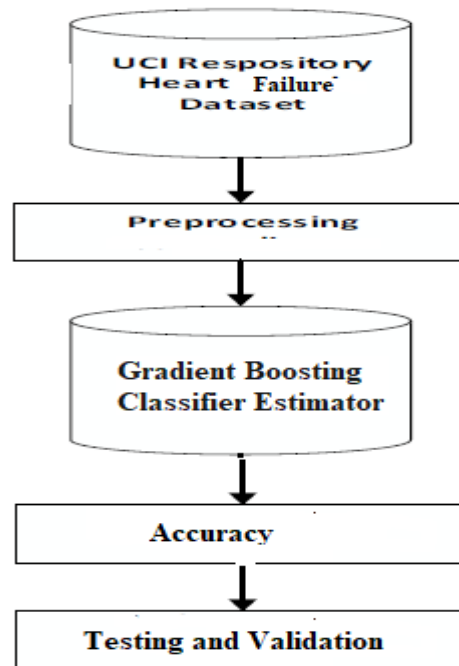
3.2 Hardware / Software designing

Software requirements:

1. IBM Watson API
2. Node-RED
3. IBM Watson Machine learning
4. IBM Watson Cloud storage
5. Github Versioning Control

Hardware Requirement:

1. Processor: Intel or high
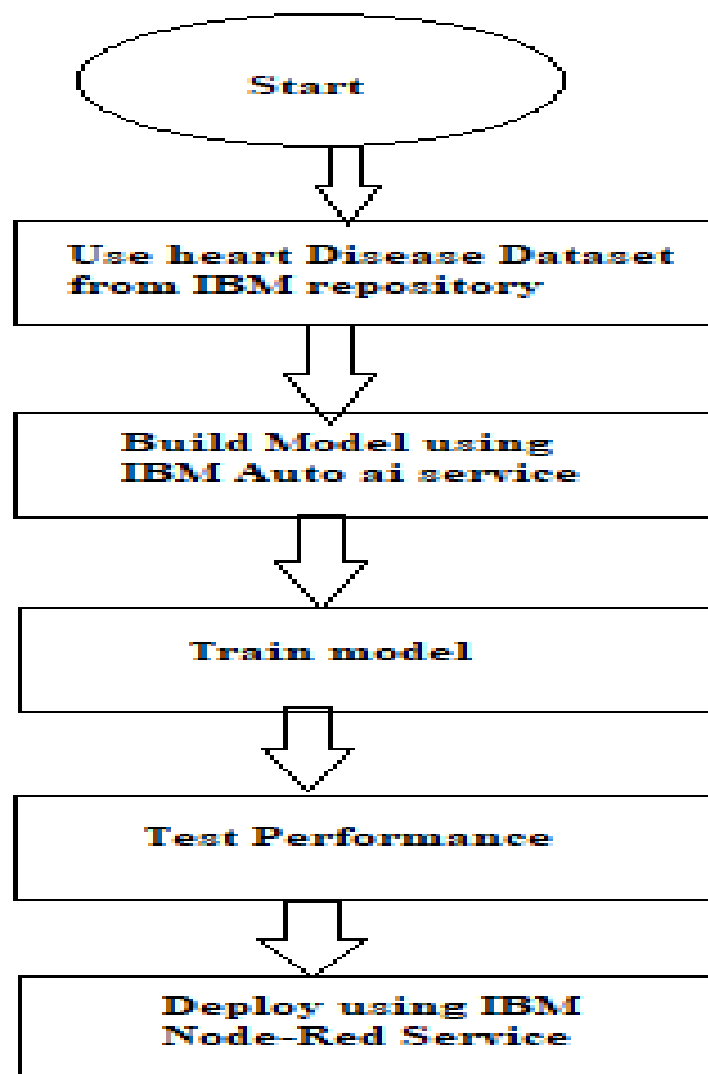2. RAM: 1024 MB
3. Space on disk: minimum 100mb
4. Network Wi-Fi Internet or cellular Network

5 EXPERIMENTAL INVESTIGATIONS

The health care industries collect huge amounts of data that contain some hidden information, which is useful for making effective decisions. For providing appropriate results and making effective decisions on data, some advanced data mining techniques are

used. In this study, a Heart Failure prediction System is developed using Gradient Boosting Classifier Estimator algorithms for predicting the risk level of heart disease. The system uses 6 medical parameters such as age, sex, avgheartbeatpermin, palpitationsperday, cholesterol, and BMI for Heart Failure prediction. The model predicts the likelihood of patients getting heart failure. It enables significant knowledge. E.g. Relationships between medical factors related to heart disease and patterns, to be established. The obtained results have illustrated that the designed diagnostic system can effectively predict the risk of heart failure.

5 FLOW CHART

```
        ┌─────────────┐
        │    Start    │
        └─────────────┘
               │
               ▼
    ┌───────────────────────────┐
    │ Use heart Disease Dataset  │
    │   from IBM repository      │
    └───────────────────────────┘
               │
               ▼
    ┌───────────────────────────┐
    │    Build Model using       │
    │    IBM Auto ai service      │
    └───────────────────────────┘
               │
               ▼
    ┌───────────────────────────┐
    │       Train model          │
    └───────────────────────────┘
               │
               ▼
    ┌───────────────────────────┐
    │     Test Performance       │
    └───────────────────────────┘
               │
               ▼
    ┌───────────────────────────┐
    │    Deploy using IBM        │
    │    Node-Red Service        │
    └───────────────────────────┘
```

6 RESULT

7 ADVANTAGES & DISADVANTAGES

Advantages

1. General physicians can utilize this tool for initial diagnosis of cardio-patients
2. Help in reducing treatment costs by providing Initial diagnostics in time
3. Provides clinical decision support with computer-based patient records (Data Sets).
4. Reduce medical errors, enhance patient safety, decrease unwanted practice variation, and improve patient outcome

Disadvantages

1. More accurate result should be provided to avoid misleading to patients

8 APPLICATION

1. General physicians can utilize this tool for initial diagnosis of cardio-patients
2. Help in reducing treatment costs by providing Initial diagnostics in time

3. Provides clinical decision support with computer-based patient records (Data Sets).

4. Reduce medical errors, enhance patient safety, decrease unwanted practice variation, and improve patient outcome

9 CONCLUSIONS

The proposed working model can also help in reducing treatment costs by providing Initial diagnostics in time. The model can also serve the purpose of training tool for medical students and will be a soft diagnostic tool available for physician and cardiologist. General physicians can utilize this tool for initial diagnosis of cardio-patients. There are many possible improvements that could be explored to improve the scalability and accuracy of this prediction system. As we have developed a generalized system.

10 FUTURE SCOPE

In future we can use this system for the analysis of different data sets. The performance of the health's failure diagnosis can be improved significantly by handling numerous class labels in the prediction process, and it can be another positive direction of research.

11 BIBILOGRAPHY

[1] Canepa M, Fonseca C, Chioncel O, Laroche C, Crespo-Leiro MG, Coats AJS, et al. Performance of Prognostic Risk Scores in Chronic Heart Failure Patients Enrolled in the European Society of Cardiology Heart Failure Long-Term Registry. JACC Heart Fail. 2018;6(6):452–62. Epub 2018/06/02. pmid:29852929

[2]Rahimi K, Bennett D, Conrad N, Williams TM, Basu J, Dwight J, et al. Risk prediction in patients with heart failure: a systematic review and analysis. JACC Heart Fail. 2014;2(5):440–6. Epub 2014/09/10. pmid:25194291

[3] Alba AC, Agoritsas T, Jankowski M, Courvoisier D, Walter SD, Guyatt GH, et al. Risk prediction models for mortality in ambulatory patients with heart failure: a systematic

[4].Ouwerkerk W, Voors AA, Zwinderman AH. Factors Influencing the Predictive Power of Models for Predicting Mortality and/or Heart Failure Hospitalization in Patients With Heart Failure. JACC Heart Fail. 2014;2(5):429–36. pmid:25194294

[5]Wessler BS, Lai Yh L, Kramer W, Cangelosi M, Raman G, Lutz JS, et al. Clinical Prediction Models for Cardiovascular Disease: Tufts Predictive Analytics and Comparative Effectiveness Clinical Prediction Model Database. Circ Cardiovasc Qual Outcomes. 2015;8(4):368–75. Epub 2015/07/15. pmid:26152680; PubMed Central PMCID: PMC4512876.