EFFECTIVE HEART DISEASE PREDICTION USING IBM AUTO AI SERVICE

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CHAPTER 1 – INTRODUCTION

1.1. Overview

Heart disease is one of the most fatal problems in the whole world, which cannot be seen with a naked eye and comes instantly when its limitations are reached. Therefore, it needs accurate diagnosis at accurate time. Health care industry produced huge amount of data every day related to patients and diseases. However, this data is not used efficiently by the researchers and practitioners. Today healthcare industry is rich in data however poor in knowledge. There are various data mining and machine learning techniques and tools available to extract effective knowledge from databases and to use this knowledge for more accurate diagnosis and decision making. In this report, the NODE Red machine learning services in cloud.ibm.com provide the various machine learning types for different dataset.

1.2. Purpose

The main purpose of this project in IBM Cloud is to create a web application without using the python code. In this project, the machine learning model services are used to import the dataset directly and practiced with various models. The performance metrics were considered automatically along with execution time.This reduces the elapsed time for performing the comparative analysis .Finally; NODE Red plays an important role to create the web application.

CHAPTER 2 – LITERATURE SURVEY

There is number of works has been done related to disease prediction systems using Different algorithms in medical Centres.

V.V. Ramalingam et.al., informed that the Heart related diseases or Cardiovascular Diseases (CVDs) are the main reason for a huge number of death in the world over the last few decades and has emerged as the most life-threatening disease, not only in India but in the whole world. So, there is a need of reliable, accurate and feasible system to diagnose such diseases in time for proper treatment. Machine Learning algorithms and techniques have been applied to various medical datasets to automate the analysis of large and complex data. Many researchers, in recent times, have been using several machine learning techniques to help the health care industry and the professionals in the diagnosis of heart related diseases. This paper presents a survey of various models based on such algorithms and techniques and analyzes their performance. Models based on supervised learning algorithms such as Support Vector Machines (SVM), K-Nearest Neighbour (KNN), NaïveBayes, Decision Trees (DT), Random Forest (RF) and ensemble models are found very popular among the researchers.

Jaymin Patel et.al., explained Heart disease is the main reason for death in the world over the last decade. Almost one person dies of Heart disease about every minute in the United States alone. Researchers have been using several data mining techniques to help health care professionals in the diagnosis of heart disease. However using data mining technique can reduce the number of test that are required. In order to reduce number of deaths from heart diseases there has to be a quick and efficient detection technique. Decision Tree is one of the effective data mining methods used. This research compares different algorithms of Decision Tree classification seeking better performance in heart disease diagnosis using WEKA. The algorithms which are tested is J48 algorithm, Logistic model tree algorithm and Random Forest algorithm. The existing datasets of heart disease patients from Cleveland database of UCI repository is used to test and justify the performance of decision tree algorithms. This datasets consists of 303 instances and 76 attributes. Subsequently, the classification algorithm that has optimal potential will be suggested for use in sizeable data. The goal of this study is to extract hidden patterns by applying data mining techniques, which are noteworthy to heart diseases and to predict the presence of heart disease in patients where this presence is valued from no presence to likely presence.

Poornima Singh et.al., discussed that 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, an effective heart disease prediction system (EHDPS) is developed using neural network for predicting the risk level of heart disease. The system uses 15 medical parameters such as age, sex, blood pressure, cholesterol, and obesity for prediction. The EHDPS predicts the likelihood of patients getting heart disease. It enables significant knowledge, eg, relationships between medical factors related to heart disease and patterns, to be established. We have employed the multilayer perceptron neural network with backpropagation as the training algorithm. The obtained results have illustrated that the

designed diagnostic system can effectively predict the risk level of heart diseases.

2.

2.1. Existing problem

Cardiovascular diseases (CVDs) are the number 1 cause of death globally, taking an estimated 17.9 million lives each year, which accounts for 31% of all deaths worldwide.

Heart failure is a common event caused by CVDs and this dataset contains 9 features that can be used to predict mortality by heart failure. Manually, we have to write the code for prediction.

Disadvantage:

So the cost and elapsed time will be increased. App development using some advanced languages.

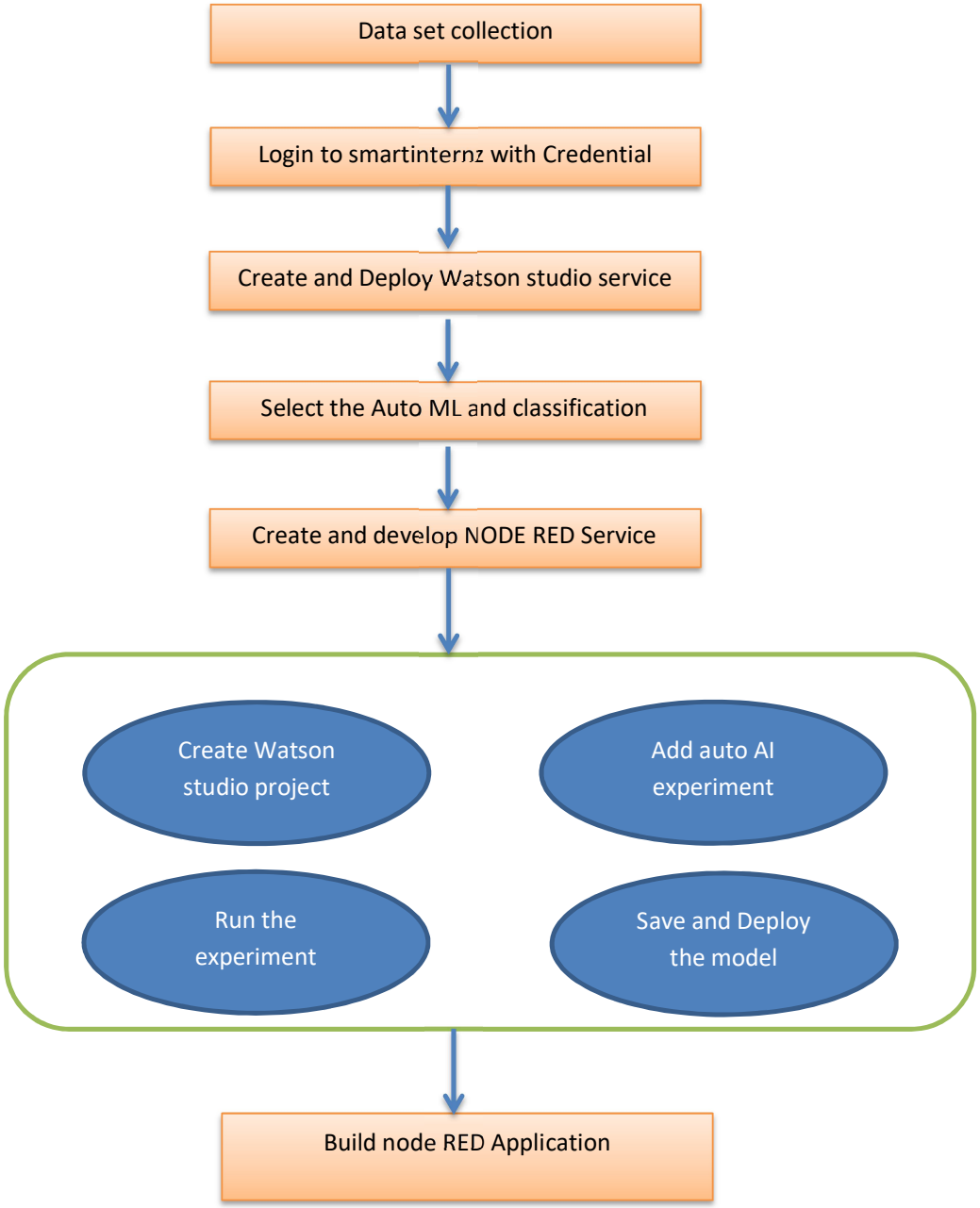
2.2. Proposed solution

In this project, I build a model using Auto AI and developed a web application where we can get the prediction of heart failure. This application uses the node red services where we can import the JSON file and updated the API Key and endpoint in the node.This enables to predict the whether a person is affected with heart failure or not.

CHAPTER 3 – THEORITICAL ANALYSIS

3.

3.1. Block diagram

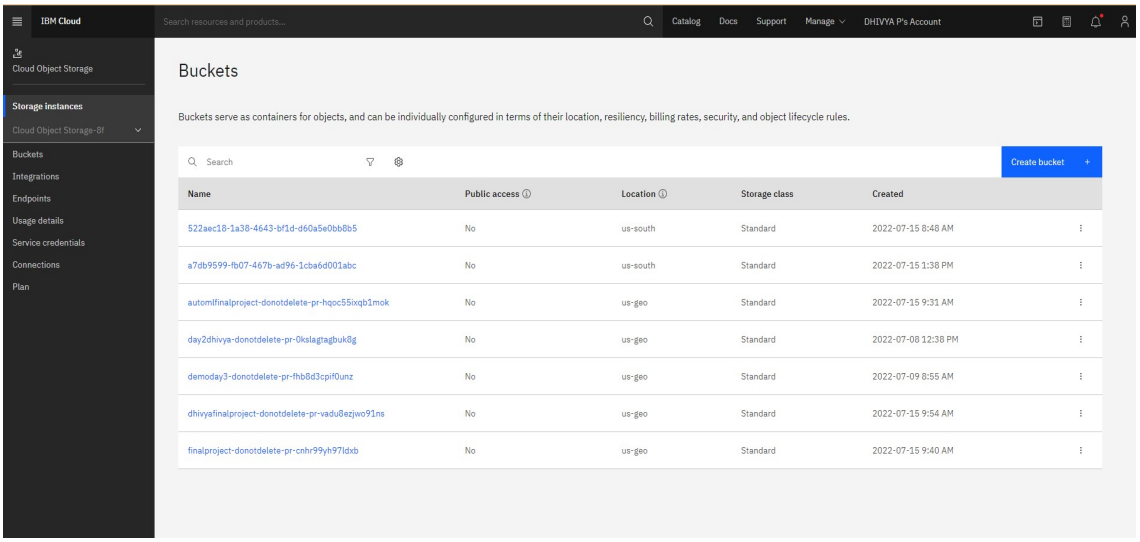


3.2. Hardware / Software designing

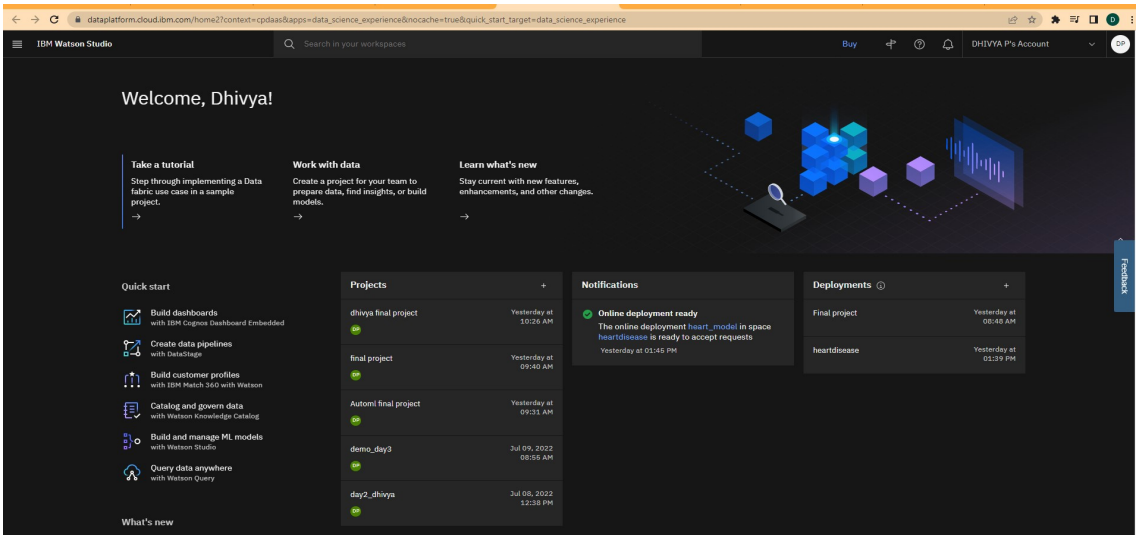
- Watson studio
- Node-RED
- Cloud Object Storage service (COS)
- Machine Learning service (ML)

CHAPTER 4 – EXPERIMENTAL INVESTIGATIONS

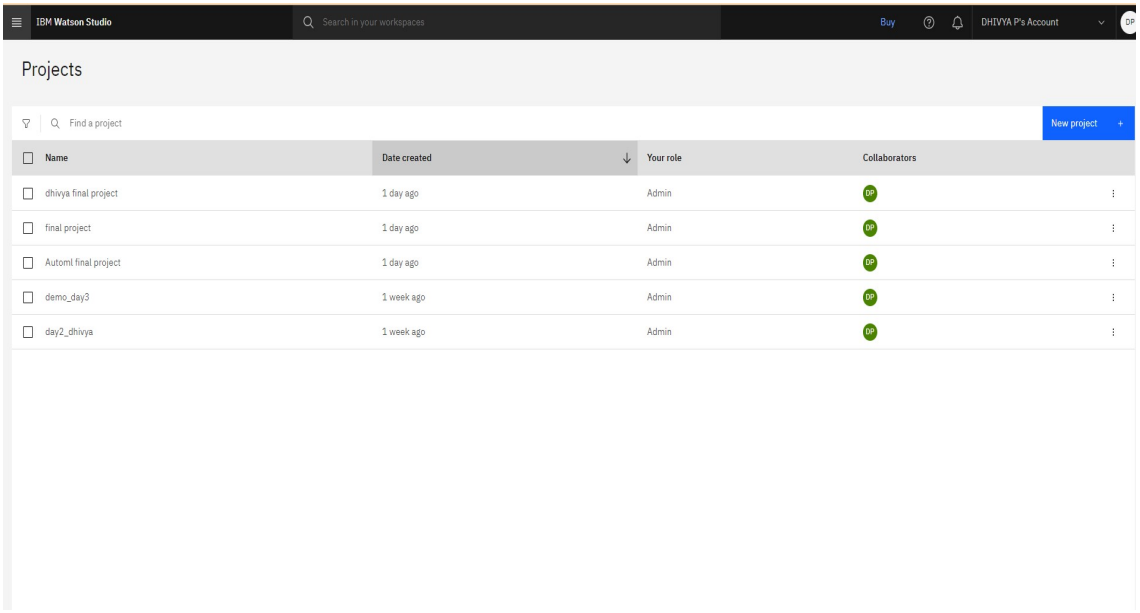
1. CLOUD STORAGE INSTANCES



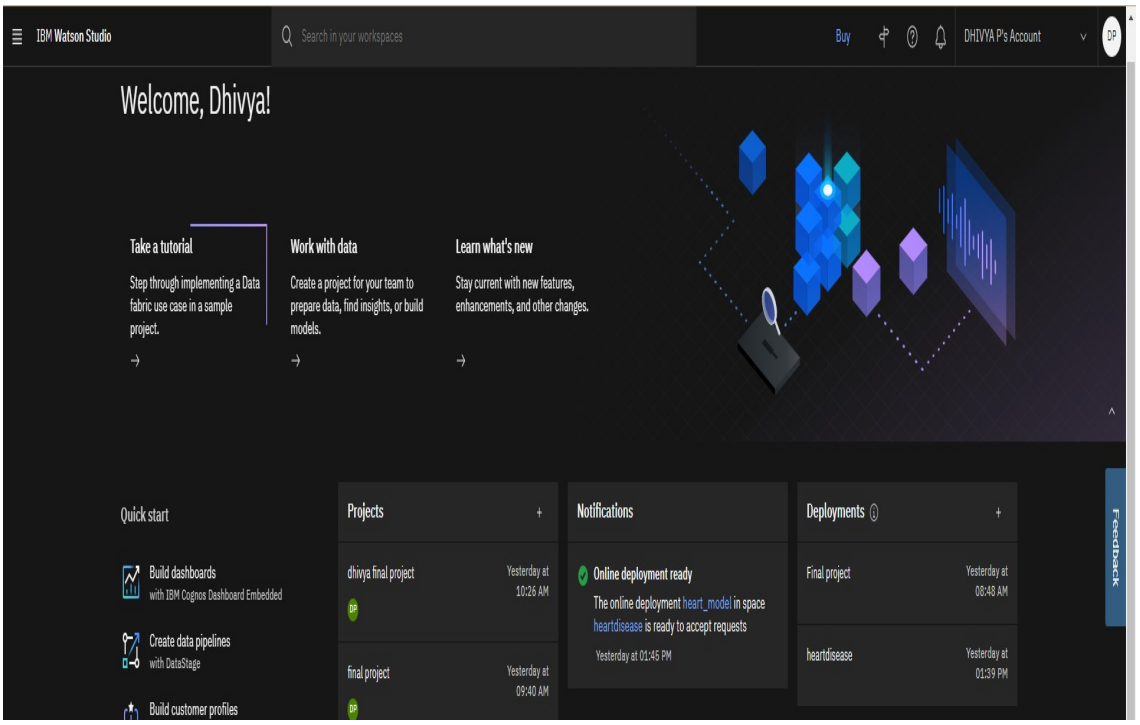
2. WATSON STUDIO NOTEBOOK PREPARATION



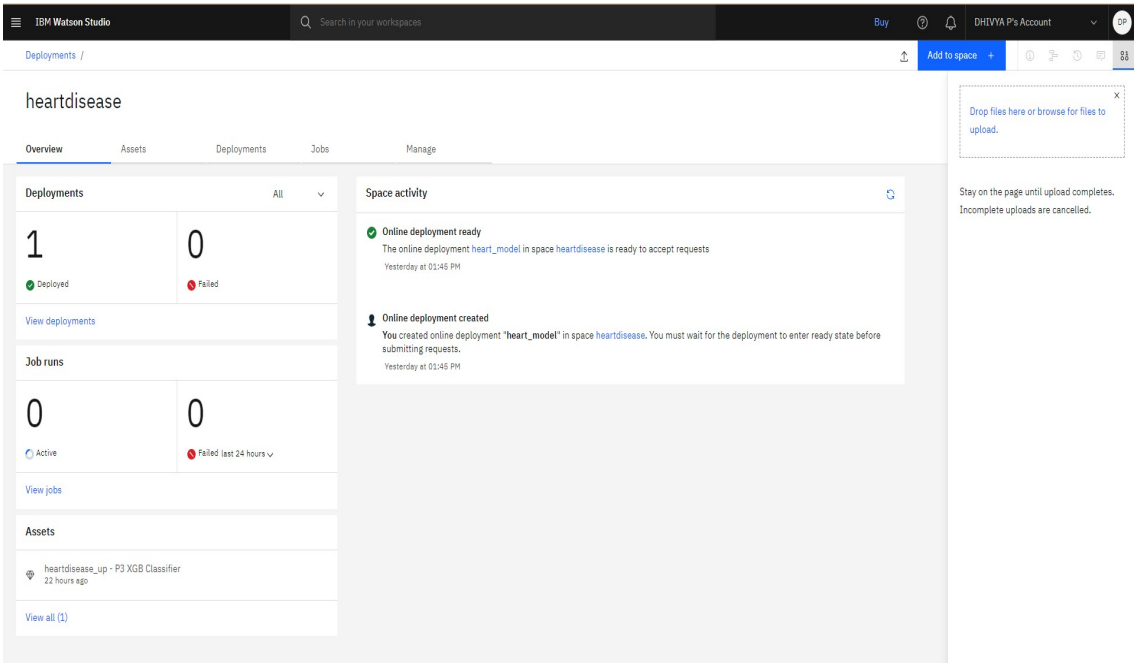
3. LIST OF PROJECTS



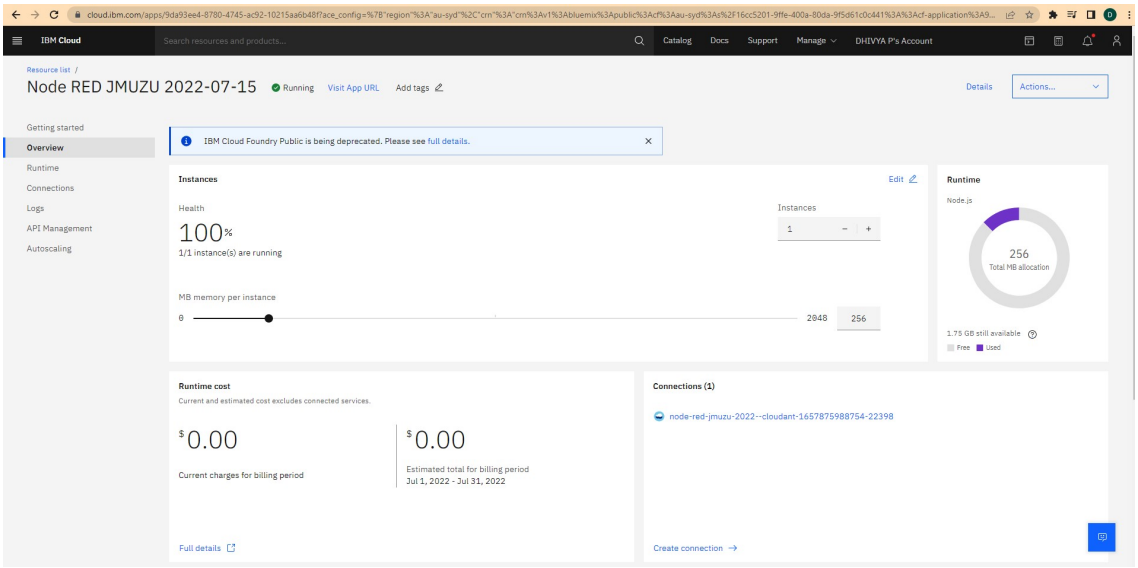
4. MACHINE LEARNING PROJECT DEPLOYMENT



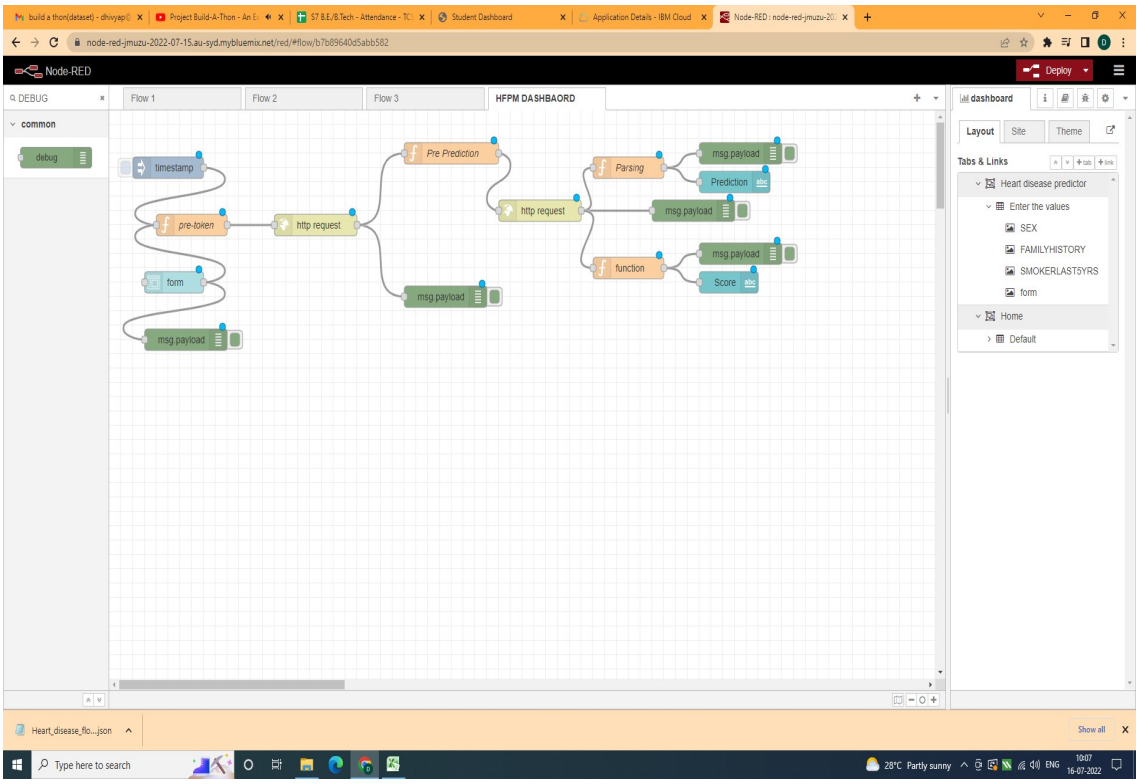
5. ORGANIZATION AND SPACE CREATION FOR DPELOYMENT



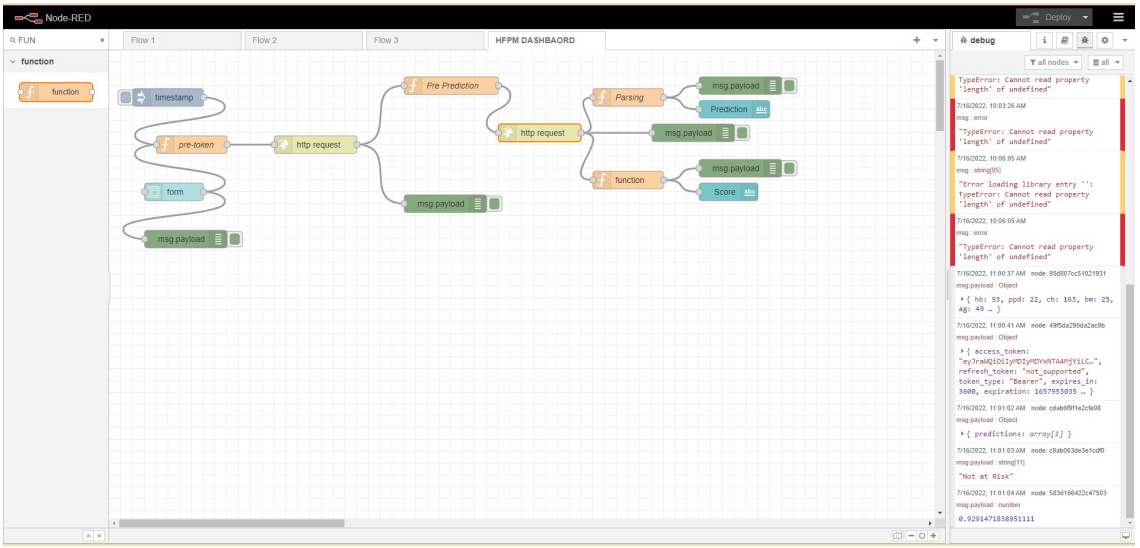
6. NODE RED DEPLOYMENT



7. UI CREATION IN NODE RED

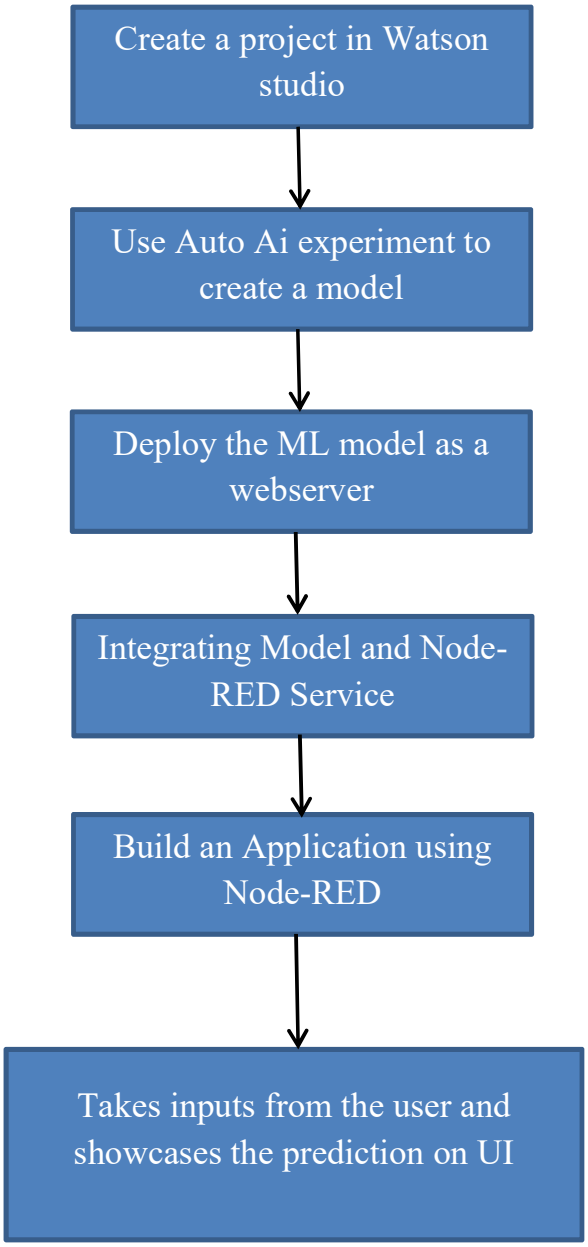


8. DEBUGGING THE OUTPUT



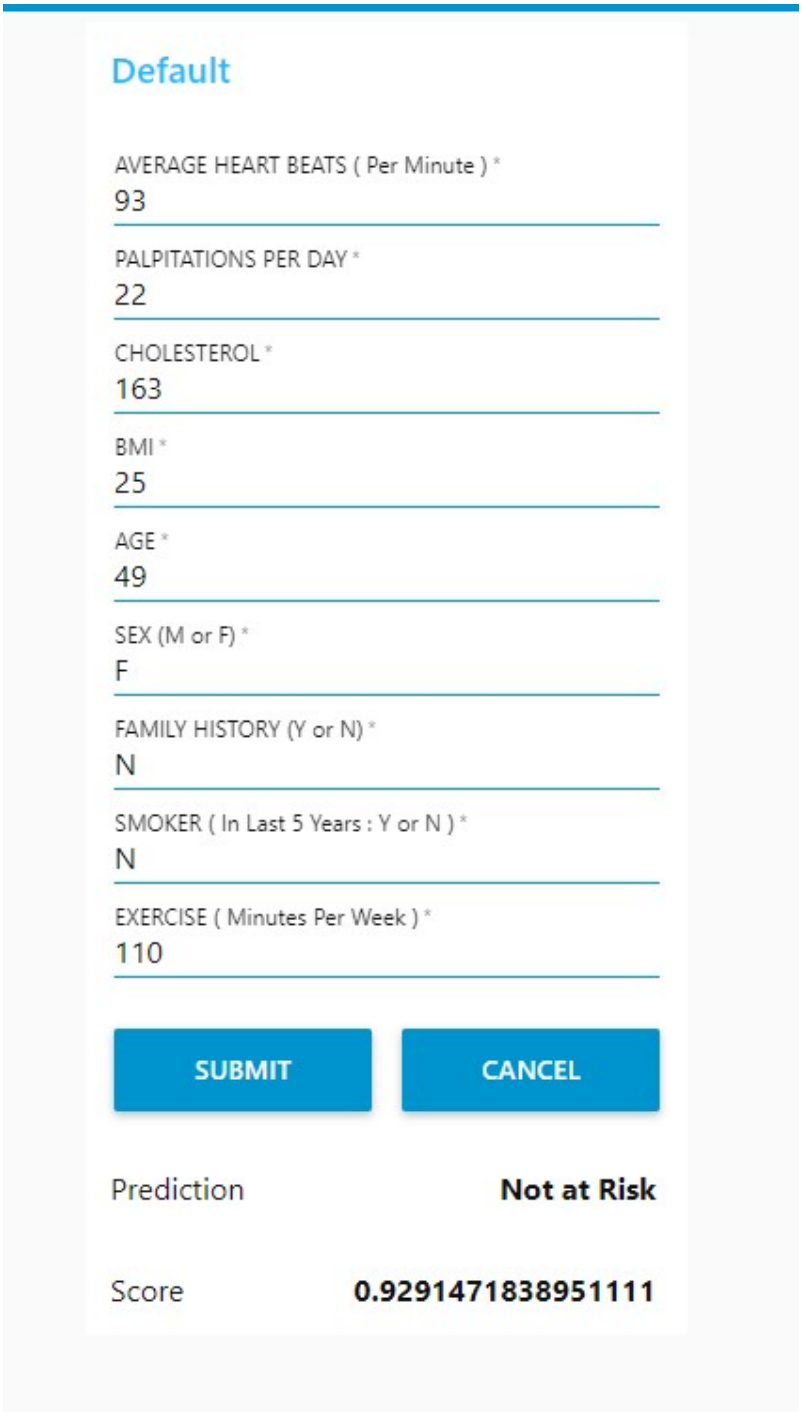
CHAPTER 5 – FLOWCHART

Diagram showing the control flow of the solution



CHAPTER 6 – RESULT

OUTPUT



CHAPTER 7 – ADVANTAGES & DISADVANTAGES

ADVANTAGES

- Reduces the elapsed time
- Reduces the cost of the model (Elite)
- Easy to implement
- Less number of lines to code
- Comparative analysis of various models
- The automatic basic performance analysis

DISADVANTAGES

- Need to upload the new instances from initial steps
- Limited number of performance metrics are analysed
- Lack to embed the custom code in the model
- Lack of state of art models

CHAPTER 8 – APPLICATIONS

The applications of auto ml model are listed below

- Medical disease diagnosis
- Retail shop
- Disease prediction in plants
- Marketing
- Customer churns prediction.
- Process automation.
- Fraud detection.
- Personalized marketing.
- Anomaly detection.

CHAPTER 9 – CONCLUSION

AutoML offers an interesting approach to AI and will lower the AI entry barrier in many cases. As a result both prototyping and small scale AI solutions can get up and running with virtually no cost. This auto AI model with less effort allows the medical professional to take this outcome as a second opinion to diagnose the disease. Thus the IBM Watson studio and node red services made a model with less effort.

CHAPTER 10 - FUTURE SCOPE

Thus the proposed web application will be very useful to develop an instant application without code. This will be applicable to Retail shop; Disease prediction in plants, Marketing, Customer churns prediction and Process automation for better prediction and classification. There are a few treatment strategies for a patient once analysed with a specific type of coronary illness. Information mining can be of awesome assistance in choosing the line of treatment to be trailed by separating information from such reasonable data sets.

CHAPTER 11 – BIBILOGRAPHY

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2. **https://www.analyticsinsight.net/leading-edge-applications-of-machine-learning-and-artificial-intelligence/**
3. **https://smartinternz.com/ibm-project/81**
4. Ramalingam, V.V., Dandapath, A. and Raja, M.K., 2018. Heart disease prediction using machine learning techniques: a survey. International Journal of Engineering & Technology, 7(2.8), pp.684-687.
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