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# Heart health prediction using web application

**Jagadevi N Kalshetty**

Nitte Meenakshi Institute of Technology, Bengaluru-560064, India

**Achyutha Prasad N**

East West Institute Of Technology, Bengaluru-560091, India

Corresponding author email: [achyuth001@gmail.com](mailto:achyuth001@gmail.com)

**Devesh Mirani**

Nitte Meenakshi Institute of Technology, Bengaluru-560064, India

**Harsh Kumar**

Nitte Meenakshi Institute of Technology, Bengaluru-560064, India

**Harshil Dhingra**

Nitte Meenakshi Institute of Technology, Bengaluru-560064, India

**Abstract**---It is said that the “heart is health” heart acts as a valve that pumps oxygenated and deoxygenated to and from the lungs its one of the most vital organs of the body and very sensitive and vulnerable as well. It has been observed that nowadays due to changes in lifestyle, irregularities, carelessness and extensive workload are the main reason for heart attacks in many people below 40 years of age and they are prone of are getting heart attacks, at least 25% of Indians and 1 out every 5 heart attack cases are aged below 40, in addition, this percentage reaches till 75% if we consider people age threshold id 50.

**Keywords**---machine learning, classification, data analysis, data science, heart disease, web application.

**Introduction**

In India, the last 20 years have been most terrifying due to the heart attacks of young Indians (less than 50 years). It has almost doubled and 25 percent of those heart attacks occur amongst those persons who are below 40 years of age. This happens due to irregularities in lifestyle and ignorance of people towards health, especially towards the small but yet important factors. These factors range from an increased level of blood sugar level, spiked body mass indexes, sleep irregularities, sedentary lifestyle, bad habits including smoking, untracked

alcohol consumption. In addition to this people are adamant regarding regular full body check-ups reasons being carelessness, spiked prices of India's healthcare services, and lack of trust amongst people for government healthcare providing. Our project focuses on all these atomic factors that may sound unimportant yet being the causes for heart-related issues and deaths.

## Method

The working of the model involves division of dataset into training set and validation set, then application of random forest classifier to predict the condition of heart. 80% of the dataset has been kept for training and rest 20% for the validation set. The Figure below shows the flow diagram of the entire model and application.

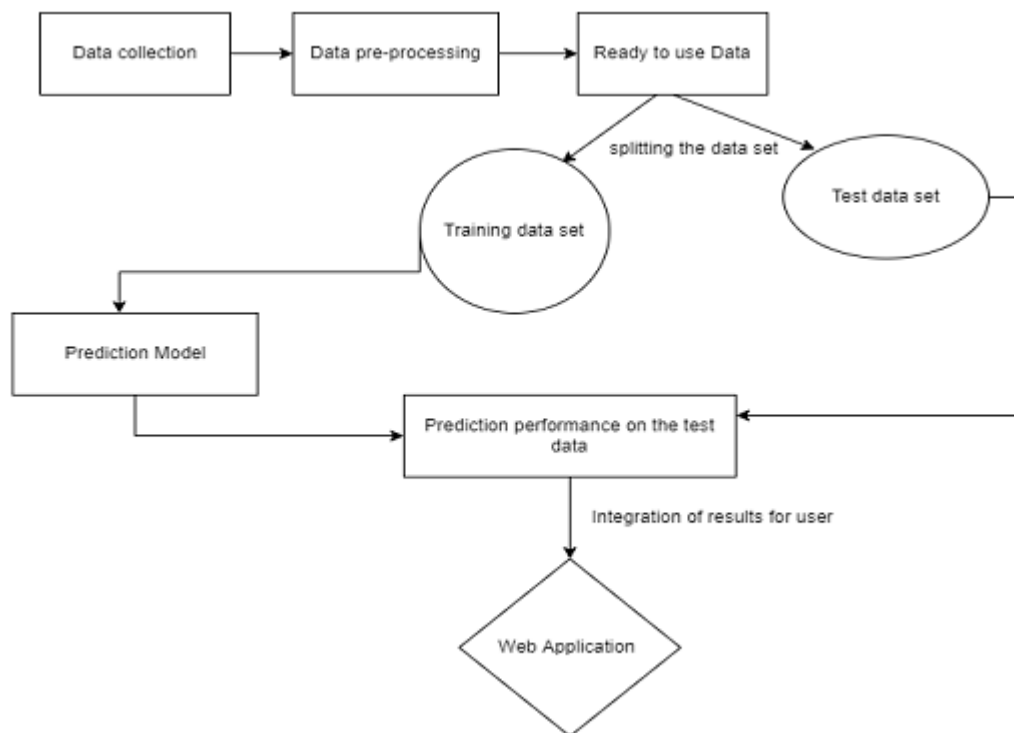


Figure 1 The flow diagram

## Discussion

The entire model is integrated to an user-friendly web interface where values can be input and prediction is being made. The project makes use of libraries such as "streamlit", "seaborn", "numpy", "pandas", "matplotlib", "sklearn". Streamlit is used for integrating the machine learning model to a web interface. Streamlit seamlessly performs this task and makes it very easy to run the machine learning model. Scikit-learn was used to create the test train split which helped in creating the training and validation samples. Scikit-learn metrics were used to

identify the precision of the model with the help of the classification report. Accuracy of the model was also shown.

Changing the values of different attributes was also allowed on streamlit , accordingly the prediction was reported along with the accuracy of the model. Model worked as expected, we were able to provide different values for the attributes and were getting outputs with an accuracy of 75-82%.

### Test Case 1



Figure 2 Input Parameters

Above in the figure 2 , we have given input for all the parameters that are influencing the heart health in our model. For males, the number of pregnancies can be given input as 0. The output for this is given in the figure below.

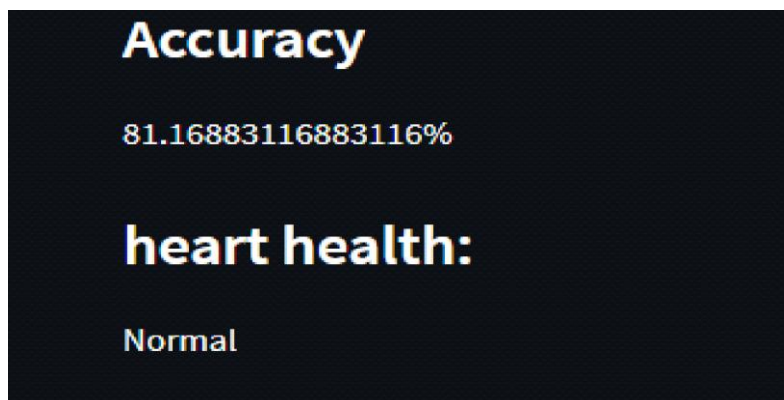


Figure 3 : Output in accordance with figure 2

Figure 3 is the output that we are getting after input of values shown in figure 2. In this case we are getting the heart health as “Normal”. Let’s jump to another case , with different values.

### Test Case 2



Figure 4 - Input Parameters

Figure 4 , shows another set of values as input for the parameters. The output of this is showed in the figure below.

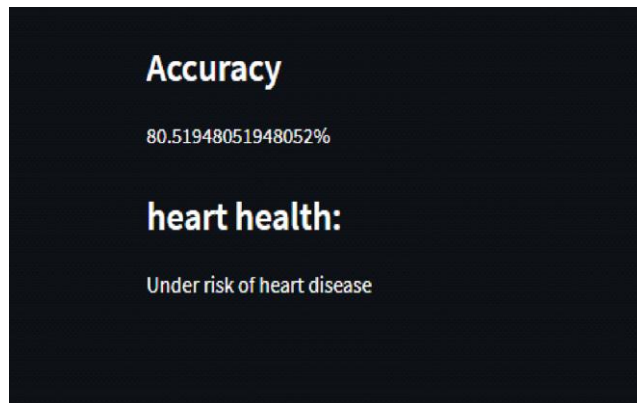


Figure 5: Output in accordance with figure 4

Figure 5 shows the output which we are getting for the values as input in figure 4. In this one we are getting the heart health as “Under risk of heart disease”.

## Conclusion

This paper provides a review of the chances of heart risk or disease considering the several parameters which contribute to and affect these are heart health are glucose level, BP(blood pressure), skin thickness, insulin level, BMI(Body Mass Index), DPF (Diabetes Pedigree Function), pregnancy (in case of women) respectively. We have achieved accuracy in the range of 75-82% and used a random forest classifier for implementation and presented it as a web application using streamlit

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