

## Heart Disease Prediction

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### 1. Abstract:

*The human heart is the principal part of the human body. It regulates blood flow throughout our body. In today's world, approximately one person dies per minute due to one disease i.e., heart disease. A healthy lifestyle and the earliest detection are the only ways to prevent heart-related diseases. It is seen that many people die at early age, and this is due to change in the lifestyle of the person, also many users are detecting this after a long time which sometimes get too late to save the patient so we tried to make a project that would help the people to remain updated about their health and can save their life if disease is predicted. For efficient heart disease prediction with greater accuracy various Machine Learning models are used i.e., logical regression, linear regression, KNN, etc., and many more. This research paper focuses on the solution to solve this problem.*

### 2. Introduction:

The data mining on this technique especially specializes in diverse practices on the way to assist in coronary heart disorder prediction. The human coronary heart is the fundamental part of the human body. It enables blood to waft all through our

bodies. Any disturbance withinside the coronary heart can motivate misery in different components of the body. Any kind of imbalance withinside the regular functioning of the coronary heart may be categorized as Heart Disease. It happens when coronary arteries end up blocked. The severe circumstance happens when one or extra coronary arteries end up blocked. In the state-of-the-art cutting-edge world, coronary heart disorder is one of the number one motives for the prevalence of maximum deaths. Heart disorders can also additionally arise because of now no longer following a healthy lifestyle, dependence on smoking, alcohol, and excessive consumption of fats that ends in hypertension. The major motives for coronary heart assault are blood pressure, cholesterol, and pulse. According to the WHO, extra than 10 million die because of Heart Disease. A simply healthful lifestyle and the earliest detection is the most effective manner to save you from coronary heart-associated diseases.

Data mining enables inspecting and digging for essential statistics from a big quantity of statistics required for prediction. It enables addition in exploratory and instance styles so that it can make wise business-associated decisions.

Various features make contributions to coronary heart disorder prediction. Researchers around the sector especially targeted figuring out functions for use in coronary heart disorder prediction. They gave much less significance to figuring out the connection among those functions and figuring out the extent of precedence withinside the prediction model. So our approach was same to detect if there is any kind of heart disorder can be cured within the time and not causing any loss to a life.

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#### 4. Heart Disease Prediction using Machine Learning

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#### 5. Heart Disease Prediction using Machine Learning

Apurb Rajdhan , Avi Agarwal , Milan Sai ,  
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### 3. Methodology:

Heart disease is a severe issue which has increased from past few years as, also as a part of research we found that in early 2000's it was found in people between the age of 70-80 but in recent years we found that it's also affecting peoples at the young age due to change in the lifestyle of the people. So, we found this topic more important and started working on it. So, our first step was to find data for our project so we got a dataset on which we started working after finding the data our next step was to clean the data, after cleaning the data we started training our model with different algorithms and fresh data of all the patients and after training and testing we found the algorithm with higher accuracy and continued with that algorithms for further processing part of our project.

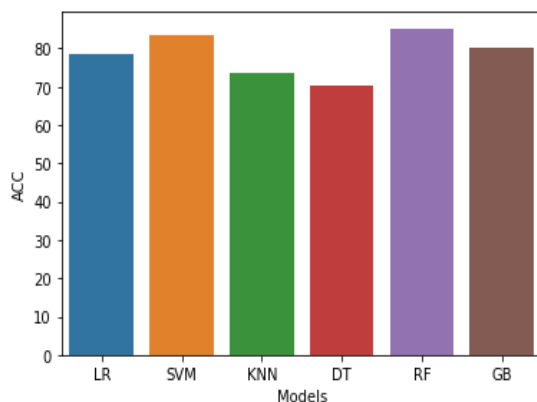
We have compared different parameters like chest pain, blood sugar level, Chest pain level, Resting Blood Pressure, cholesterol, Electro cardio graphy test etc. reports(in numeric values)

We have made this project in python as python has a vast library support and also training and testing phase is also done in an extremely better way. So we first imported several libraries from the sklearn library which is library which is used mostly in the Machine learning as it provides various helpful tools which makes training and testing of the model more and more efficient.

Algorithms which we used were:

1. Logistic Regression
2. Support Vector Machine
3. K-Nearest Neighbor (KNN)
4. Decision Tree Algorithm
5. Random forest Algorithm
6. Gradient boosting Algorithm

After comparing all these algorithms we found that the Random forest Algorithm was having higher accuracy of about 85% so we continued with this machine learning model.



( This is the graph of comparison of different algorithms which we have used )

After all these steps we started to work on making our graphic user interface in which we used python's inbuilt library tkinter in which user can enter His/her details and can get output our main focus was to make a model that will predict the heart disease as soon as possible without causing any loss of life with the fresh data of the current scenario.

#### 4. Conclusion:

We all know about the heart is the very essential part of the body and prevention of the heart from various diseases is very important. Heart diseases have been continuously increasing commonly among humans out of which mostly are of small age now which include around the world. Therefore, predicting the disease at an early stage will reduce the chances of lost of life. It is primarily based on the software of Machine Learning algorithms like the Random Forest Algorithm, Support Vector Machine, and KNN. So, with the help of a random forest algorithm, we arrived at 85% of accuracy.

#### 5. Future scope:

1. In future we can add new features like continuously monitoring of the patient health which will help both doctor and patient in such a way if there is any chance of risk the doctor can take immediate action as soon as possible in order to save a life.

2. Basically, in this ML model we are using different parameters to predict if a person suffers from heart disease or not so that we are also able to implement one important parameter like Family ground means if any closely family member is having a serious heart disease so that it produces strong Chances that person will have heart disease on the basis of all previous data of the family. Also, we are running this model locally but if we launch it into a website it will be openly available and can save many people's time and life.

3. As we create this application for health issues related with heart disease if this model is combining with health

4. professionals (Doctors), then it helps to advancing the output get from medical testing of heart disease by using deep analysis.

5. Also we can include this feature in smart watches through which real time scanning can be done and hence will help user in any case of emergency.

Therefore, it also helps to take action at early stage till disease gets lasting. We surely say that it will also improve medical analysis system.