**Measuring the Heart Attack Possibility Using Different Types of**

**Machine Learning Algorithms**

**Alternate Title:**

 Prediction of Cardiovascular Disease Using Machine Learning

**Aim**:

 To apply machine learning techniques result in improving the accuracy in the prediction of cardiovascular disease.

**Abstract:**

Heart disease is one of the most significant problem is arising in the world today. Cardiovascular disease prediction is a critical challenge in the area of clinical data analysis. Machine learning (ML) has been showing an effective assistance in making decisions and predictions from the large quantity of data produced by the healthcare industries and hospitals. This project proposes a prediction model to predict whether a person has a heart disease or not and to provide awareness or diagnosis on the risk to the patient. The prediction model is projected with mixtures of various options and a number of other classifications techniques. This is done by comparing the accuracies of different algorithms to the separate results of SVM, KNN, Decision Tree and Random Forest and uses the algorithm with high accuracy for prediction. Our goal is to enhance the performance of the model by removing unnecessary and insignificant attributes from the dataset and only collecting those that are most informative and useful for the classification task. Thus the main focus of the system is to make use data analytics to predict the presence of the disease or not.

**Introduction:**

Heart is an important organ of the human body. It pumps blood to every part of our anatomy. If it fails to function correctly, then the brain and various other organs will stop working, and within few minutes, the person will die. Healthcare means the maintenance or advancement of health through the prevention and diagnosis of people. Nowadays, healthcare is increasing day by day due to lifestyle and hereditary. Cardiovascular disease has become the deadliest enemy. A person with cardiovascular disease cannot be cured simply. So, diagnosing patients at the correct time is the toughest work in the medical industry and needs to be diagnosed at initial stages to reduce the risk on the patient in the future. Every human body possesses different numbers for blood pressure, cholesterol, and pulse rate. But the normal values would be, blood pressure is 120/80, cholesterol is 200 mg/dl and pulse rate is 72. So combining these machine learning algorithms with medical data sources is useful. This paper suggests different machine learning methods that are useful for forecasting the uncertainty levels of cardiovascular disease for a person depending on the collected attributes.

**Existing System:**

 Over the past decades, heart disease is a common and dangerous disease caused by fat suppression. This disease occurs due to overpressure in the human body. In traditional method doctors may make some mistakes in found a disease, but now days Machine learning play a great roll in prediction. We can predict cardiac disease using a variety of parameters in the dataset. The obtained results are compared with the results of existing models within the same domain and found to be improved. The data of heart disease patients collected from the UCI laboratory is used to discover patterns with Random Forest and Decision Tree. To make this system user friendly, so we move to the next update.

**Proposed System:**

 In our proposed system, we use multiple algorithms for high accurate level of prediction. The algorithms used in our proposed systems are Support Vector, KNN, Decision Tree and Random Forest machine learning technique for heart disease prediction of significant features. ML process starts from a pre-processing data phase followed by feature selection based on data cleaning, classification of modeling, performance evaluation, and the results with improved accuracy. After creating a trained dataset, User should register on android app. After login to the app, user will give the input. That input passes to firebase. Firebase acts as an intermediate between trained dataset and user. After the prediction, the predicted value passes to the Firebase. That Firebase gives the predict value to the user on android app via notification.

**Module Description:**

* Data Pre-Processing
* Algorithm Implementation
* Prediction

**Data Pre-Processing:**

Data pre processing is the process of removing null values from the data set collection. We collect various records or data set from kaggle.com. The dataset contains a more number of patient records, where some records are with some missing values. Those missing records have been removed from the dataset and the remaining patient records are used in pre-processing. After that we remove some columns based on feature selection

**Algorithm Implementation:**

 The Classification Algorithms to produce the best result in prediction. We are using SVM, KNN, Decision Tree and Random Forest Algorithm to predict the Heart disease using ML. The clustering of datasets is done on the basis of the variables and criteria of Decision Tree (DT) features. On an analysis conducted within various algorithms, the KNN was found to provide highest efficiency. Then, the classifiers are applied to each clustered dataset in order to estimate its performance. The best performing models are identified from the above results based on their low rate of error.

* Decision Trees Classifier
* Support Vector Classifier
* Random Forest Classifier
* K- Nearest Neighbor

**Prediction:**

When the user should registers them on the android app. After complete registration, user will login to the app to predict the heart disease. Once the user gives input, that inputs goes to the firebase. Then the firebase sent this data to machine learning. Already we have trained dataset. Here the prediction process is done. That predicted data given to user via Firebase. User will get notification for the result output on android app via notification.

**Software Requirements:**

* Operating System : Windows 10 (64 bit)
* Software : Python 3.7
* Tools : Jupyter Note Book, Android
* Cloud : Firebase

**Hardware Requirements:**

* Hard Disk : 500GB and Above
* RAM : 4GB and Above
* Processor : I3 and Above

**Architecture Diagram:**

Dataset Collection

Training

Data

Prediction

 Firebase

Machine Learning

Algorithm

Data Preprocess

Heart diseases Identification

Android

