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Heart Attack Prediction using Machine Learning Algorithm

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ABSTRACT: These days, there is a lot of information available to us, which might lead to information overload. Regression, classification, clustering, and association are just a few of the methods used by machine learning, one of the most significant sciences, to extract meaningful information from order sets. It is used in a wide range of distinctive industries, such as the banking industry, market research, social network analysis, analysis of medical knowledge, analysis of the securities market, and others. One of the most significant applications of machine learning is in the care sector. The tending trade produces a tremendous quantity of data every day about patients, illnesses, hospitals, medical tools, and treatment expenses. One of the most vital organs in the body is the sense of sensation.

KEYWORDS: Heart Disease, Machine Learning, Feature Selection, Decision Tree, Classification, logistic Regression, predictive model.

I. INTRODUCTION

These days, there is a lot of information available to us, which might lead to information overload. Regression, classification, clustering, and association are just a few of the methods used by machine learning, one of the most significant sciences, to extract meaningful information from order sets. It is used in a wide range of distinctive industries, such as the banking industry, market research, social network analysis, analysis of medical knowledge, analysis of the securities market, and others. One of the most significant applications of machine learning is in the care sector. The tending trade produces a tremendous quantity of data every day about patients, illnesses, hospitals, medical tools, and treatment expenses. One of the most vital organs in the body is the sense of sensation.

It is in charge of moving blood to the remainder of the body. The emotion can be impacted by a number of illnesses, including heart disease, inborn heart defects, heart artery disease, blood vessel infection, regular emergence abnormality, heart condition, heart infection, and heart valve disease. The most important task in the profession of healthcare is the detection of illness.

If an illness is diagnosed early, a lot of lives can be spared the most important task in the medical field is to detect illness and decrease with observation of different symptoms and health parameter which is monitors using different test. Machine learning method make. The most important task in the profession of healthcare is the detection of illness. If an illness is diagnosed early, a lot of lives can be spared This investigation's scope is only limited to the misuse of three directed learning techniques—Innocent Bayas (NB), Backing Vector Machine, and (SVM). in addition, "heart illness heart condition cardiopathy cardiovascular disease" may be a prevalent disease that is not classified into a specific cohort due to the high death rate in past years. Additionally, "heart disease heart condition cardiopathy cardiovascular disease" may be a common illness that is not specific to a particular community due to the high death rate in prior years.

II. RELATED WORK

It is in charge of transporting blood to the body's other parts. Numerous diseases, such as heart disease, inborn heart defects, heart artery disease, blood vessel disease, regular appearance abnormalities, heart condition, heart infection, and heart valve disease, can have an impact on the emotion.

This system contributed to home monitoring, diagnosis, medical prescriptions, medical treatment, rehabilitation and development of his patients with Parkinson's disease. Wireless Health Monitoring System (WHMS) has attracted considerable attention from the research community and industry over the last decade. Improvement of several

Machine learning algorithms and classifier performances like weighted associative classifier were reported in the detection of cardiac abnormalities

More than twenty machine learning algorithms available to the UCI Machine Learning Repository Dataset and Stat log Database for Heart disease prediction to validate the model performance. Among those some with greater accuracy (i.e., more than 80%) are taken into consideration for performance measurement and they are described briefly below:

1. Logistic Regression:

- Logistic regression is basic algorithm of machine learning which is used mathematics to find out the relationship between the dependent variables.
- Logistic regression mainly uses sigmoid as cost function.
- Logistic regression is a statistical analysis method to predict a binary outcome, such as yes or no, on the based of observations of a data set.
- Logistic regression is used to solve classification problems
- Logistic regression is a class of regression where the independent variable is used to predict the dependent variable.
- Using logistic regression, the problems of classification can be solved.
- The logistic function is of the form: $p(x) = \frac{1}{1 + e^{-\frac{(x-\mu)}{s}}}$

Disadvantages:

- Logistic regression does not predict a continuous outcome.
- Logistic regression may not be accurate if the sample size is too small.
- Logistic regression assumes linearity between the dependent variable and the independent variables.
-

2. K Nearest Neighbour:

- KNN algorithm is the type of supervised machine algorithm
- It can be used for the classification problem.
- KNN algorithm is non-parametric algorithm
- KNN is easy to understand and simple to implement
- It can handle multiclass data
- KNN is useful when labelled data is too expensive or impossible to obtain, and it can achieve high accuracy in a wide variety of prediction-type problems

Disadvantages:

- KNN is called lazy because it doesn't learn a discriminative function from the training data but memorizes the training dataset instead.

3. Naive Bayes:

- Naive Bayes is a very powerful algorithm for predictive modelling.
- It is a statistical classifier which assumes no dependency between attributes attempting to maximize the posterior probability in determining the class.
- Theoretically, this classifier has the minimum error rate, but may not be the case always.
- Inaccuracies are caused by assumptions due to class conditional independence and the lack of available probability data.

Disadvantages:

- Naive Bayes assumes that all features are independent, this scenario not happen in real life.

- This algorithm faces the 'zero-frequency problem' where it assigns zero probability to a categorical variable whose category in the test data set wasn't available in the training dataset.

4. **Decision Tree:**

- Decision trees in machine learning gives prediction an effective method for making decisions because they lay out the problem and all the possible outcomes.
- In these decision trees, nodes represent data rather than decisions. This type of tree is also known as a classification tree

Disadvantages:

- As compared to other tree algorithm Decision Tree is highly unstable
- Small changes in the data set may occurs large changes in output.

5. **SVM:**

- SVM is support vector machine
- A support vector machine (SVM) is a type of deep learning algorithm that performs supervised learning for classification or regression of data groups.
- The main objective of SVM is to find to find a hyperplane in an N-dimensional space that distinctly classifies the data points. The dimension of the hyperplane depends upon the number of features

6. **Random Forest**

- Random forest is used as a supervised machine learning technique and it is well defining model.
- In this model everyone uses this technique for both regression and classification problem.
- Ensemble learning idea is used in random forest model.
- It is one of the classifiers that accommodate the number various subset of given data set in decision tree and finalise the predicted accuracy of the given data set based on the given label.

The focus of this analysis is restricted to the abuse of three directed learning techniques: Backing Vector Machine, Naive Bayas (NB), and (SVM). Due to the high death rate in previous years, "heart ailment heart condition cardiopathy cardiovascular disease" may also be a common disease that is not categorised into a specific cohort. Additionally, due to the high death rate in "heart disease heart condition cardiopathy cardiovascular disease," it may be a widespread disorder that is not unique to a particular community.

III. METHODOLOGY

In this strategy, we'll use entirely distinct computations from computer-based intelligence to provide us a conjecture about the likelihood that knowledge will be useful in datasets. While Kumar, N., and Kumar, S. (2018)'s study aimed to analyse polygenic disorder by anticipating collection and representation. The audit involved 650 patients, the clean was applied to three Packs, and each group was separated based on the amount of risk (mid, moderate and serious), to examine overall performance and record the show-maintained accuracy and error rate. The audit's findings indicated that the C4.5 tree had the best precision and comparable 100% accuracy. We frequently observed that the information mining process was unreliable in every assessment

IV. EXPERIMENTAL RESULTS

Heart sicknesses region unit among the principal risky and standard reasons for death in our current time. In this way, it's important to survey the years that affect ailment heart condition cardiopathy cardiovascular disease} irregularly and over and again in order to early location and therapy of illness states, stop complexities of disorder states, find actual handicaps, work on their restoration, work on adjusting actual imperfections, and work to support the wellbeing level of the individual and society. The significance of this examination lies in figuring out the significance of things that meaningfully affect the rate of heart condition, and admittance to an extraordinary device that assists specialists with dissecting heart condition to downsize the significant investment spent on looking at patients, on the grounds that the apparatus could be a reference for them in their work.



Algorithms	Accuracy
Logistic Regression	85.25
Support Vector Machine	81.97
KNearest Neighbour	67.21
Naive Bayes	85.25
Decision Tree	81.97
Random Forest	89.10

Fig . Experimental Result analysis using different algorithm

. An uncommon improvement very much like the spread calculation, Net innovation, subject association and equipment development has made distributed computing development.

. As refreshing realities will convey significant instinct into medicines fundamental to with the exception of a patient's life. Through cycle care, if all data intentionally accessible and possible to supported clinical people all time from wherever then it'll be valuable to prepared antibody and deal with patient realistic image like Corona virus.

The need to project fluctuated cycle care framework that is innocuous and usable. This review accompanied the point of double-dealing AI to break down heart sicknesses, double-dealing arrangement Relapse for grouping we tend to get reasonable exactness concerning 87 that is more grounded than the standard methods.

V. CONCLUSION AND FUTURE SCOPE

CONCLUSION:

The Random Forest algorithm is a powerful collaborative learning system for regression and classification procedures. The procedure generates N Decision trees and returns the session that is the middling of all the Decision trees outputs. As a result, early-stage prediction accuracy is efficiently accomplished. The handling of healthcare records, specifically records connected to the heart, will aid in the early recognition of heart attacks or aberrant heart conditions, saving lives in the long run.

In today's world, predicting heart attacks is a huge challenge. If the patient or user is unable to contact a surgeon, he or she can utilize this application to anticipate a heart attack simply by putting the report standards. And can decide whether or not towards seek medical advice.

FUTURE SCOPE:

This application can be enhanced in the future by addition of new functionalities, such as directing a message to all of the patient's family members if a heart attack is predicted. The info must also be forwarded to local hospital. Additional option that would be provided is online doctor discussion with the other doctor.

It's worth noting that ML applications based on numerous efficient algorithms are used not only in the field of heart attack prediction and analysis, but similarly in radiology, bioinformatics, and medicinal imaging analysis.

REFERENCES

- [1] UCI Machine Learning Repository [homepage on the Internet]. Arlington: The Association; 2006 [updated 1996 Dec 3; cited 2011 Feb 2]. Available from: <http://archive.ics.uci.edu/ml/datasets/Heart+Disease>
- [2] Soni J, Ansari U, Sharma D and Soni S 2011 Predictive data mining for medical diagnosis: an overview of heart disease prediction International Journal of Computer Applications 17 43-8Google Scholar.



- [3] Shinde R, Arjun S, Patil P and Waghmare J 2015 An intelligent heart disease prediction system using k-means clustering and Naïve Bayes algorithm International Journal of Computer Science and Information Technologies 6 637-9
- [4] Yadav, D. K., Kumar, S., Misra, S., Yadav, L., Teli, M., Sharma, P. & Kim, M. H. (2018). Molecular insights into the interaction of rons and thieno [3, 2-c] pyran analogs with SIRT6/COX-2: a molecular dynamics study. Scientific reports, 8(1), 1-16.
- [5] Lokesh M. Giripunje (Dr. D. Y. Patil Institute of Engineering, Management and Research, Akurdi, India), Tejas Prashant Sonar (Dr. D. Y. Patil Institute of Engineering, Management and Research, Akurdi, India), Rohit Shivaji Mali (Dr. D. Y. Patil Institute of Engineering, Management and Research, Akurdi, India), Jayant C. Modhave (Dr. D. Y. Patil Institute of Engineering, Management and Research, Akurdi, India) and Mahesh B. Gaikwad (Dr. D. Y. Patil Institute of Engineering, Management and Research, Akurdi, India)
- [6] E Taylor, P S Ezekiel, F B DeedamA Model to Detect Heart Disease using Machine Learning algorithm International journal of Computer Science and engineering, volume 7 Posted: 2019
- [7] HEART DISEASE PREDICTION USING MACHINE LEARNING", International Journal of Emerging Technologies and Innovative Research (www.jetir.org), ISSN:2349-5162, Vol.7, Issue 6, page no.2081-2085, June-2020, Available:<http://www.jetir.org/papers/JETIR2006301.pdf>
- [8] archana Singh, Rakesh KHeart disease Prediction Using machine Learning Algorithms International Conferences on Electrical and electronics Engineering Posted: 2020
- [9] Multi-Knowledge Electronic Comprehensive Journal for Education and Science Publications (MECSJ) ISSUE (29), February (2020) ISSN: 2616-9185
- [10] Rajkumar A, Reena GS. Diagnosis of heart disease using datamining algorithm. Global Journal of Computer Science and Technology 2010; 10:38-43.
- [11] Dangare C S and Apte S S 2012 Improved study of heart disease prediction system using data mining classification techniques International Journal of Computer Applications 47 44-8
- [12] International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429 Volume 9 Issue VI Jun 2021- Available at www.ijraset.com



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