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HEART DISEASE PREDICTION USING MACHINE LEARNING

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ABSTRACT:

Heart disease is a major cause of death throughout the world. It is difficult to predict by medical practitioners as it requires expertise and higher knowledge of prediction. Heart disease prediction system is a project which provides an easy way to predict the risk level of patients with heart disease. R is the best programming language to create reproducible, high-quality analysis. Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. R programming is most suitable for Machine learning algorithms. Here we are using different machine learning supervised learning algorithms which consists of a target/outcome variable which is to be predicted from a given set of predictors (independent variables).
Keywords:- Machine learning, Heart disease, Prediction, Algorithms

1.INTRODUCTION

Cases of heart illness are developing at an alarming pace, and it is critical and serious to anticipate any such ailments in advance. This is a challenging process that must be completed accurately and effectively. In high-risk individuals, early detection of cardiac disease is essential for making lifestyle changes that reduce consequences. The article's main emphasis is on which persons, depending on a variety of medical circumstances, are more prone to get heart disease. Based on the patient's medical history, we created an algorithm to predict whether or not the patient would be given a heart disease diagnosis. With the use of machine learning techniques like calculated relapse and direct relapse, we were able to hypothesize and identify the patient with coronary sickness. Controlling how the model may be used to enhance each person's heart attack prediction accuracy was accomplished using a very helpful way. The provided cardiac disease prediction method improves medical treatment while lowering costs. This initiative provides us with valuable information that will aid in the prediction of heart disease patients.

2. LITERATURE SURVEY:

2.1 Heart Disease Prediction Using Decision Tree and Naive Bayes Algorithm

Authors: Maheswari, Subburaj, Pichai and Ramu This magazine collects a large amount of healthcare data from the healthcare business, which is regrettably not "mined" to facilitate effective decision making for the detection of hidden information. The end user support system is employed as the prediction application for heart disease, and this work suggests that the user receives instance advice for heart illness through the intelligent prediction system. The application is fed several signs of heart disease. The user begins the procedure by reviewing the specifics and symptoms of the cardiac ailment. The decision tree (ID3) and the Naive Bayes algorithm are used in data mining to learn more about each patient. The system's performance is evaluated using precise prediction of results.

2.2 Heart Disease Prediction using Machine Learning and Data Analytics Approach

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Authors: M.Marimuthu, M.Abinaya, K. S.Hariesh, K.Madhankumar and V.Pavithra After the brain, the heart is the most important organ in the human body. It circulates blood and supplies all of the body's organs with food. In the clinical industry, anticipating the frequency of heart problems is 5 significant work. In light of additional data, information examination is essential for anticipating diseases and aids medical offices in doing so. A staggering amount of patient-related information is consistently kept. The saved data can be used to predict when a disease will start. Data mining and machine learning techniques like the Artificial Neural Network (ANN), Decision Tree, Fuzzy Logic, K-Nearest Neighbor (KNN), Nave Bayes, and Support Vector Machine(SVM) are used to predict heart disease. This article consolidates a diagram of the continuous computation and a framework of the past work.

2.3 Machine Learning Classification Techniques for Heart Disease Prediction

Authors: Maryam I. Al-Janabi , Mahmoud H. Qutqut , Mohammad Hijjawi.
Disease diagnosis is the most important work in the healthcare industry. Many lives may be spared if a disease is detected early. Machine learning categorization approaches have the potential to considerably help the medical industry by offering accurate and timely illness diagnosis. As a result, both physicians and patients should save time. Since heart disease is the main source of death in this present reality, it has become one of the most provoking ailments to analyze. We provide an overview of machine learning classification algorithms that have been suggested to assist healthcare practitioners in identifying cardiac disease in this work.

2.4 Big Data Analytics in Heart Attack Prediction
Authors: Lidong Wang
Acute myocardial infarction (heart attack) is quite possibly of the most deadly condition that people might experience the ill effects of. The way to cardiovascular illness is to inspect and mine colossal measures of information for data that might be used to estimate, forestall, make due, and deal with persistent circumstances like coronary episodes. Huge Information examination, notable in the business area for its convenience in controlling, differentiating, and overseeing monstrous datasets, might be effectively used to the expectation, counteraction, the executives, and treatment of cardiovascular sickness. Information mining, representation, and Hadoop are enormous information innovations or strategies used to dig huge data sets for data. The objective of this writing study was to distinguish the use of Large Information examination in respiratory failure expectation and counteraction, the utilization of huge information advancements, patient 7 security issues, issues and future patterns, and thoughts for additional utilization of these innovations.

2.5 Heart Disease Diagnosis and Prediction Using Machine Learning and Data Mining Techniques:
Authors: Animesh Hazra, Subrata Kumar Mandal, Amit Gupta, Arkomita Mukherjee and Asmita Mukherjee
The most common method for turning a lot of information into information is data mining. The medical services industry regularly takes enormous data measurements. Despite this, most of it isn't used at all. There are few effective methods for extracting data from these datasets for different or clinical purposes. This study aims to frame some of the flow research on using information mining to predict heart diseases, examine the various mining calculation mixes used, and determine which methods are useful and effective. Additionally, future headings in expectation frameworks have been considered

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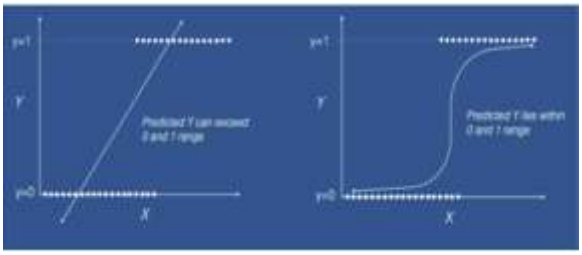
2.6 Predictive data mining to support clinical decisions: An overview of heart disease prediction systems

Authors: Eman Abukhousa and Piers Campbell Healthcare companies have obstacles in providing high-quality, cost-effective patient care. Administrators and physicians must both assess a variety of data accessible in healthcare information system databases in order to acquire knowledge and make educated judgements. This is especially important for improving the efficacy of illness treatment and prevention. It is especially urgent because heart disease (HD) is the leading cause of adult mortality. A method known as "information digging" is used to uncover hidden connections and examples within HD clinical data. Five models designed to aid clinical decision-making in guess and determination are examined in this study. They were developed using a single and consolidated information mining method. The five approaches attempt to establish connections between the various HD measurements and side effects using computerized design acknowledgment. In terms of information type, accuracy, ease of translation, steadfastness, and speculation limit, each framework has its own set of advantages and disadvantages. Due to a lack of information and the significant cost of re-handling, unfortunate speculation limit is extremely challenging for medical care information mining.

3. ALOGRITHMS:

3.1 Linear Regression

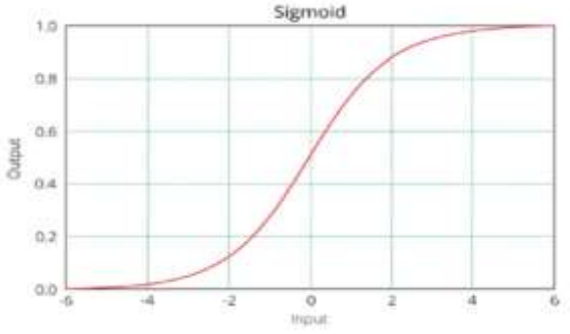
The objective of linear regression is to create a straight association (a mathematical formula) between the indicator variable(s) and the reaction variable so that we can use this equation to gauge the value of the response Y when only the upsides of the indicators (Xs) are known. This is done by anticipating the value of a result variable Y in light of at least one indicator factor (X). The variable forms the basis for the classification



3.2 Logistic Regression

A type of expanded straight model is logistic regression. At the point when the response variable is dichotomous, it is a paired characterization strategy (1 or 0). It returns the arrangement of probabilities of the objective class as a matter of course. Logistic Regression makes the accompanying presumptions:

1. The reaction variable's dissemination should be binomial.
2. Logistic Regression depends with the understanding that the free factors and the connection capability have a direct relationship (logit).
3. The reliant variable's classifications ought to be fundamentally unrelated and thorough.



3.3 Support Vector Machine:

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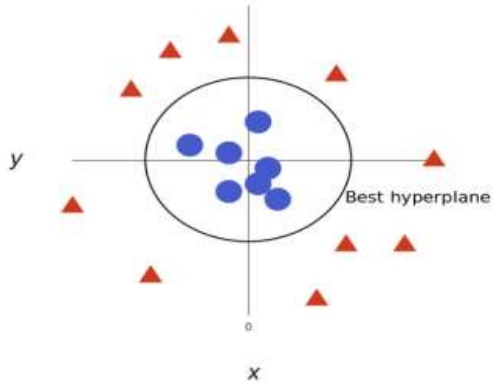
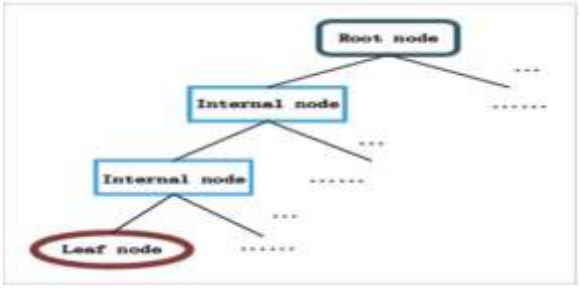
In machine learning, information used for arrangement and relapse examination is examined by support vector machines, which are directed learning models with related learning calculations. Model will assist you with understanding the essentials of Support Vector Machines. However, they are primarily utilized in classification difficulties.

1. Linear Data
2. Non Linear Data



3.4 ID3 (Iterative Dichotomiser 3):

A decision tree is created by ID3 using a predetermined set of cases. The made tree will be used to sort following models. The example belongs to a class and has a variety of properties, such as yes or no. The choice tree's leaf hubs are remembered by the class name, whereas a non-leaf hub is a choice hub. Each branch (to another choice tree) in the choice hub addresses a potential characteristic worth. ID3 uses data acquisition to determine which credits go into a choice hub. Learning a choice tree gives you the advantage of getting data from a specialist rather than an information engineer.



5.EXPERIMENTAL RESULTS

The Algorithm used	Linear regression	Logistic regression	Support Vector machine	ID3
Accuracy (%)	70.67	62.78	69.83	60.67

6.CONCLUSION

We exhibited a Efficient Heart Disease Prediction System Utilizing ML Calculations in this exploration. In view of the provided boundary, this approach might help clinical experts in pursuing wasteful choices. We utilized directed procedures to prepare and test the framework. Because it works reasonably well even without retraining, this model produces improved results and aids region specialists and other related individuals in planning for a common examination and providing the patient with early examination results. We find that, among the four machine learning algorithms tested, the Linear Regression Algorithm provides the best accuracy.

7. REFERENCES

1.M.Marimuthu,M.Abhinaya,K.S.Harish,K.Madankumar andV.Pavithra “Heart Disease Prediction using Machine Learning and Data Analytics Approach”,International Journal of Computer Applications Volume 181-No 18,September 2018,Coimbatore Institute of Technology Coimbatore.

2. Maheswari,Subburaj,Pitchai and Ramu,”Heart Disease Prediction using Decision Tree and Naive Bayes Algorithm,”Bentha

ISSN: 2278-4632
Vol-13, Issue-06, June 2023

Science Publishers,Current Medical Imaging Volume 15,No 8, 2019,pp. 712-717(6).
3. Mangesh Limbitote , Dnyaneshwari Mahajan , Kedar Damkondwar and Pushkar Patil"A Survey on Prediction Techniques of Heart Disease using Machine Learning",Pimpri Chinchwad College of Engineering, Nigdi, Pune 411044, India, Volume 09, Issue 06(June 2020)
4. Avinash Golande, Pavan Kumar T, "Heart Disease Prediction Using Effective Machine Learning Techniques", International Journal of Recent Technology and Engineering, Vol 8, pp.944-950,2019.
5. T.Nagamani, S.Logeswari, B.Gomathy," Heart Disease Prediction using Data Mining with Mapreduce Algorithm", International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN:
2278-3075, Volume-8 Issue-3, January 2019.
6. Fahd Saleh Alotaibi," Implementation of Machine Learning Model to Predict Heart Failure Disease", (IJACSA) International Journal of Advanced Computer Science and Applications, Vol. 10, No. 6, 2019.
7. Anjan Nikhil Repaka, Sai Deepak Ravikanti, Ramya G Franklin, "Design And Implementation Heart Disease Prediction Using Naives Bayesian", International Conference on Trends in Electronics and Information(ICOEI 2019).
8. Theresa Princy R,J. Thomas,'Human heart Disease Prediction System using Data Mining Techniques', International Conference on Circuit Power and Computing Technologies,Bangalore,2016.
9. Nagaraj M Lutimath,Chethan C,Basavaraj S Pol.,'Prediction Of Heart
Disease using Machine Learning', International journal Of Recent Technology and Engineering,8,(2S10), pp 474-477, 2019