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An Efficient Authentication Scheme for Blockchain - Based Electronic Health Records

Jayasudha Subburaj[1], A.Shobana[2], P.Keerthana[3]

[1]Department of Master of Computer Applications , [2]Department of Science and Humanities, [3]Department of

Information Technology
Sri Krishna college of Engineering and Technology, Kuniyamuthur, Coimbatore,Tamil Nadu,India

ABSTRACT

Block chain has long been an important field of science, and its applications have been used in a range of industries. Likewise, because of protection and privacy, the healthcare sector stands immensely from blockchain technology. The data mining technique used is a classification algorithm for security purposes, including the Naïve Bayes algorithm and the use of blockchain technology. This paper compares prediction accuracy when the amount of medical attributes used for prediction is diminished. The proposed decision support system is believed to avoid unnecessary diagnosis test conducted to the patient and the delay in starting appropriate treatment by quickly diagnosing heart disease in a patient. There by it saves both money and time.

KEYWORDS

Blockchain, Health records, Bayes theorem

INTRODUCTION

Heart disease is now one of the world's most significant causes of mortality. In the area of medical data analysis, prediction of cardiovascular ailment is an significant task. Naive Bayes Classifier has proven to be successful in supporting selections and predictions from the large quantity of statistics generated with the aid of the healthcare sector. We have also seen the use of Naive Bayes techniques in the new and unique Internet of Things (IoT) sectors. The model of prediction is de- livered with exceptional combinations of features and numerous category techniques recognized. We deliver an improved overall performance with an accuracy of
88.7% This project aims at addressing this important issue and developing a cloud-based privacy framework that maintains mobile health monitoring systems to protect the privacy of the parties involved and their data using Blockchain.
In addition, the outsourcing decryption strategy and a newly introduced key private proxy re-

encryption and Blockchain was modified to transfer the uncertainty of the parties concerned to the cloud, without sacrificing the privacy of clients and the intellectual property of service providers.

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We have also seen the use of Naive Bayes techniques in the new and unique Internet of Things (IoT) sectors. In this paper, we endorse a novel approach that aims to locate extensive functions by using Naive Bayes techniques that result in improving the accuracy of cardiovascular disorder prediction. Finally, our security and efficiency review shows the efficacy of the cloud computing environment. The healthcare sector experienced a move towards systems designed to merge paper-based medical records with electronic medical records. Such devices have been used to store clinical notes and test reports in their various components. They have been suggested to improve patient safety by reducing mistakes and increasing access to information. The goal of EHR systems was to solve the problems facing the paper-based healthcare records and to provide a system that would change the state of healthcare sector.

LITERATURE SURVEY

NAIVE BAYES CLASSIFIER

Title : Heart disease prediction system based on Naive Bayes classifier
Author : M.A. Jabbar

Description : Coronary heart disease is a major worldwide cause of death. Diagnosing heart disease is a laborious task. An intelligent decision support system for predicting disease is needed. Data mining techniques are often used to figure out whether a patient is normal or cardiac. Hidden Naïve Bayes is a type of data mining, relaxing the standard Naïve Bayes conditional presumption of independence. Our proposed model asserts that the Secret Naïve Bayes (HNB) can be extended to the classification of heart disease (prediction). Our experimental tests on data set for heart disease show that the HNB records 100% accuracy and out performs Naïve bayes.

WEB ANALYTICS

Title **:** Web analytics support system for prediction of heart disease using Naive Bayes Weighted Approach

Author **:** P. Priyanka

Description **:** Data mining is a way to use various techniques to discover styles or to obtain the necessary statistics from the database that can be used in the fields of selection and prediction. Within this study paintings, a smart and efficient tool is analyzed for predicting heart disease using Naïve Bayes modeling process. User must provide the necessary values to the utility attributes that are implemented as a completely network based. The documents are taken from the database and compare the expense of entering educated data with the customer. Traditional systems are unable to detect heart disease properly, but these paintings may help doctors make specific decisions. Naïve Bayes is used to stumble on coronary heart disease for category purposes and this approach classifies performance statistics as no, low, normal, high and very high.

DATA MINING TECHNIQUE

Title **:** Human heart disease prediction using data mining technique

Author **:** J. Thomas

Description : Fitness sickness is rising every day nowadays due to genetic style of life. Especially in these days, coronary heart disease has become more common, i.e. People's lives are at risk. Each person has exclusive Blood strain values, ldl cholesterol and pulse size. But the

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daily values of Blood Stress are a hundred and twenty/90 consistent with medically demonstrated effects, cholesterol is and the pulse price is seventy-two. This paper gives the survey about one kind of classification technique that is used to predict each person's level of danger based on age, gender, blood stress, ldl cholesterol, pulse rate. The patient risk degree is categorized using classification techniques for datamining such as Naïve Bayes, KNN, Decision Tree Algorithm, Neural Network. Etc., Chance level accuracy is unnecessary when using extremely wide variety of attributes.

HEART DISEASE PREDICTION

Title **:** Prediction in heart disease using techniques of data mining
Author **:** Monika Gandhi

Description : As vast numbers of data are generated in medical societies (restoration facilities, focuses on healing) but this statistics are not being used properly. The health care gadget is "wealthy records" but "poor knowledge." A good research techniques for identifying connections and trends in fitness care records are missing. In this situation, data mining methods can help as a remedy. Extraordinary mining records techniques can be applied for this purpose. The paper aims to provide information on different know-how abstraction approaches by using data mining techniques that are being used in today's coronary heart disease prediction studies. In this paper, data mining approaches in particular are explored using algorithms on clinical records units using Naive Bayes, Neural network, Decision tree algorithm.

EXISTING SYSTEM

Existing system dealt with the estimation of KNN based on heart dis- ease. The findings indicate that the method proposed could significantly improve the quality of the learning. It also presents a significant privacy danger to customers. The performance depends on whether the classification or regression of k-NN is used. Remote mobile health monitoring has been identified as not just a possible track. It also presents a significant risk to the privacy of customers.

DISADVANTAGES OF EXISTING SYSTEM:

- Need to determine parameter value K.
- Distance-based learning is not transparent about what kind of distance to use to produce the best results.
- Computational costs are high because we need to measure the distance to all training samples from each question instance.
- Heavy demand for memory
- Store all instruction data

PROPOSED SYSTEM:

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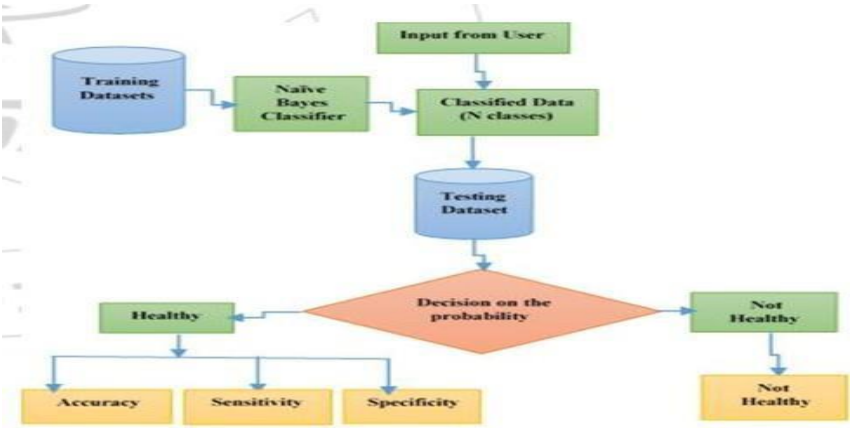
The proposed method uses Naïve Bayes classification technique for data mining to construct the prediction method. Naïve Bayes classifiers use the likelihood to find an unknown (unclassified) instance's most probable classification. Protect the privacy and information of the parties concerned. Using Blockchain Technology. It maintains Blockchain and mobile health tracking system used to protect the privacy and details of the parties concerned. We will be having all user feedback results. Then use NB (Naive Bayes) classifier to predict all the input values. Report in PDF format will be created after predicting result. As well as the doctor will forecast all user data using regression model, the doctor will be able to say about all the end result as True Positive, True Negative, False Positive and False Negative.We take over all analytical information of the given inputs using that.

ADVANTAGES OF PROPOSED SYSTEM:

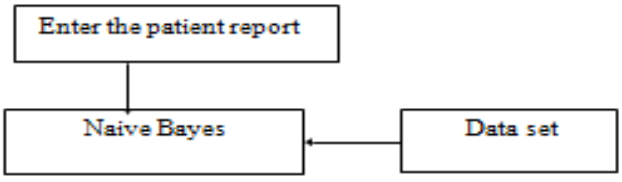
- The illness which should be more accurately predicted
- Based on technology Blockchain preserves the privacy of the parties concerned.
- The cost of seeing the doctor at the initial stage may be prevented, because the drugs are prescribed.
- Efficiently protect client privacy and offer intellectual property to providers of health care.

SYSTEM DESIGN ARCHITECTURE:



DATA FLOW DIAGRAM:

Level:0



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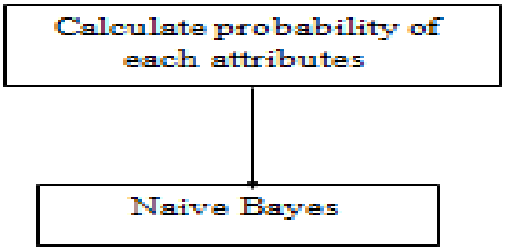
Level: 1



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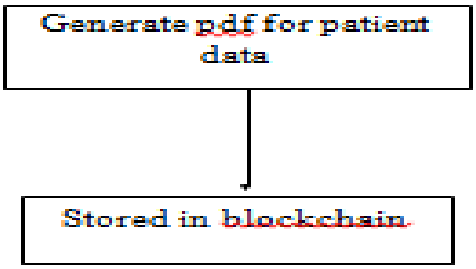

ALGORITHM EXPLANATION

BAYES THEOREM:

Bayes theorem is one way to work out conditional probability. The probability of an occurrence that has some relationship to one or more other events is conditional

For example, the chance of having a car park is related to the time of the day you park, where you park, and what conventions are going on at that moment. The rule
for Bayes is a little more complex.

- Probability of green=40/60
- Probability of red=20/60

The technique of the Naive Bayes Classifier is called the Bayesian theorem, and is especially suited if the input dimensions are small. Despite its simplicity, Naive Bayes can often outperform more sophisticated classification methods. Having formulated our prior probability, classify a new object.

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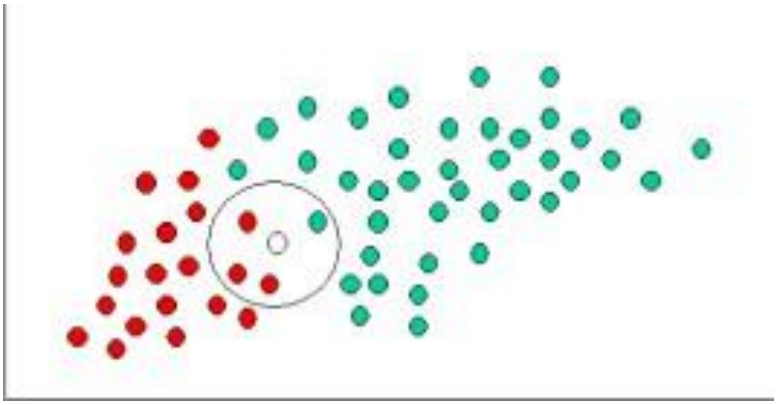
$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$



$$Posterior\ probability\ of\ X\ being\ GREEN \propto$$
$$Prior\ probability\ of\ GREEN \times Likelihood\ of\ X\ given\ GREEN$$
$$= \frac{4}{6} \times \frac{1}{40} = \frac{1}{60}$$
$$Posterior\ probability\ of\ X\ being\ RED \propto$$
$$Prior\ probability\ of\ RED \times Likelihood\ of\ X\ given\ RED$$
$$= \frac{2}{6} \times \frac{3}{20} = \frac{1}{20}$$

$$Likelihood\ of\ X\ given\ GREEN \propto \frac{Number\ of\ GREEN\ in\ the\ vicinity\ of\ X}{Total\ number\ of\ GREEN\ cases}$$

$$Likelihood\ of\ X\ given\ RED \propto \frac{Number\ of\ RED\ in\ the\ vicinity\ of\ X}{Total\ number\ of\ RED\ cases}$$

$$Probability\ of\ X\ given\ RED \propto \frac{3}{20}$$

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$$Probability\ of\ X\ given\ GREEN \propto \frac{1}{40}$$

MODULE DESCRIPTION REGISTRATION:

In this Registration module, the user registers by entering user information for their accounts, such as user name, password and confirmation password, and other information. To login, they use the user name and password to access additional details.

HEART DISEASE PREDICTION:

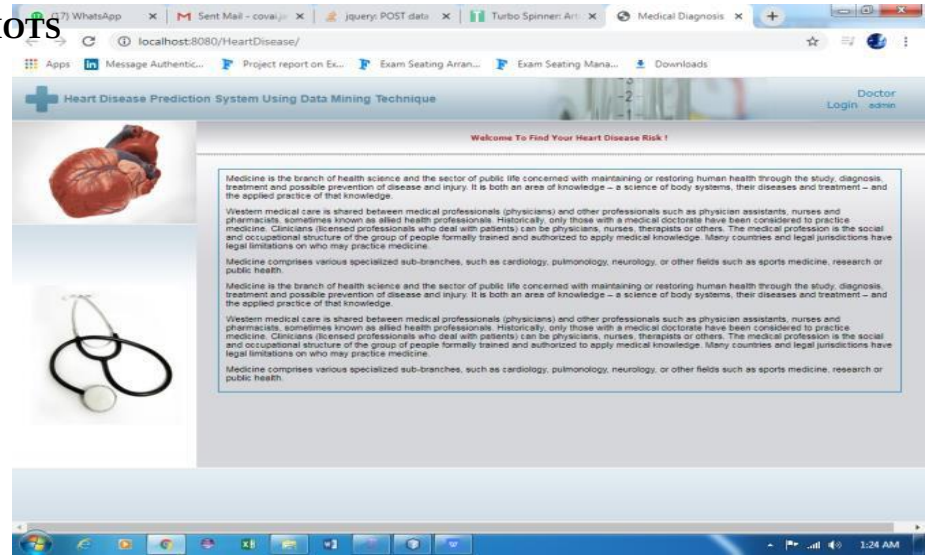
All input results will be collected from users. Then we predict all input values using NB (Naive Bayes) Classifier. After predicting the result will produce report in PDF. According to patient details the block chain was developed. Each block that is connected to the user report and the information they need. Hence the block preserves certain theses. The block displays the report at any time from anywhere when the user requirement is required.

MEDICAL DETAILS STORED IN BLOCKCHAIN:

The module specifies that by storing the data into the Blockchain, the user report and the medical information are kept. The Blockchain includes documents such as the results of the case; the Blockchain is connected to pharmacy prescription, doctor status report, patient health insurance and other medical information.

- Create a simple wallet.
- Send signed transactions using our Blockchain.
- Feel extra cool.

SCREENSHOTS



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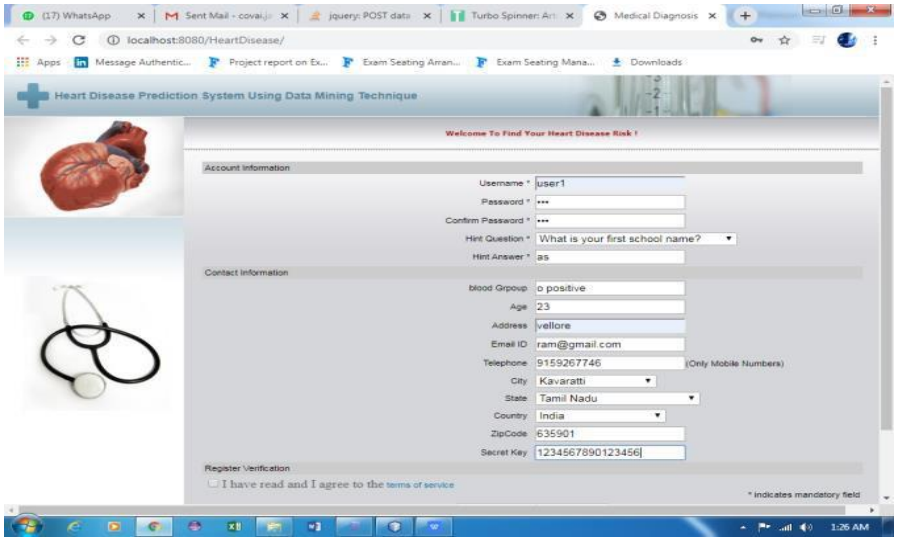
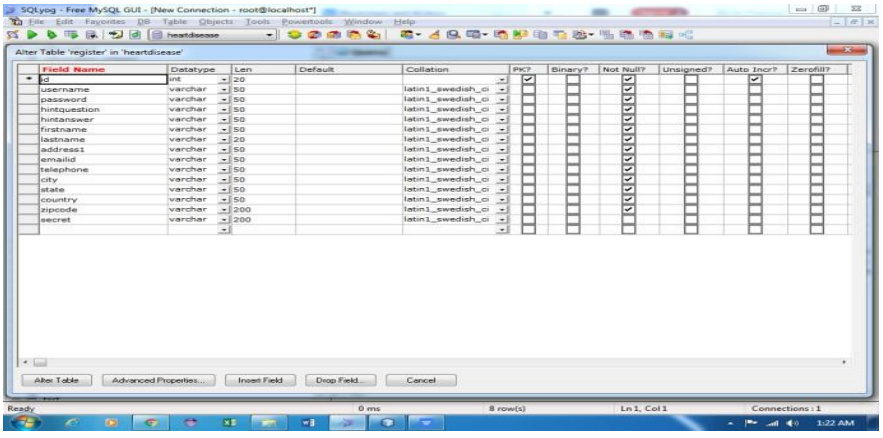
HOME PAGE



SIGNUP PAGE



LOGIN DATABASE

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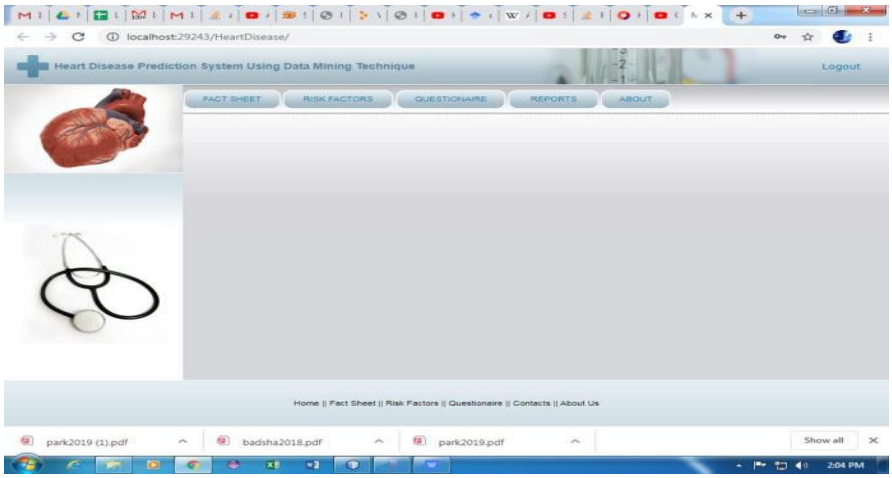

HEART DISEASE PREDICTION

CONCLUSION

In this paper we used HNB classifier for heart disease diagnosis. For heart stalog data set we applied HNB and checked performance. Experimental findings show that the HNB model has a higher performance compared to other methods. The proposed solution applies discretization and IQR filters to boost Hidden naïve bayes' performance.

Compared with the NB classification model, the proposed model achieved highest accuracy (100 per cent). HNB model assists in reliable decision support system (DSS) for automatic disease diagnosis.

FUTURE WORK

For the future, an additional objective of this study was to enable a controlled sharing of the in-training obtained with the patient caregiver by taking advantage of the social networking paradigm. Our future work includes the further development of methodologies for handling user-based contextual data behaviors and appropriate methods for collaborative filtering. In particular, we aim to investigate ways in which the user can provide information about the activity, rather than requiring.

REFERENCES:

[1] M.A.Jabbar,"Heart Disease Prediction System using Associative Classification and Genetic Algorithm", ICECIT, pp 183-192, Elsevier, vol 1(2012)

[2] M.A.Jabbar et.al" Prediction of heart disease using Random forest and Feature subset selection ",AISC SPRINGER, vol 424,pp187-19M.A.Jabbar, " Classification of heart disease using artificial neural network and feature subset selection", GJCST, Volume 13 Issue 3 , Ver 1.0, 15-

ISSN: 2233-7857 IJFGCN

25,(2013)

[3] Helge Langseth,“ Classification using hierarchical naive Bayesian models”, Machine learning, pp 135-
159,63(2)(2006)

[4] Liangxiao, jiang, harry zhang, zhihua cai, ”novel bayes model: Hidden naïve bayes” IEEE Transactions on knowledge and data engineering”,vol 21,no 10, (2009)

[5] Domingos,” A general method for making classifiers” Proc of fifth Intl. Conf, KDD, pp 155-164 (1999)

[6] M.A. Jabbar,” Computational intelligence technique for early diagnosis of heart disease”, ICETECH 2015, IEEE, pp1- 6(2015)

[7] Sreejith,Rahul jisha,” patient monitoring system for disease prediction using random forest”, AISC, pp
485- 500(2016)

[8] M.A.Jabbar,” classification of Heart Disease Using K- Nearest Neighbor and Genetic lgorithm “, Procedia technology, pp 85-94 (2013)

[9] J Yaguang J,Songnan, yafend,”A novel bayes model: Package hidden naïve bayes” ,ITAIC, pp 20-22(2011) [11] Kohavi,” Scaling up the accuracy of
NB classifiers: A decision tree hybrid”, In Proc.KDD
1996, pp 202-207(1996)

ISSN: 2233-7857 IJFGCN