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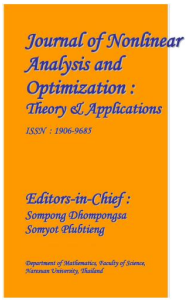


LIVER DISEASE PREDICTION USING MACHINE LEARNING AND DEEP LEARNING

Mr.Ch.Aravind Kumar, *Assistant professor CSE, Vaagdevi College of Engineering(Autonomous),India*

Karre Mounasri ,*UG Student ,CSE, Vaagdevi College of Engineering(Autonomous),India*

Kollam varun kumar ,*UG Student ,CSE, Vaagdevi College of Engineering(Autonomous),India*

Mohamad Adnan ,*UG Student ,CSE, Vaagdevi College of Engineering(Autonomous),India*

Pothula Navyasree ,*UG Student ,CSE, Vaagdevi College of Engineering(Autonomous),India*

ABSTRACT

Recently liver diseases are becoming most lethal disorder in a number of countries. The count of patients with liver disorder has been going up because of alcohol intake, breathing of harmful gases, and consumption of food which is spoiled and drugs. Liver patient data sets are being studied for the purpose of developing classification models to predict liver disorder. This data set was used to implement prediction and classification algorithms which in turn reduces the workload on doctors.The data set used in this paper is Liver Patient taken from UCI Repository (i.e. Supervised Learning). There is a plenty of data on patients undergoing medical examination at hospitals and these data has been extracted on liver patients whose information can be further used for future improvement of their conditions. In other words, historical and classified input of patients and

output data is fed into various algorithms or classifiers for predicting the future data of patients. In this work, we proposed apply machine learning and deep learning algorithms to check the entire patient's liver disorder.The algorithms used here for predicting liver patients are Decision Tree, KNNeighbor and Artifical Neural Network. Based on the analysis and result calculations, it was found that these algorithm has obtained good accuracy after feature selection. A Decision Tree boasts remarkable accuracy at 99.96%, leading the pack in precise liver disease predictions. Meanwhile, the KNearestNeighbour model follows closely at 97.42%, with Artificial Neural Networks achieving 71.55% accuracy, offering diverse options for predictive analysis.

1.INTRODUCTION

The liver is the most imperative structure in a human build. Insulin is broken down by the liver. The liver breaks bilirubin with glucuronidation, which further helps its defecation into bile [1]. It is also accountable for the breaking down and excretion of many unwanted products. It shows a noteworthy role in altering toxic materials. It shows a noteworthy role in collapsing medicinal products. It's named Drug metabolism. The weight would be 1.3 kg. The liver consists of 2 immense portions namely the privileged portion, and the left estimate. The gallbladder is located below the liver, near the pancreas. The Liver along with these organs helps to consume and give nutrition. Its job is to help the flow of the wounding materials in the stream of blood from the stomach, before passing it to whatsoever is left of the body. Liver sicknesses are triggered when the working of the liver is affected or any injury has happened to it [2]. The development of liver disorders [3] is complicated and varied in character, influenced by a number of variables that determine disease susceptibility. Sex, ethnicity, genetics,

environmental exposures (viruses, alcohol, nutrition, and chemicals), body mass index (BMI), and coexisting diseases like diabetes are among them. A high mortality rate is associated with liver problems, which are life-threatening diseases. The usual urine and blood tests are the first step in the prognosis of liver disorders. A LFT (liver functions test) is recommended for the patient based on the symptoms seen [4]. Liver disease is a significant health issue affecting millions of people globally. Early detection and accurate classification of liver diseases can lead to better patient outcomes and reduce the burden on the healthcare system. One-third of adults and an increasing proportion of youngsters in affluent nations suffer from non-alcoholic fatty liver disease (NAFLD) [5], a growing health issue. The abnormal buildup of triglycerides in the liver, which in some people causes an inflammatory reaction that can lead to cirrhosis and liver cancer, is the first sign of the condition. While there is a significant correlation between obesity, insulin resistance, and non-alcoholic fatty liver disease (NAFLD), the pathophysiology of NAFLD remains poorly understood, and treatment options are limited. However, machine learning techniques have demonstrated encouraging results in predicting and categorizing liver diseases based on patient data. By utilizing sophisticated algorithms to analyze and learn from large datasets, these techniques can identify patterns and anticipate outcomes. The employment of machine learning techniques in liver disease prediction and classification is a dynamic area of research, with continual advancements being made to enhance accuracy and decrease healthcare costs.

2.LITERATURE SURVEY

Nonalcoholic fatty liver disease (NAFLD) presents a wide range of pathological conditions, varying from nonalcoholic steatohepatitis (NASH) to cirrhosis and hepatocellular carcinoma (HCC). Their prevalence is

characterized by increased fat accumulation and hepatocellular ballooning. They have become a cause of concern among physicians and engineers, as significant implications tend to occur regarding their accurate diagnosis and treatment. Although magnetic resonance, ultrasonography and other noninvasive methods can reveal the presence of NAFLD, image quantitative interpretation through histology has become the gold standard in clinical examinations. The proposed work introduces a fully automated diagnostic tool, taking into account the high discrimination capability of histological findings in liver biopsy images. The developed methodology is based on deep supervised learning and image analysis techniques, with the determination of an efficient convolutional neural network (CNN) architecture, performing eventually a classification accuracy of 95%.

The utilization of medicinal datasets has pulled in the consideration of specialists around the world. Machine Learning methods have been broadly utilized as a part of creating choice emotionally supportive networks for ailments forecast through an arrangement of therapeutic datasets. Grouping systems have been broadly utilized as a part of the restorative field for exact order than an individual classifier. Liver malady (additionally called hepatic infection) is a sort of harm to or illness of the liver. There are in excess of a hundred various types of liver ailment. In this task, I have taken the datasets of general Indian liver ailment patient's records to help basic leadership. Indian Liver Patient's datasets demonstrate that proposed technique amazingly enhances the illnesses expectation precision.

Machine learning (ML) utilizes artificial intelligence to generate predictive models efficiently and more effectively than conventional methods through detection of hidden patterns within large data sets. With this in mind, there are several areas within hepatology where these methods can be applied. In

this review, we examine the literature pertaining to machine learning in hepatology and liver transplant medicine. We provide an overview of the strengths and limitations of ML tools and their potential applications to both clinical and molecular data in hepatology. ML has been applied to various types of data in liver disease research, including clinical, demographic, molecular, radiological, and pathological data. We anticipate that use of ML tools to generate predictive algorithms will change the face of clinical practice in hepatology and transplantation. This review will provide readers with the opportunity to learn about the ML tools available and potential applications to questions of interest in hepatology.

Liver Diseases account for over 2.4% of Indian deaths per annum. [14] Liver disease is also difficult to diagnose in the early stages owing to subtle symptoms. Often the symptoms become apparent when it is too late. [1] This paper aims to improve diagnosis of liver diseases by exploring 2 methods of identification-patient parameters and genome expression. The paper also discusses the computational algorithms that can be used in the aforementioned methodology and lists demerits. It proposes methods to improve the efficiency of these algorithms.

Nonalcoholic fatty liver disease (NAFLD) is a burgeoning health problem that affects one-third of adults and an increasing number of children in developed countries. The disease begins with the aberrant accumulation of triglyceride in the liver, which in some individuals elicits an inflammatory response that can progress to cirrhosis and liver cancer. Although NAFLD is strongly associated with obesity and insulin resistance, its pathogenesis remains poorly understood, and therapeutic options are limited. Here, we discuss recent mechanistic insights into NAFLD, focusing primarily on those that have emerged from human genetic and metabolic studies.

3. PROBLEM STATEMENT

In the existing system, different classifiers were implemented on liver patient diseases dataset to predict liver diseases based on developed software. Dataset was processed and implemented on WEKA tool using feature selection techniques with 10-fold cross validation testing option. The results of the proposed work were compared using feature selection and without using feature selection techniques after the implementation of different classifiers in terms of execution time and accuracy. During the research work the result of other parameters like kappa statistic, correctly classified instances, and mean absolute error were also compared on liver patient diseases dataset.

3.1.LIMITATION

- Accuracy is very less using weka tool.
- It take more time to compare and classification of diseases.

4. PROPOSED SYSTEM:

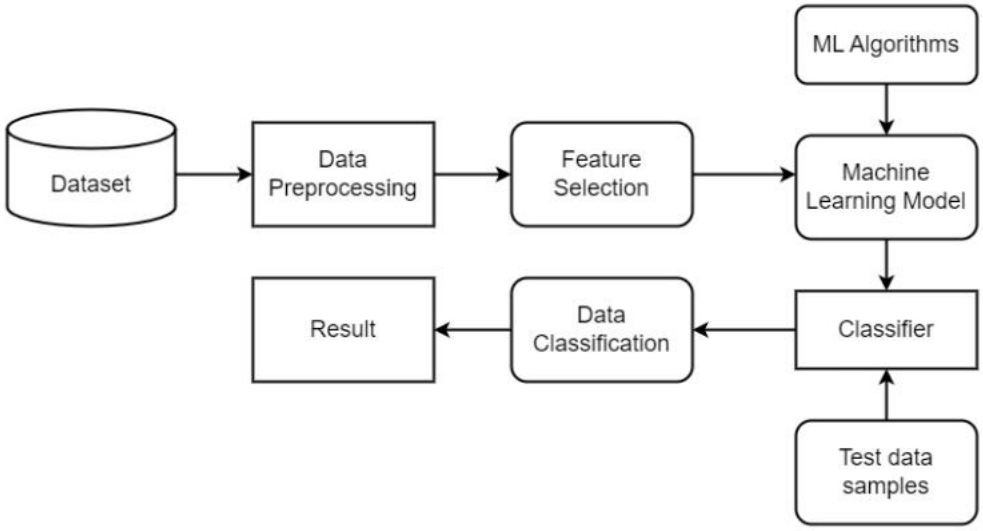
In the proposed system, we have to import the liver patient dataset (.csv). Then the dataset is pre-processed and the anomalies and full-up empty cells in the dataset are removed, so that we can further improve the effective liver disease prediction. Then we construct a Confusion matrix for accomplishing an enhanced lucidity of the no of correct/incorrect predictions. Formerly, several classification and prediction procedures and if possible, combinations of different algorithms are implemented and check the accuracy.

4.1 ADVANTAGES OF PROPOSED SYSTEM:

The advantages are improved classification, early prediction of risks, and improved accuracy.

A Decision Tree boasts remarkable accuracy at 99.96%, leading the pack in precise liver disease predictions

5. SYSTEM ARCHITECTURE:



6. IMPLEMENTATION:

Admin:

Login: In this module, admin will login through username and password.

Upload Dataset : Liver disease dataset (.csv) uploaded successfully.

Data Preprocess : Preprocessed liver disease dataset ready for analysis.

Decision Tree : Model is build and achieved 99.96% accuracy.

KNearestNeighbour : Model is build and achieved 97.42 % accuracy.

Artificial Neural Network : Model is build and achieved 71.55% accuracy.

Comparison: View the accuracy results of Algorithms.

Logout: Log out of the admin account.

User:

Register: Sign up for a new account.

Login: In this module, user will login through username and password.

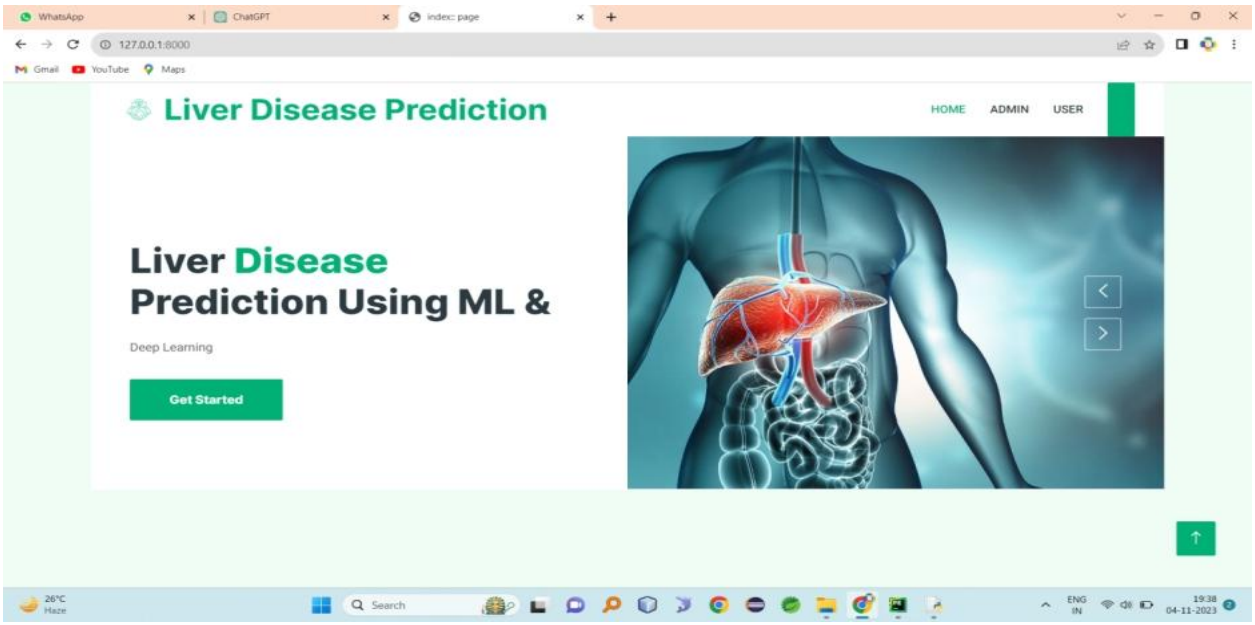
View Profile: In this module, user can see profile information.

Predict Liver Disease: In this module, user can predict result using patient data.

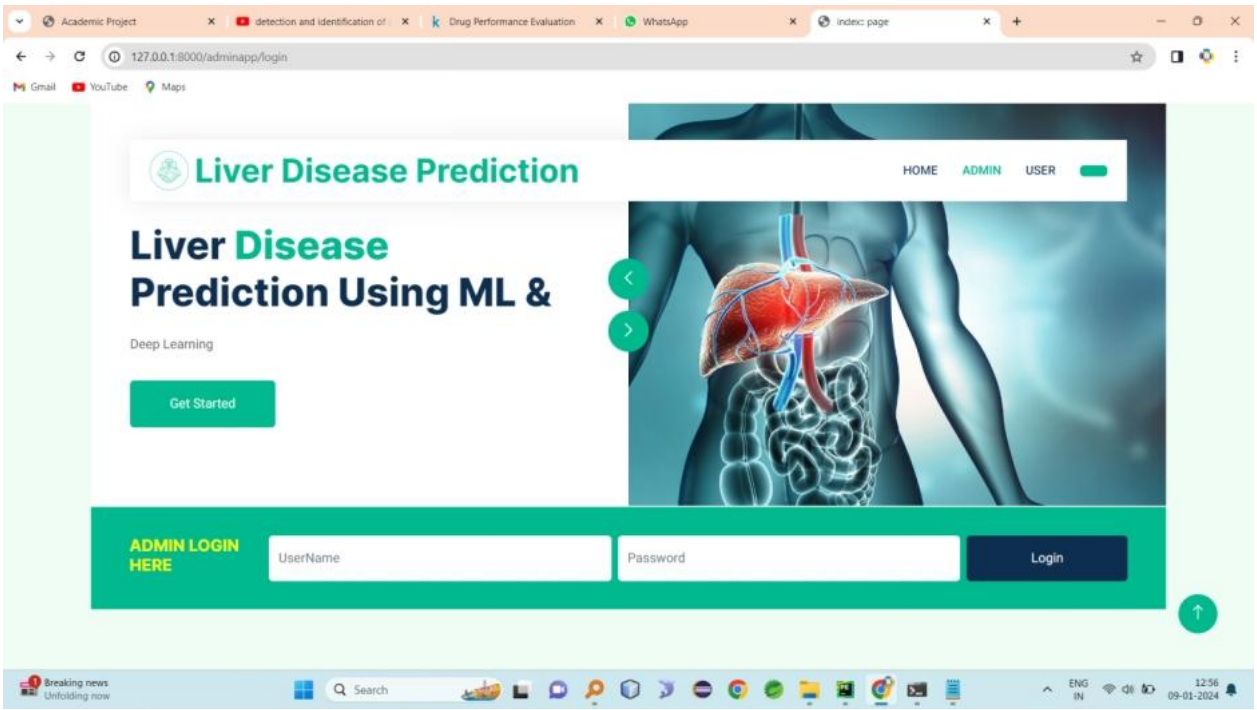
Logout: In this module, Logout of the account.

7. EXPECTED OUTCOMES

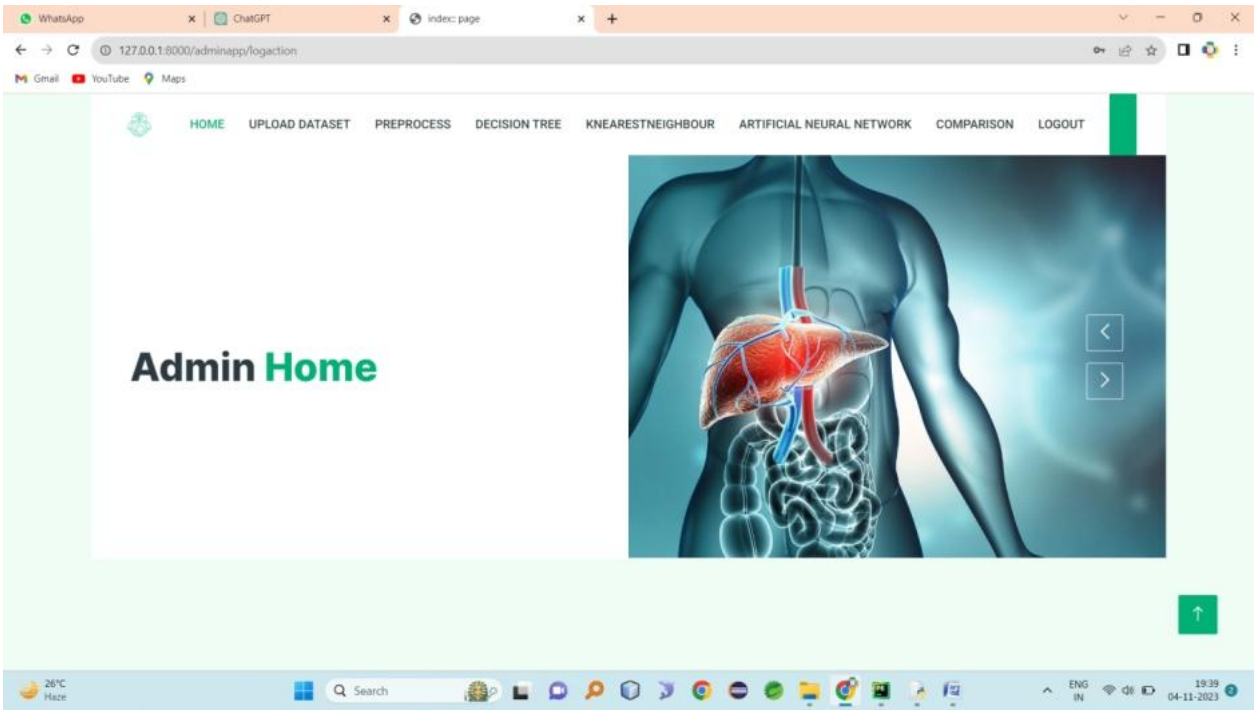
INDEX



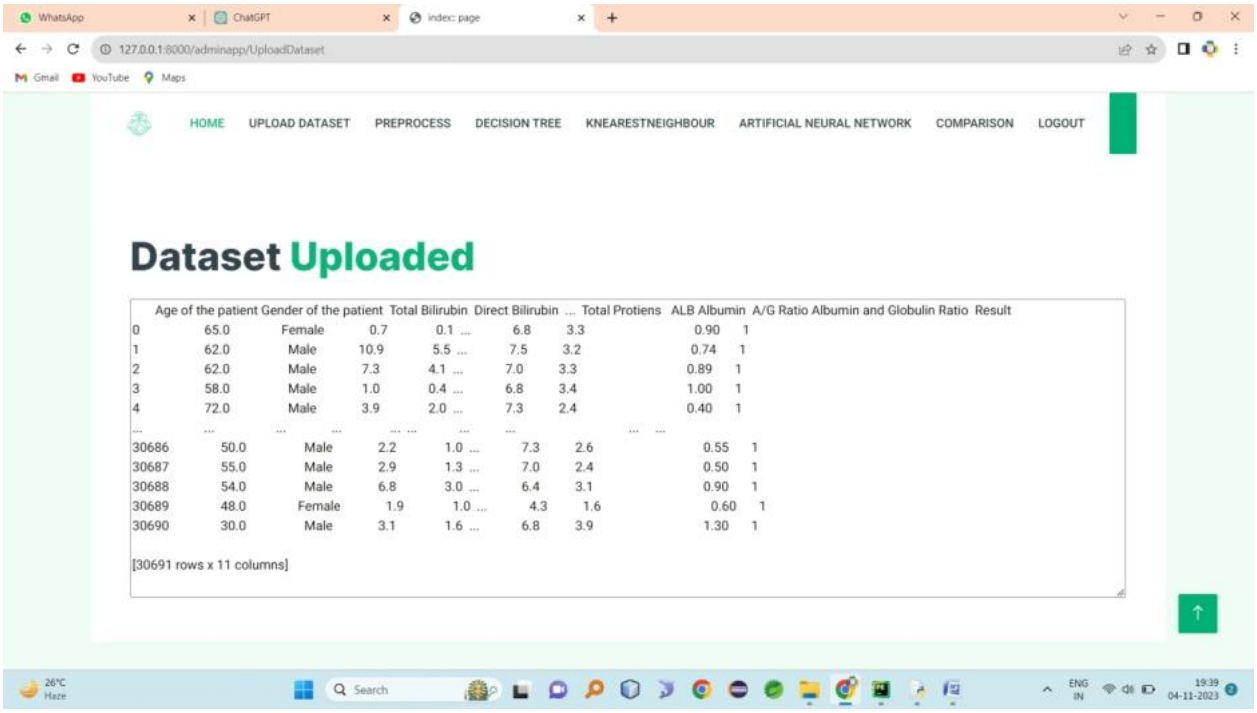
Admin login



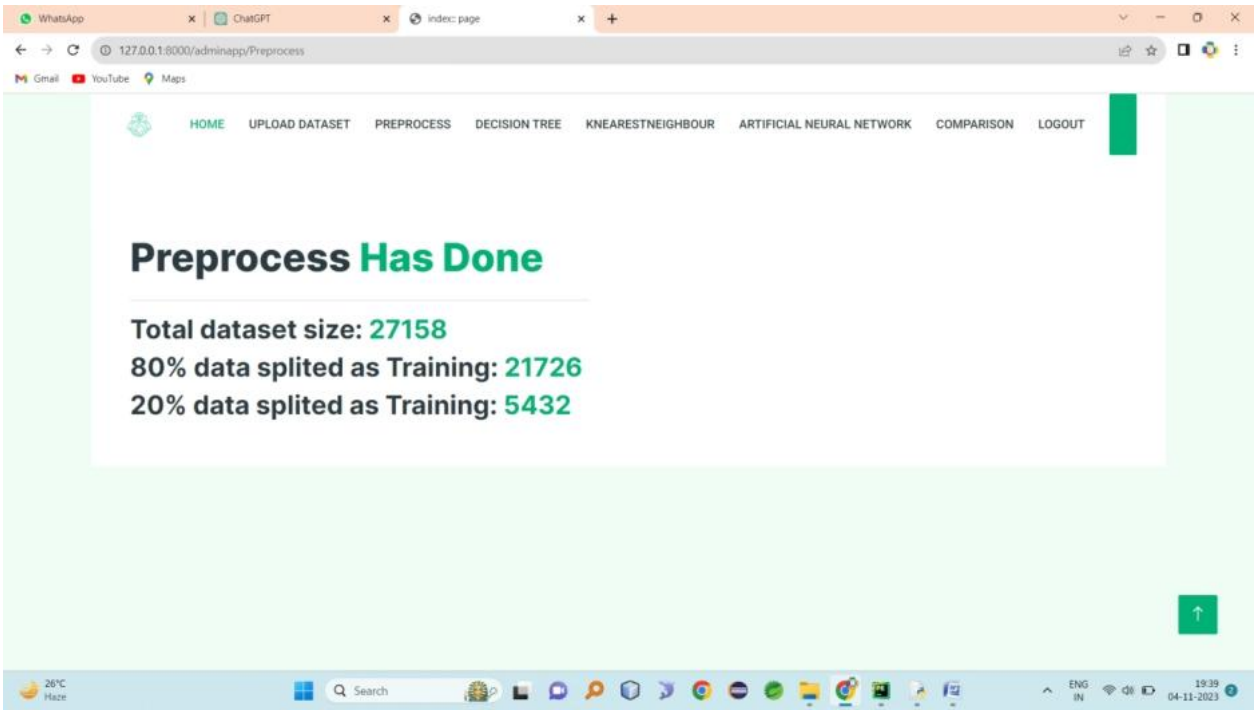
Admin home



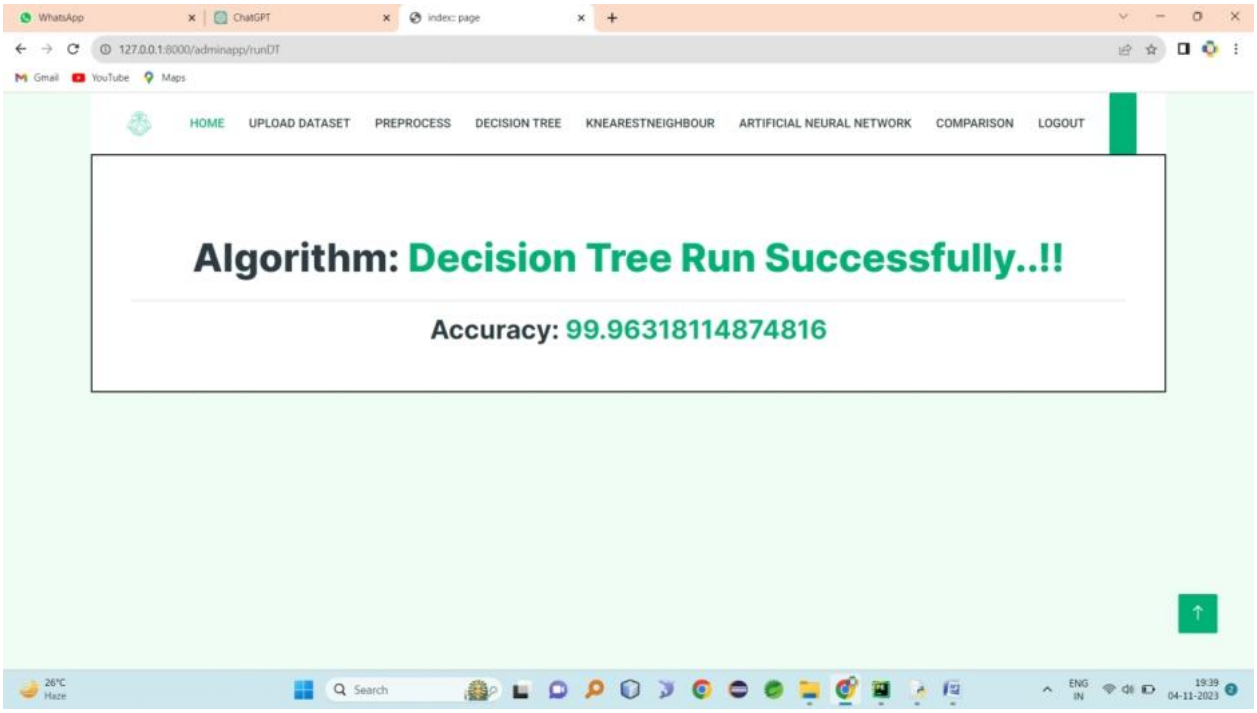
Upload dataset



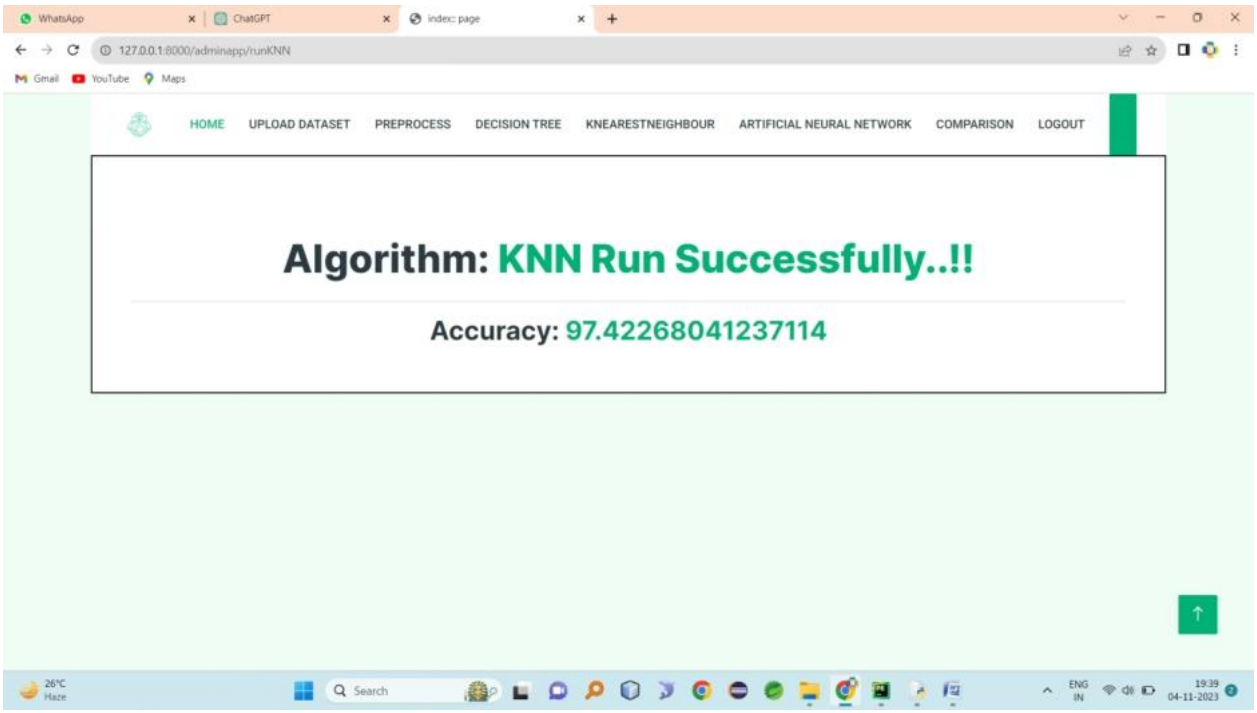
Preprocess



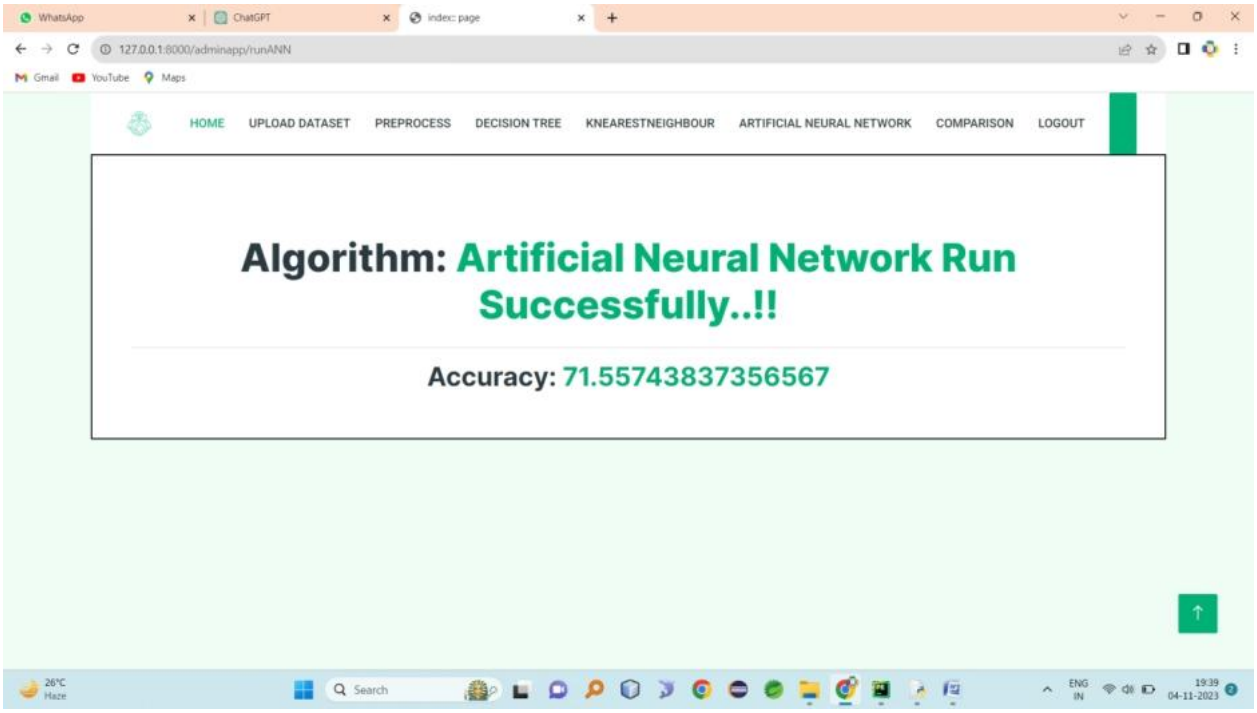
Decision tree accuracy



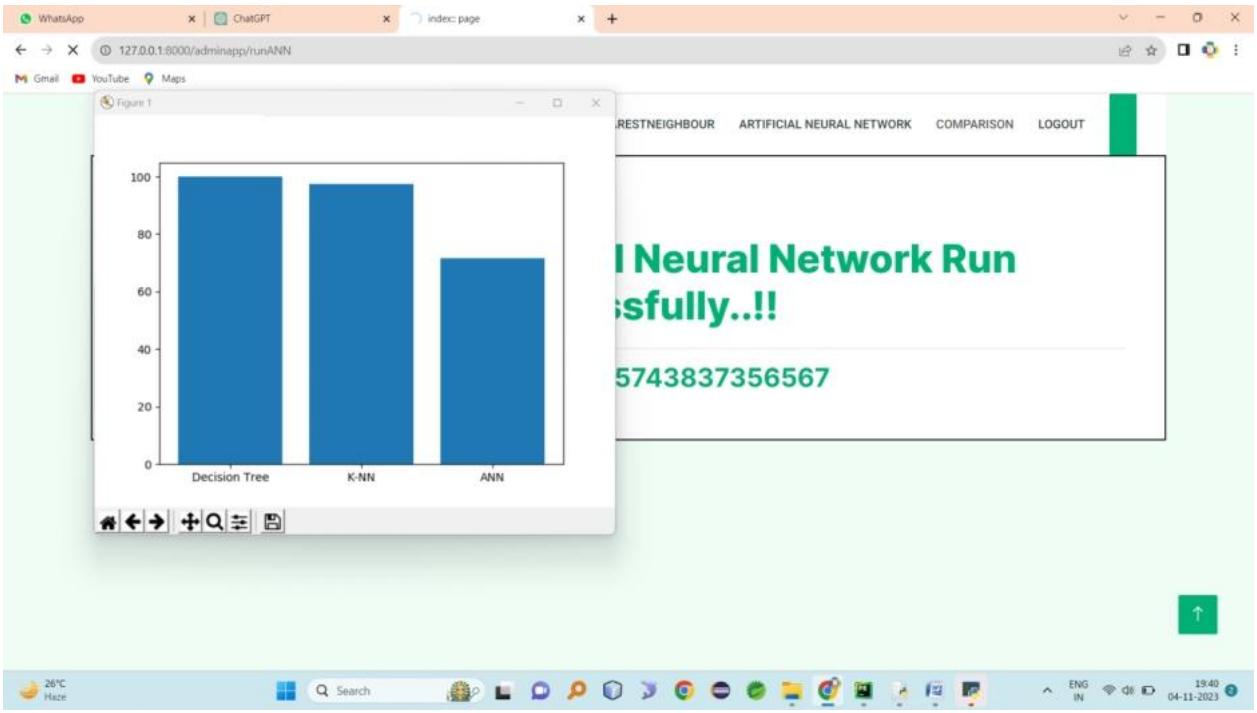
Knn accuracy



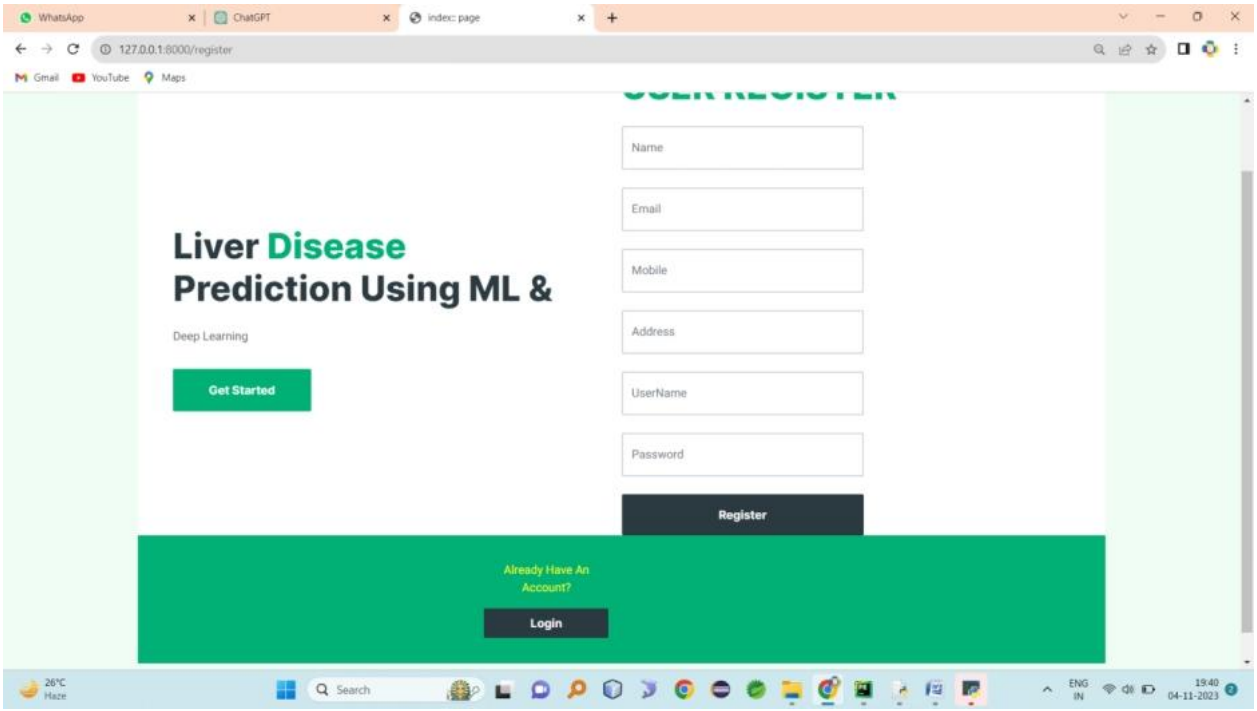
Ann accuracy



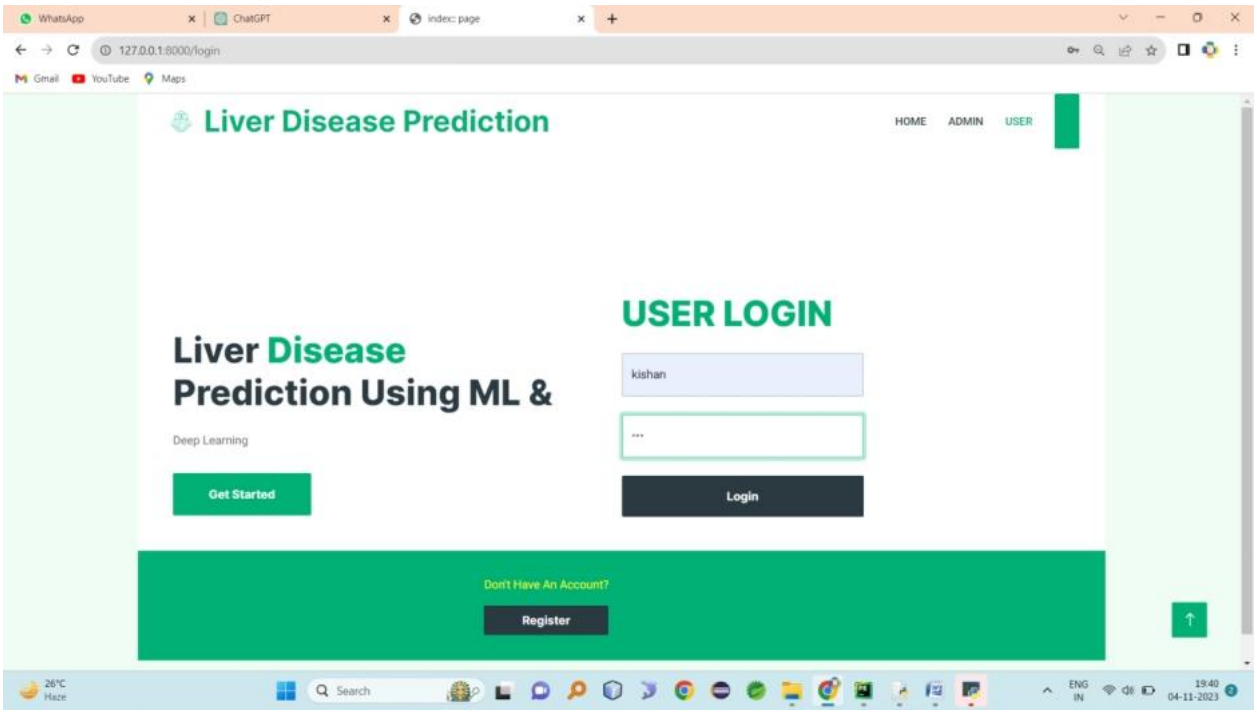
Comparision graph



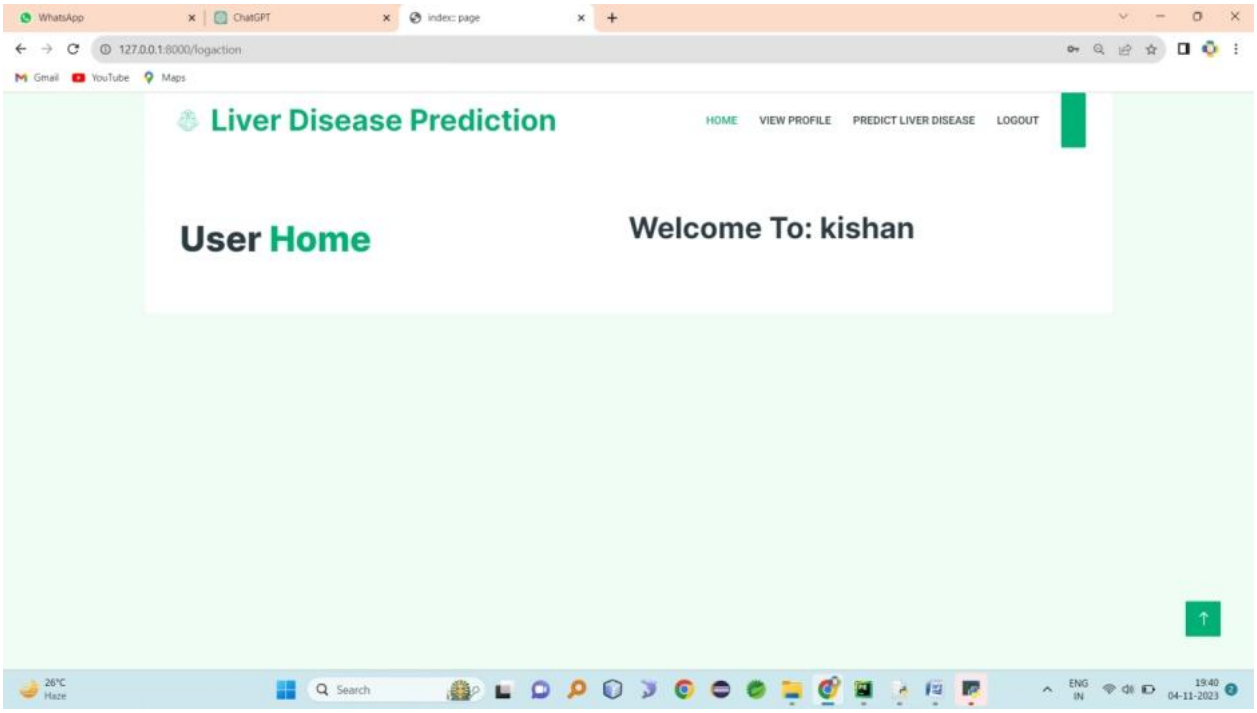
User registration



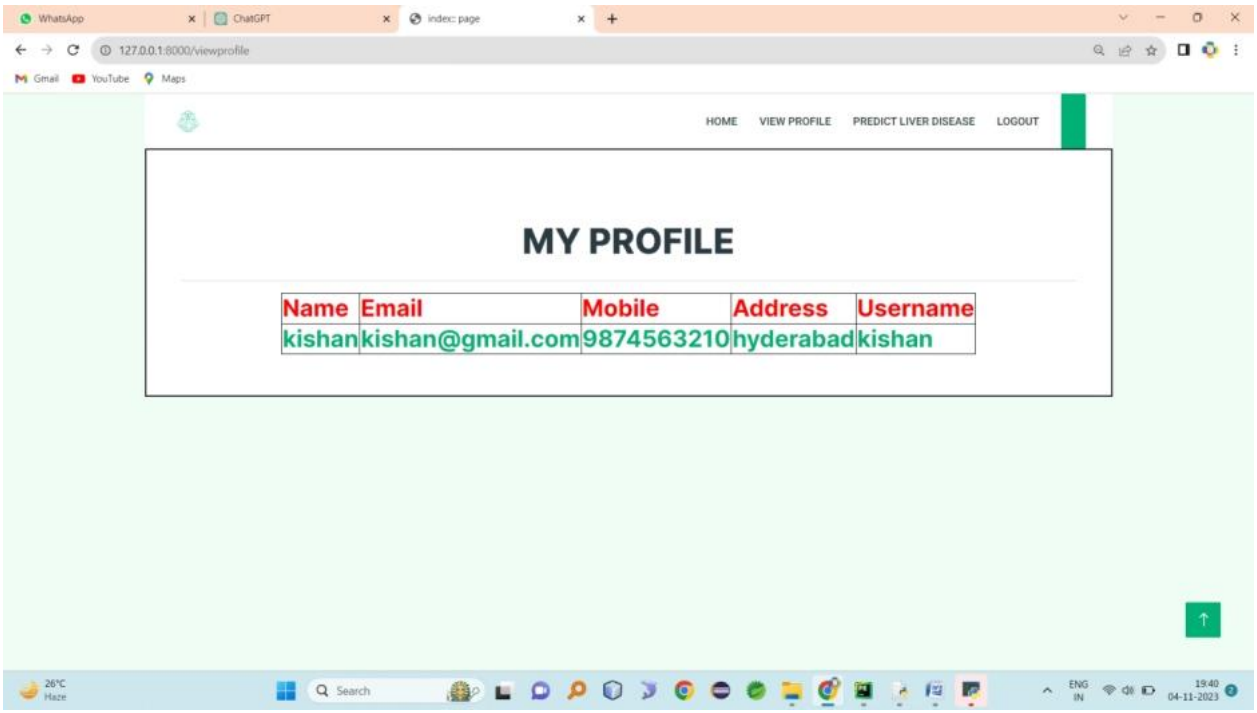
Login



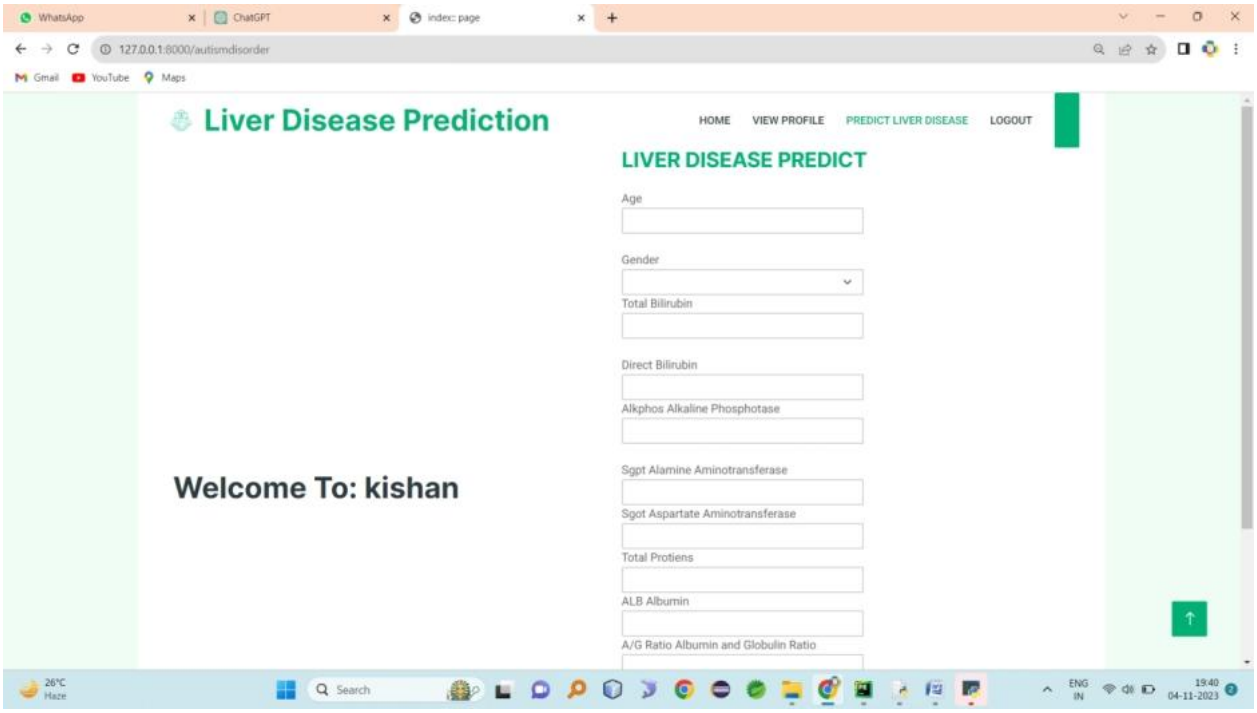
Userhome

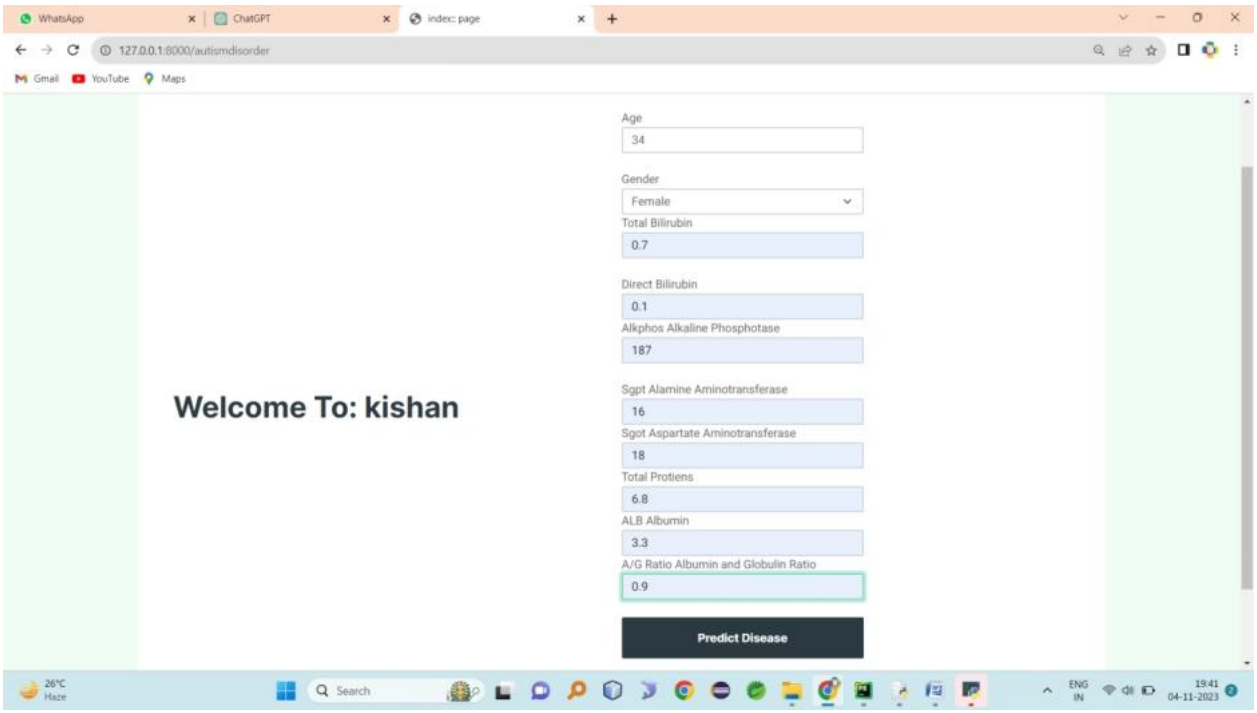


View profile



Predict disease

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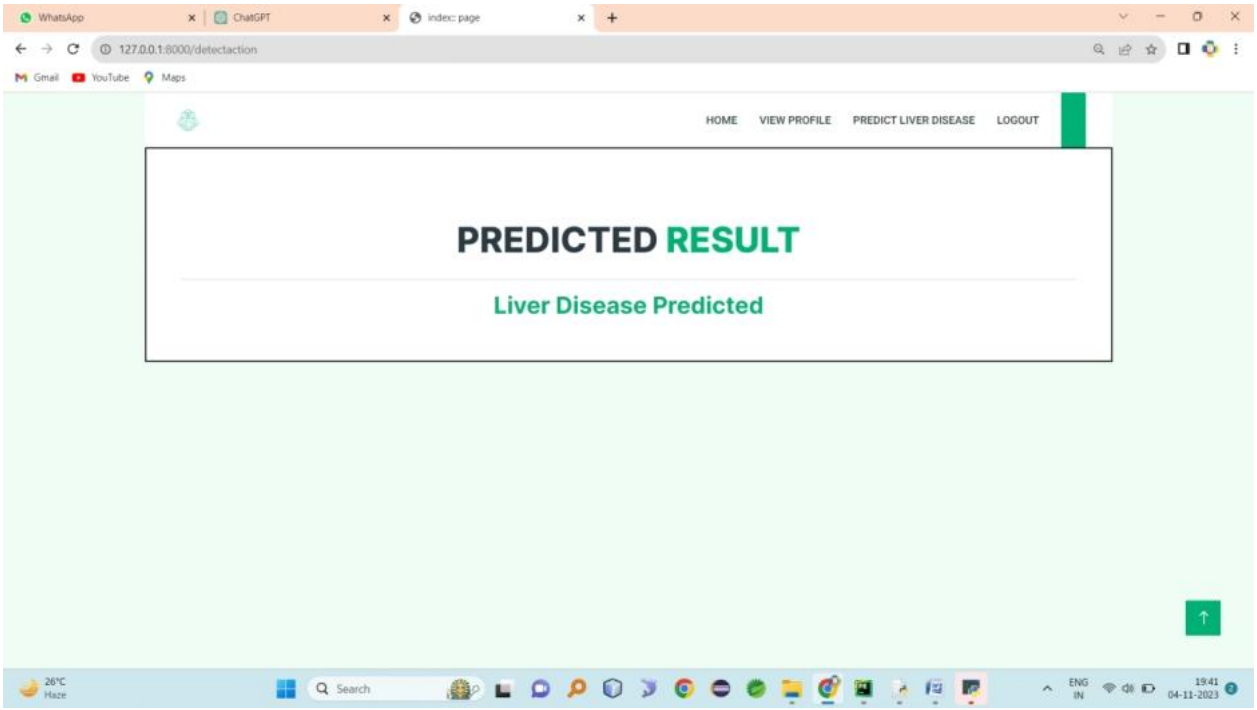
Predict Disease
Search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Gmail
YouTube
Maps
HOME
VIEW PROFILE
PREDICT LIVER DISEASE
LOGOUT
PREDICTED RESULT
Liver Disease Predicted
Search

8. CONCLUSION

The Prediction of liver illness in patients has been examined and analysed in this paper. By using various techniques the data has been cleaned by imputation of missing values with median, then dummy encoding is applied followed by outlier eliminated to improve the performance. In this research paper, various classification algorithm have been applied such as Decision Tree, KNNeighbor and Artifical Neural Network Based on algorithm applied, it is observed that models Decision Tree, KNNeighbor algorithm gives better accuracy than the other classification algorithm. Therefore concluding that Decision Tree is appropriate for predicting liver disease. When a training data set is available, our proposed classification schemes can significantly enhance classification performance. Then, using a machine learning classifier, good and bad values are classified. Thus, the outputs of the proposed classification model show accuracy in predicting the result.

8.1 FUTURE ENHANCEMENT:

The extent of our work is that we will apply deep learning techniques to predict liver disease. Some of the future directions are improve the accuracy of liver disease prediction and classification models is to include more diverse data sources, improving liver disease prediction and classification is to combine multiple machine learning techniques, machine learning models can be trained to predict the likelihood of liver disease in individuals based on their unique characteristics. Another important direction in liver disease prediction and classification using machine learning is to develop models that are explainable. This means that the models should provide clear and interpretable insights into the factors that contribute to liver disease. Explainable models can help

healthcare professionals to make better decisions and provide better care for patients.

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