PROPOSED SOLUTION

Date	24.09.2022
Team ID	PNT2022TMID04221
Project Name	Statistical Machine Learning Approaches to Liver Disease Prediction
Maximum marks	2 Marks
Team Members	Anupama Jeyashree S Lavanya M Anithashree V Parvathi Priya Nandana K M

S. No	Parameter	Description
1.	Problem statement	Around 2 million people die from liver diseases each year in the world, including 1 million from cirrhosis complications, 1 million from viral hepatitis, and 1 million from hepatocellular carcinoma. A liver performs many metabolic functions, including nutrient processing and distribution. Every one in ten people get affected by liver diseases due to the adverse effects of drugs or autoimmune reactions. Common liver infections are cirrhosis, liver cancer, Wilson disease, hepatitis A and B. Acute hepatitis continues to be largely caused by drug-induced liver injury, while viral hepatitis remains highly prevalent.

2.	Idea description	Due to this, it is necessary to deal with this issue in advance. In order to avoid the loss of life due to liver diseases, early detection is crucial. Technological advances have led to many applications that predict liver diseases in different technical fields. However, there are no applications that provide the most accurate results.
		Therefore, the goal of the project is to identify liver disease in patients by taking list of age, proteins, and enzymes into consideration. The main model will be developed using various statistical algorithms and will be attached with web application to provide accurate results to the patients. Using certain datasets, the model will be trained with algorithms, and it will be processed to predict the type of liver disease.
3.	Novelty / uniqueness	The objective of this project is to determine the best algorithm for determining liver disease at an early stage by considering the values of different machine learning algorithms and analysing their results. Considering those machine learning algorithms like Naïve Bayes, K-Nearest Neighbour (KNN) etc., it is also necessary to consider the input values entered by the user. By analysing both the accuracy results for the model and the machine learning algorithms, we can determine which algorithm is most effective in predicting liver disease.
4.	Social impact / customer satisfaction	Liver disease is one of the key causes of high numbers of deaths in the country and is considered a life-threatening disease, not just anywhere, but worldwide. Liver disease can also impact people early in their life. The application will have the option to predict liver infection before and advise the wellbeing condition. These methods can reduce many of the limitations that

		occur in healthcare associated with inaccuracy in diagnoses, missing data, cost, and time. The application of the ML methods can help reduce the total burden of liver disease on public health worldwide by improving the recognition of risk factors and diagnostic variables. More importantly, for chronic liver disease, detecting liver disease at earlier stages or in hidden cases by ML could decrease liver-related mortality, transplants, and/or hospitalizations. Early detection improves prognosis since treatment can be given before the progression of the disease to later stages. Invasive tests, such as biopsy, would occur less in this case as well. Although this study focused on hepatitis and chronic liver disease variables for ML training, it can be hypothesized that the methods can be used to distinguish other types of liver disease from healthy individuals.
5.	Business model (financial benefit)	The liver is one of the most important organs in the human body. liver diseases should be found at the early stage. So, this method is useful to detect liver disease easily in the early stage. This application is useful for both doctors and patients for the following reasons: 1. The performance classification of liver-based diseases is further improved. 2. Time complexity and accuracy can be measured by various machine learning models, so that we can measure different parameters, owing to the needs of the user. 3. The cost of traditional testing is expensive and people cannot easily afford those tests. 4. Our methods can save time and costs for the betterment of people. 5. No medical expertise is required You don't need to have any knowledge of medical science. 6. The application will have the option to predict liver infection before and advise the wellbeing

		condition. This application can be surprisingly gainful in low-salary nations where an absence of medicinal foundations and just particular specialists.
6.	Scalability of solution	In this project, machine learning algorithms will be used to build a model and then compared to find the most accurate models. The best accurate model will be integrated into a flask-based web application. Thus, the web application allows users to predict diseases easily by entering data they are familiar with. Upon completing the data entry, the user is instantly shown the results in their User Interface.