



# Streamlit Web App For Multiple Disease Prediction Using ML

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Guide By:

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# OUTLINE

- Abstract
- Problem Statement
- Aims, Objective & Proposed System/Solution
- System Design/Architecture
- System Development Approach (Technology Used)
- Algorithm & Deployment
- Implementation
- Conclusion
- Future Scope
- References
- Video of the Project

## Abstract

There are many existing machine learning models related to health care which mainly focuses on detecting only one disease. Therefore, this study has developed a system to forecast several diseases by using a single user interface. Multiple Disease Prediction using Machine Learning and Streamlit is a comprehensive project aimed at predicting various diseases including diabetes, heart disease, liver disease, Parkinson's disease, and breast cancer. This project leverages machine learning algorithms such as Decision Tree, Random Forest, XGBoost, Support Vector Machine (SVM), and Logistic Regression. The accuracy of each algorithm is validated and compared with each other to find the best one for prediction. Furthermore, multiple datasets (for each disease each dataset) are used to achieve utmost accuracy in the predicted results. The models are deployed using the Streamlit library, providing a user-friendly interface for disease prediction.







# Problem Statement

Many of the existing machine learning models for health care analysis are concentrating on one disease per analysis. For example first is for Diabetes analysis, one for Heart analysis, one for Liver diseases like that. If a user wants to predict more than one disease, he/she has to go through different sites. There is no common system where one analysis can perform more than one disease prediction. Some of the models have lower accuracy which can seriously affect patients' health.

## Aim and Objective

**Aim:** To develop a user-friendly web application that utilizes machine learning models to predict the likelihood of multiple diseases based on input parameters provided by the user.

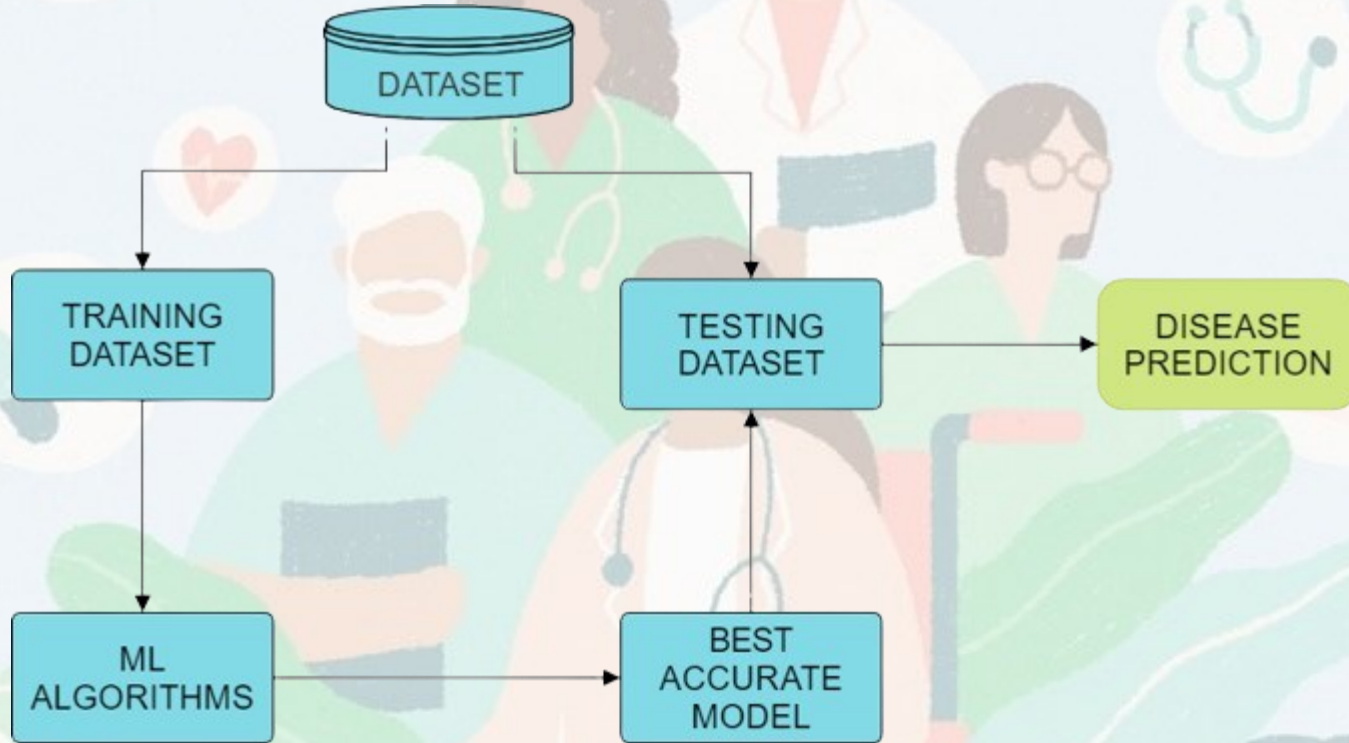
**Objective:** The goal is to create an easy-to-use web app using Streamlit that predicts multiple diseases using machine learning. We'll start by gathering and preparing data for each disease. Then, we'll build separate machine learning models for prediction. These models will be integrated into the app, which will have a simple interface for users to input their data. Once data is entered, the app will make predictions and show the results in an easy-to-understand way. Ultimately, we want to make it easier for people to get early predictions for various diseases, helping them make informed decisions about their health.

## Proposed Solution

In multiple disease prediction, it is possible to predict more than one disease at a time. So, the user doesn't need to traverse different sites in order to predict the diseases. We are taking three diseases that are Liver, Diabetes, and Heart. As all the three diseases are correlated to each other. To implement multiple disease

1. **Data Preparation:** Collect and clean data on various diseases, making sure it's well-organized and ready for analysis.
2. **Model Building:** Train machine learning models for each disease using the prepared data. Choose models that work well for classification tasks.
3. **User Interface with Streamlit:** Use Streamlit to create a web interface where users can input their information (like age, symptoms) and get predictions for different diseases.
4. **Integration:** Connect the trained models to the Streamlit interface so that when a user submits their details, the models process the information and return predictions.

## System Architecture





## System Deployment Approach



1. **Data Collection:** Gather a large dataset of medical records containing patient information and medical features related to diabetes, heart disease, and Parkinson's disease.
2. **Data Preprocessing:** Clean the data by handling missing values, outliers, and scaling features.
3. **Model Training:** Train various machine learning algorithms like decision trees, random forests, and neural networks using the preprocessed data.
4. **Model Selection:** Compare the performance of different algorithms using accuracy, precision, and recall metrics, and choose the best-performing model.
5. **Model Evaluation:** Test the selected model on a separate dataset to measure its accuracy and reliability in predicting the diseases.
6. **User Interface Development:** Create a user-friendly interface for healthcare professionals to input patient information and receive predictions for multiple diseases. Ensure the interface is easy to use and understand.



## Libraries:

Pandas: for data manipulation and analysis.

NumPy: for numerical computing.

Scikit-learn: for machine learning models and evaluation.

Pickle: for saving the model.

Streamlit: for building the web app



*NumPy*



Machine Learning with Scikit-Learn



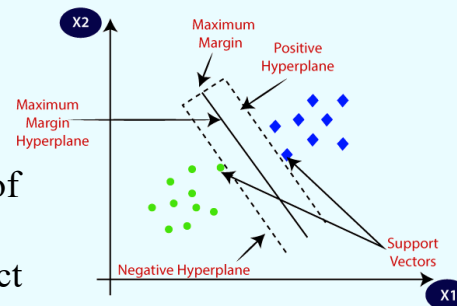
Streamlit

# Algorithm & Deployment

## Algorithms used :-

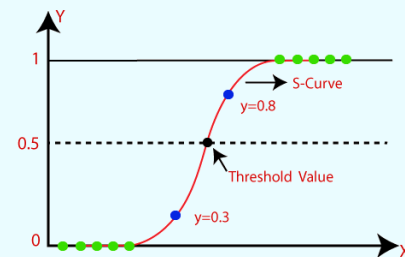
### 1) SVM – Support Vector Machine :

Support Vector Machine or SVM is one of the most popular Supervised Learning algorithms, which is used for Classification as well as Regression problems. The goal of the SVM algorithm is to create the best line or decision boundary that can segregate n-dimensional space into classes so that we can easily put the new data point in the correct category in the future.



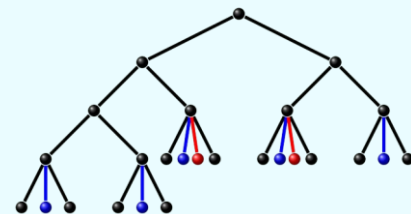
### 2) Logistic Regression :

Logistic regression is one of the most popular Machine Learning algorithms, which comes under the Supervised Learning technique. It is used for predicting the categorical dependent variable using a given set of independent variables. Logistic Regression is a significant machine learning algorithm because it has the ability to provide probabilities and classify new data using continuous and discrete datasets.



### 3) XGBoost:

XGBoost is a robust machine-learning algorithm that can help you understand your data and make better decisions. XGBoost is an implementation of gradient-boosting decision trees. It has been used by data scientists and researchers worldwide to optimize their machine-learning models.





## Procedure :

- Import the necessary libraries and the datasets
- Split the data into features and target variables
- Split the data into training and testing sets
- Train the model on the training data
- Save the model using the pickle module
- Use Streamlit to create a web application that allows users to input their own data and make predictions using the saved model
- Include a button in the application to process the user input and make predictions

# Implementation

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🏠 Main Menu

🏠 Home

⚡ Diabetes Prediction

💓 Heart Disease Prediction

👤 Parkinson's Prediction

📋 Liver Disease Prediction

♀ Breast Cancer Prediction

Presented By :

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2.Tushar Ramani

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Deploy ⋮

Streamlit Web Application  
for  
Multiple Disease Prediction  
using  
Machine Learning

This Web Application is designed to help users predict the likelihood of developing certain diseases based on their input features. With the use of trained and tested machine learning models, we provide predictions for Diabetes, Heart Disease, Parkinson's Disease, Breast Cancer and Liver Disease.

Types of diabetes



Diabetes Prediction

Heart Disease Symptoms



Heart Disease Prediction

PARKINSON'S DISEASE



Parkinson's Prediction

SYMPTOMS OF BREAST CANCER




LIVER DISEASE - SYMPTOMS





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 Main Menu

Home

Diabetes Prediction

Heart Disease Prediction

Parkinson's Prediction

Liver Disease Prediction

Breast Cancer Prediction

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Diabetes Prediction

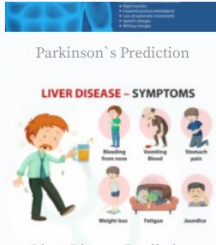


Breast Cancer Prediction



Heart Disease Prediction

Parkinson's Prediction



Liver Disease Prediction

How to Use :

- Navigate to the Main Menu(>) located in the top-left corner of the screen.
- Click on the desired tab among 'Diabetes Prediction', 'Heart Disease Prediction', 'Parkinson's Prediction', 'Breast Cancer Prediction' and 'Liver Disease Prediction' to access prediction tools for specific diseases.
- Enter relevant information as requested in the input fields.
- Click on the 'Test Result' button to obtain predictions based on the provided data.

⌋ Disclaimer :

- This Web App may not provide accurate predictions at all times. When in doubt, please enter the values again and verify the predictions.
- It is important to note that individuals with specific risk factors or concerns should consult with healthcare professionals for personalized advice and management.

×

🏠 Main Menu

🏠 Home

📈 Diabetes Prediction

📈 Heart Disease Prediction

👤 Parkinson's Prediction

📋 Liver Disease Prediction

👩 Breast Cancer Prediction

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## Diabetes Prediction using ML



Enter Your Name:

Number of Pregnancies

Glucose Level

Blood Pressure value

Skin Thickness value

Insulin Level


BMI value

Diabetes Pedigree Function value

Age of the Person

Diabetes Test Result

×

 Main Menu

Home

**Diabetes Prediction**

Heart Disease Prediction

Parkinson's Prediction

Liver Disease Prediction

Breast Cancer Prediction

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## Diabetes Prediction using ML



Enter Your Name:

Tushar Ramani

Number of Pregnancies

0

Glucose Level

100

Blood Pressure value

50

Skin Thickness value

12

Insulin Level

20

BMI value

12

Diabetes Pedigree Function value

0.22

Age of the Person

20

Diabetes Test Result

**NEGATIVE**

Congratulation Tushar Ramani You are not diabetic

# Heart Disease Prediction using ML



## Main Menu

[Home](#)[Diabetes Prediction](#)[Heart Disease Prediction](#)[Parkinson's Prediction](#)[Liver Disease Prediction](#)[Breast Cancer Prediction](#)

### Presented By :

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Enter Your Name:

Enter your age:

Gender

Male

Chest pain type

0

Resting blood pressure:

Serum cholestoral in mg/dl:

Fasting blood sugar

0

Resting Electrocardiographic results:

0

Maximum Heart Rate achieved:

Exercise Induced Angina:

0

ST depression induced by exercise:

Slope of the peak exercise ST segment:

0

Major vessels colored by flourosopy

0

thal: 0 = normal; 1 = fixed defect; 2 = reversible defect

0

Heart Disease Test Result



×

🏠 Main Menu

🏠 Home

📶 Diabetes Prediction

❤️ **Heart Disease Prediction**

👤 Parkinson's Prediction

📋 Liver Disease Prediction

♀️ Breast Cancer Prediction

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Deploy

⋮

## Heart Disease Prediction using ML



Enter Your Name:

Hazira Idrisi

Enter your age:

22

Gender:

Female

Chest pain type:

3

Resting blood pressure:

100

Serum cholestoral in mg/dl:

200

Fasting blood sugar:

0

Resting Electrocardiographic results:

0

Maximum Heart Rate achieved:

120

Exercise Induced Angina:

1

ST depression induced by exercise:

2.3

Slope of the peak exercise ST segment:

2

Major vessels colored by flourosopy:

3

thal: 0 = normal; 1 = fixed defect; 2 = reversable defect

1

Heart Disease Test Result

**POSITIVE**

Hazira Idrisi : we are really sorry to say but it seems like you have Heart Disease.

## Conclusion

The main objective of this project was to create a system that would predict more than one disease and do so with high accuracy. Because of this project the user doesn't need to traverse different websites which saves time as well. Diseases if predicted early can increase your life expectancy as well as save you from financial troubles. For this purpose, we have used various machine learning algorithms like Random Forest, XGBoost, and Logistic Regression to achieve maximum accuracy.

## Future Scope

In the future we can add more diseases in the existing API.

We can try to improve the accuracy of prediction in order to decrease the mortality rate.

Try to make the system user-friendly and provide a chatbot for normal queries.

## Reference

<https://www.kaggle.com/>

<https://docs.streamlit.io/>

<https://colab.google/>

<https://github.com/>

<https://chat.openai.com/>

<https://youtube.com/>

[https://github.com/TusharRamani/Multiple\\_Disease\\_Prediction\\_Streamlit](https://github.com/TusharRamani/Multiple_Disease_Prediction_Streamlit)



Health Assistant

localhost:8502

New folder

All Bookmarks

Deploy

 Main Menu

Home

Diabetes Prediction

Heart Disease Prediction

Parkinson's Prediction

Liver Disease Prediction

Breast Cancer Prediction

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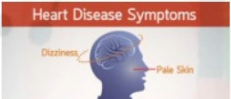
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