

# Heart Disease Prediction using Machine Learning

Project Group 13

# TEAM PRESENTATION

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING



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# CONTENTS

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

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Introduction

---

Problem Statement

---

Motivation and Objectives

---

Project Requirements && Implementation Strategy

---

Proposed model

---

Machine Learning Models

---

Conclusion

---

Reference



# INTRODUCTION

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

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**A heart attack (Cardiovascular diseases) occurs when the flow of blood to the heart muscle suddenly becomes blocked. From WHO statistics every year 17.9 million dying from heart attack. The medical study says that human life-style is the main reason behind this heart problem. Apart from this there are many key factors which warns that the person may/may not getting chance of heart attack.**

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**Among various life-threatening diseases, heart disease had the major attention in medical research.**

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**The different causes of heart diseases that are preventable are as:**

Smoking, Lack of sleep, High blood pressure, High cholesterol levels, Diabetes ,No or less physical activity, Unhealthy diet habits, Consumption of alcohol, Mental stress and depression,

**The unpreventable causes of heart diseases are:**

Increasing age, Family history of heart diseases.



# PROBLEM STATEMENT:

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

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Heart Disease predictions using Machine Learning. Predictions are the most complicated tasks in medical industry, and they rely on humans' physical examination results, symptoms and signs of the patient's behavior. As we all know that heart disease is very dangerous for human beings and per every minute one person dies with heart diseases. Heart disease can be predicted based on various symptoms such as age, gender, heart rate, etc. and reduce the death rate of heart patients.

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Now with help of new programming languages and technologies, we can easily analyze the large amount datasets and predicting the heart diseases easily by using machine learning algorithms.

# MOTIVATIONS && OBJECTIVES

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

### MOTIVATIONS

- Quality of service at affordable cost.
- Poor clinical decisions can lead to disastrous consequences which are unacceptable.
- Hospitals must also minimize the cost of clinical test.
- with the help of computer-based information and decision support system they can achieve good results

### OBJECTIVES

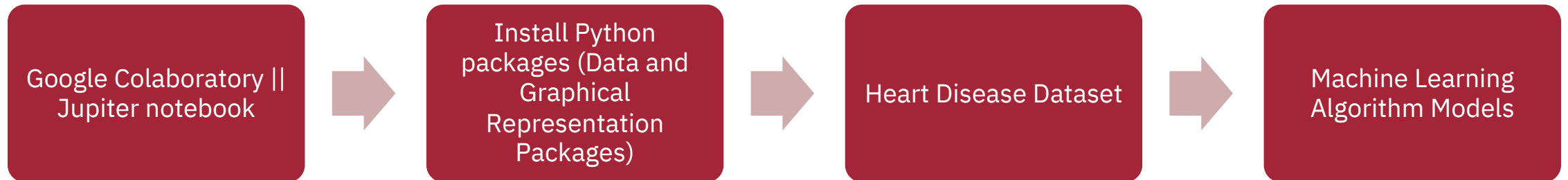
- The main objective of this research is to develop a heart prediction system.
- Applying machine learning techniques on medical data to assist in the prediction of heart disease.



# Project Requirements

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

### Software Requirements



# Source of Dataset

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING



This dataset contains some medical information of patients which tells whether that person has a heart attack chance is less or more. Using the information explore the dataset and classify the target variable using different Machine Learning models and find out which algorithm is suitable for this dataset.



<https://www.kaggle.com/datasets/johnsmith88/heart-disease-dataset?resource=download>





# PROJECT REQUIREMENTS

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

### Dataset's Attribute Information:

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age

---

sex

---

chest pain type (4 values)

---

resting blood pressure

---

serum cholestoral in mg/dl

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fasting blood sugar > 120 mg/dl

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resting electrocardiographic results (values 0,1,2)

---

maximum heart rate achieved

---

exercise induced angina

---

oldpeak = ST depression induced by exercise relative to rest

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the slope of the peak exercise ST segment

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number of major vessels (0-3) colored by flourosopy

---

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



# IMPLEMENTATION STRATEGY

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING



### Dataset

**Heart Data Set Contains Several Health Parameters Which corresponds to persons healthiness of heart**



### Data Processing

**Processing the dataset (To make it fit and compatible to our ML)  
Split data into training data and test data**



### Apply Machine Learning Concepts

**Evaluate model by using test data  
Applying Machine Learning Algorithms**



# PROJECT REQUIREMENTS

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

Who is your target user/demographic?

- Heart Patients, Hospitals and Doctors
- Any authorized organizations.

What value does your application bring the user?

- With the help of their clinical test data, they can check their health related to heart disease.
- With the help of quick accurate results, Users will start improving their healthy life-style.

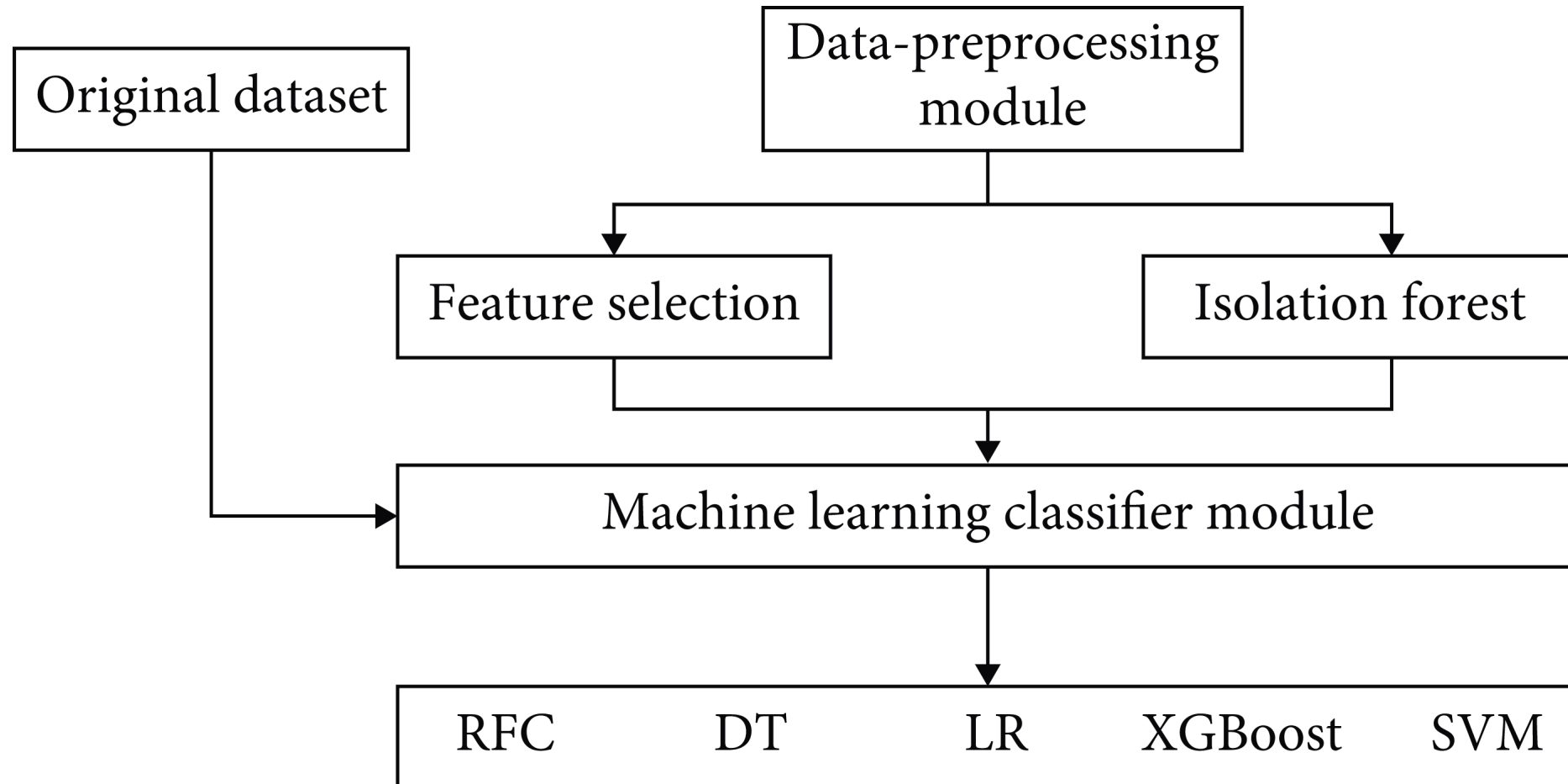
Why is this project worthwhile to use on?

- This project helps in getting results quickly , reduces the clinical test cost and helps with accurate results
- Prevent the **poor clinical decisions**



# PROPOSED MODEL

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING



# MODEL METRICS AND EVALUATION

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

- Heart Data Set Contains Several Health Parameters Which corresponds to persons healthiness of heart
- Processing the dataset(To make it fit and compatible to our ML
- Split data into training data and test data
- Evaluate model by using test data
- Machine Learning Model
  - ❑ Logistic Regression Model(classify person diseased or not)(binary classification)
  - ❑ Train data using LRM-> gets Trained LRM
  - ❑ With new LRM data-> Trained LRM->Healthy or Heart Defect

# MACHINE LEARNING MODELS

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

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Here I take different machine learning algorithm and try to find algorithm which predict accurately.

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Logistic Regression

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Naive Bayes

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Random Forest Classifier

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Extreme Gradient Boost

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K-Nearest Neighbor

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Decision Tree

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Support Vector Machine

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# MODEL METRICS AND EVALUTION

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

Correlation Matrix,

Precision,

recall,

f1-score,

support,

Confusion Matrix



# CONCLUSION

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

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Heart Disease prediction is challenging and very important in medical field. However, the mortality rate can be drastically controlled if the disease is detected at early stage and preventive measures are adopted as soon as possible.

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Extreme Gradient Boost gives the best Accuracy compared to other models.

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Ensembling technique increase the accuracy of the model.

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Exercise induced angina, Chest pain is major symptoms of heart attack.

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From the above model accuracy, XGBoost is giving us the accuracy which is 84.62%.



# REFERENCE

## HEART DISEASE PREDICTIONS USING MACHINE LEARNING

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Heart Disease Research Work:

[https://www.researchgate.net/publication/349470771\\_Using\\_Machine\\_Learning\\_for\\_Heart\\_Disease\\_Prediction](https://www.researchgate.net/publication/349470771_Using_Machine_Learning_for_Heart_Disease_Prediction)

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About Heart Disease:

[https://simple.wikipedia.org/wiki/Heart\\_disease](https://simple.wikipedia.org/wiki/Heart_disease)

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Source of Dataset :

<https://www.kaggle.com/datasets/johnsmith88/heart-disease-dataset?resource=download>





# THANK YOU

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