PSG COLLEGE OF TECHNOLOGY, COIMBATORE – 641 004
DEPARTMENT OF COMPUTER APPLICATIONS
AY 2023-2024 MCA Second Year Semester: 3
20MX37 - MINI PROJECT
Design Abstract

I. Team Detail

Batch No.	Roll No.	Name of the student	Name of the Faculty Guide
	22MX113	RAMESH M	Ms Rajeswari N
	22MX122	SATHIYA LINGESH V	

II. Title of the Mini Project

Heart Disease Prediction using Machine Learning

III. Abstract

Heart disease is a significant health concern globally, necessitating effective predictive models to identify individuals at risk and facilitate early treatments. Early detection and accurate prediction of heart disease risk are critical for effective prevention and timely intervention. This project outlines the development and evaluation of a predictive model to assess the likelihood of an individual developing heart disease based on various risk factors and medical parameters. Here, we use various parameters such as heart rate, age, sex, chest pain type (which consist of typical angina , atypical angina, non-anginal pain, asymptomatic), serum cholesterol, blood pressure, blood sugar level, resting electrocardiographic results (normal, ST-T wave abnormality, probable or definite left ventricular hypertrophy), thalach (maximum heart rate achieved),exang-exercise induced angina, target(1=heart disease,2= no). According to these parameters, different models using different algorithms are trained to find which is more accurate in predicting heart disease.

The proposed predictive model leverages machine learning techniques and a diverse dataset comprising medical records. Preprocessing methods are used to extract relevant information from the data, reducing noise and enhancing the model's predictive capabilities. Several supervised learning algorithms are explored to build the predictive model. The dataset includes individuals from different age groups, genders, ethnicities, and geographic locations. It helps healthcare professionals in identifying high-risk patients at an early stage.

IV. Existing System

The possibility of developing heart disease in the future cannot be predicted in the traditional system. Only with the assistance of doctors can we diagnose and arrive at a decision; otherwise, we are restricted to using only the most recent and prior medical data. The risks of future outcomes cannot be foreseen with accuracy of these data. Additionally, it is challenging for patients to manually maintain their records and for doctors to analyse their data and determine their risk level. There isn't a reliable system in place to forecast heart risk.

V. Objectives of the Proposed Project

With the help of various algorithms, training a model to predict the risk of heart disease. Choosing the algorithm with the highest degree of accuracy from these thus produces accurate results. Consequently, using a trained model reduces the amount of manual work required and yields accurate results with future projection. Thus, these future projections can be used to predict the heart risk levels. These models are developed using a dataset of various individuals representing various age groups, sex, heart rates, cholesterol levels, etc. These models classify them based on various factors,

predict the heart risk based on various factors, and generate the results. With the help of these predictions, doctors can treat patients more effectively and prevent heart disease and other fatalities by starting their care early. These models assist in foreseeing potential risks so that early precautions can be taken to lower the risk.

VI. Scope / Use

These models aid in identifying patients' potential risk for developing heart disease, enabling them to receive early treatment in order to prevent the disease and even save their lives. Additionally, it helps doctors anticipate the patient's future heart risk effectively and prescribe early treatment, diet, and medications in accordance with these results. This trained model makes it simple to identify those who are vulnerable and raise awareness among them.

VII. Technology to be used (Specific Framework etc.)

Python

Libraries: NumPy, SkLearn, MatPlotLib, Pandas

VIII. Non-Functional Requirements of the Project

- Performance
- Scalability
- Privacy and Security
- Usability
- Reliability

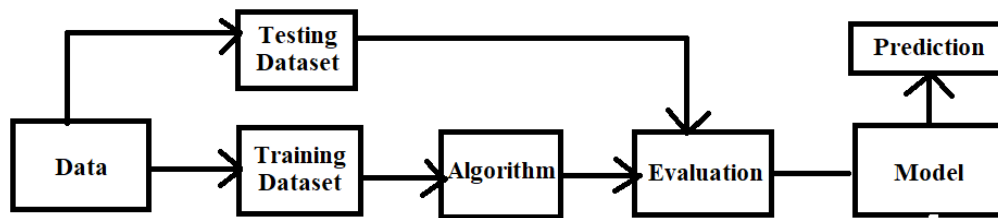**IX. Functional Requirements of the Project**

- Accuracy
- Validation
- Prediction

X. Complete interface/prototype of the proposed project (use Storyboarding method / Wireframe tools to do this….)

XI. Use Case Diagram for the project:

XII. Flow diagram of the Project (CAD/ Flow chart kind of simple diagram to illustrate the functional flow of your project)

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              ┌──→│ Testing  │──────────────────┐           │ Prediction │
              │   │ Dataset  │                   │           └────────────┘
              │   └──────────┘                   ↓                 ↑
  ┌────────┐  │   ┌──────────┐   ┌──────────┐  ┌────────────┐  ┌────────┐
  │  Data  │──┼──→│ Training │──→│ Algorithm│─→│ Evaluation │──│ Model  │
  └────────┘      │ Dataset  │   └──────────┘  └────────────┘  └────────┘
                  └──────────┘
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XIII. Database Schema of the project:

XIV. Other specifications/diagrams related to your work:

XV. Timeline of Activities planned/completed

Signature of the students
Name 1 : Ramesh M

Name 2 : Sathiya Lingesh V

Signature of the Guide
Name : Ms Rajeswari N