Visualizing and Predicting Heart Diseases with an Interactive Dash Board

A PROJECT REPORT
TEAM ID :PNT2022TMID39696

Submitted by

MUKESH BABU M	**510819104010**
JAGGESH M	**510819104008**
PRASATH T	**510819104013**
SUJITH N	**510819104019**

BACHELOR OF ENGINEERING
IN
COMPUTER SCIENCE AND ENGINEERING

Project Report Format

Source Code
GitHub & Project Demo Link

CHAPTER 1
INTRODUCTION

1.1 : PROJECT OVERVIEW:

The terms "heart disease" and "cardiovascular disease" are frequently used interchangeably. Heart disease is a general term that covers a wide range of heart related medical conditions. The irregular health state that directly affects the heart and all of its components is characterized by these medical conditions. In order to forecast cardiac disease, this study discusses various data mining, big data, and machine learning techniques. Building an important model for the medical system to forecast heart disease or cardiovascular illness requires the use of data mining and machine learning. Our application helps the user in finding out if they have heart disease or not. They can find out by entering details such as their heart rate, cholesterol, blood pressure etc. A dashboard is also attached along with the results for better understanding where they

can compare their blood pressure and similar metrics with other users. This project focuses on Random Forest Classifier. The accuracy of our project is 87% for which is better than most other systems in terms of achieving accuracy quickly.

1.2 : PURPOSE:

This project's goal is to determine, depending on the patient's medical characteristics—such as gender, age, chest pain, fasting blood sugar level, etc.—whether they are likely to be diagnosed with any cardiovascular heart illnesses. The leading cause of death in the developed world is heart disease. Heart disease cases are rising quickly every day, thus it's crucial and worrisome to predict any potential illnesses in advance. This diagnosis is a challenging task that requires accuracy and efficiency. Therefore, there needs to be work done to help prevent the risks of having a heart attack or stroke. It is the main factor in adult deaths. By using a person's medical history, our initiative can identify those who are most likely to be diagnosed with a cardiac condition. It can assist in identifying disease with less medical tests and effective therapies, so that patients can be treated appropriately. It can identify anyone who is experiencing any heart disease symptoms, such as chest pain or high blood pressure. Around the world, machine learning is applied in many different fields. There is no exception in the healthcare sector. Machine

learning may be crucial in determining whether locomotor disorders, heart illnesses, and other conditions are present or absent. If foreseen well in advance, such information can offer valuable insights to doctors, who can then customise their diagnosis and course of care for each patient.

CHAPTER 2
LITERATURE SURVEY

[1].TITLE: Heart disease prediction system based on hidden naïve bayes classifier

AUTHOR: M.A.Jabbar, Shirina Samreen

YEAR: 2017

DESCRIPTION: Coronary heart disease is a major cause of death worldwide. The diagnosis of heart disease is a tedious task. There is a need for an intelligent decision support system for disease prediction. Data mining techniques are often used to classify whether a patient is normal or having heart disease. Hidden Naïve Bayes is a data mining model that relaxes the traditional Naïve Bayes conditional independence assumption. Our proposed model claims that the Hidden Naïve Bayes (HNB) can be applied to heart disease classification (prediction). Our experimental results on heart disease data set show that the HNB records 100% in terms of accuracy and out performs Naïve bayes.

[2].TITLE: Analytical study of heart disease diagnosis using classification techniques

AUTHOR: C. Sowmiya , P. Sumitra

YEAR: 2018

DESCRIPTION: Heart disease is the number one problem for world. Heart disease more than people deaths occur during the first heart attack. But not only for heart attack have some problems attacked for breast cancer, lung cancer, ventricle. Valve, etc... It is essential to have a frame work that can effectually recognize the prevalence of heart disease in thousands of samples instaneously. In this paper the potential of nine (9) classification techniques was evaluated of prediction of heart disease. Namely decision tree, naive Bayesian neural network, SVM.ANN, KNN. My proposed algorithm of Apriori algorithm and SVM (support vector machine) in heart disease prediction. Using medical profiles such as a age, sex, blood pressure, chest pain type, fasting blood sugar. It can predict like of patients getting heart disease Based on this, medical society takes part interest in detecting and preventing the heart disease. From the analysis it have proved that classification based

techniques contribute high effectiveness and obtain high accuracy compare than the previous methods.

[3].TITLE: Heart Disease Prediction using Feature Selection and Ensemble Learning Techniques

AUTHOR: A. Lakshmanarao , A. Srisaila , T.Srinivasa Ravi Kiran

YEAR: 2021

DESCRIPTION:Cardiovascular diseases (heart-related diseases) are the reason for the deaths of 18 million people every year in the world. According to WHO,31% of the deaths worldwide are due to heart-related diseases. In this paper, we proposed a novel machine learning model for heart disease prediction. The proposed method was tested on two different datasets from Kaggle and UCI. We applied sampling techniques to the unbalanced dataset and feature selection techniques are used to find the best features. Later several classifier models were applied and achieved good accuracy with ensemble classifier. The experimentations on two datasets shown that the proposed model is effective for heart disease prediction. Python was used for all implementations.

[4].TITLE: Decision Support System for Heart Disease Diagnosis Using Interval Vague Set and Fuzzy Association Rule Mining

AUTHOR: P. Umasankar , V. Thiagarasu

YEAR: 2019

DESCRIPTION:The most common death is due to the condition that affects the heart is Cardiovascular disease (CVD). The inadequate oxygen to the heart leads to the symptoms like fatigue and chest pain (angina). This paper proposes a framework which incorporates the pre-processing step, Interval Vague set, Fuzzy Association Rule mining and Fuzzy Correlation rule mining for the decision making process. In this paper, the proposed framework mainly focused on the criteria that are causing the heart attack among the people. The preprocessing step is used to reduce the size of the heart disease dataset. Using the Rule Mining algorithm, the set of rules are generated for the prediction of heart diseases based on the selected criteria. Interval vague set is used to solve the decision making problem among the doctors regarding the heart disease among the patient who are in the hesitant state.

[5].TITLE: Heart disease diagnosis using data mining technique

AUTHOR: Sarath Babu , E M Vivek , K P Famina , K Fida , P Aswathi , M Shanid , M Hena

YEAR: 2017

DESCRIPTION: Data mining is an advanced technology, which is the process of discovering actionable information from large set of data, which is used to analyze large volumes of data and extracts patterns that can be converted to useful knowledge. Medical data mining has a great potential for exploring the hidden patterns in the data sets of medical domain. These patterns can be utilized to do clinical diagnosis. These data need to be collected in a standardized form. From the medical profiles fourteen attributes are extracted such as age, sex, blood pressure and blood sugar etc. can predict the likelihood of patient getting heart disease. These attributes are fed in to K-means algorithms, MAFIA algorithm and Decision tree classification in heart disease prediction, applying the data mining technique to heart disease treatment; it can provide as reliable performance as that achieved in diagnosing heart disease. By this medical industries could offer better diagnosis and treatment of the patient to attain a good quality of services. The main advantages of this paper are: early detection of heart disease and its diagnosis correctly on time and providing treatment with affordable cost.

[6].TITLE: Real-time Heart Disease Prediction System using Multilayer Perceptron

AUTHOR: Sakshi Bhoyar , Nikki Wagholikar , Kshitij Bakshi , Sheetal Chaudhari

YEAR: 2021

DESCRIPTION: Stroke, Heart Failure, Arrhythmia, and myocardial infarction are the most common cardiovascular diseases which record high mortality rates around the world. Heart defects are not detected in the early stages due to the impractical costs of the tests available. Thus, a fast, real-time, and reliable system that predicts the chances of a patient having heart disease in an optimized manner is required.In this research, a Neural Networks model using a Multilayer Perceptron (MLP) is proposed for the prediction system. Experimental analysis resulted in an accuracy of 85.71% for UCI Heart Disease dataset and 87.30% for Cardiovascular Disease dataset. When compared to previous research the increase in accuracy was approximately 12-13%. A simple web application tool is also developed using python programming to test the prediction system. This research works towards making a comprehensible tool for medical professionals as well as common people.

[**7].TITLE**: Heart Disease Prediction using Evolutionary Rule Learning

AUTHOR: Aakash Chauhan , Aditya Jain , Purushottam Sharma , Vikas Deep .

YEAR: 2018

DESCRIPTION: In modern society, Heart disease is the noteworthy reason for short life. Large population of people depends on the healthcare system so that they can get accurate result in less time. Large amount of data is produced and collected by the healthcare organization on the daily basis. To get intriguing knowledge, data innovation permits to extract the data through automization of processes. Weighted Association Rule is a type of data mining technique used to eliminate the manual task which also helps in extracting the data directly from the electronic records. This will help in decreasing the cost of services and also helps in saving lives. In this paper, we will find the rule to predict patient's risk of having coronary disease. Test results have shown that vast majority of the rules helps in the best prediction of coronary illness.

[8].TITLE: Prediction of Heart disease using DNN

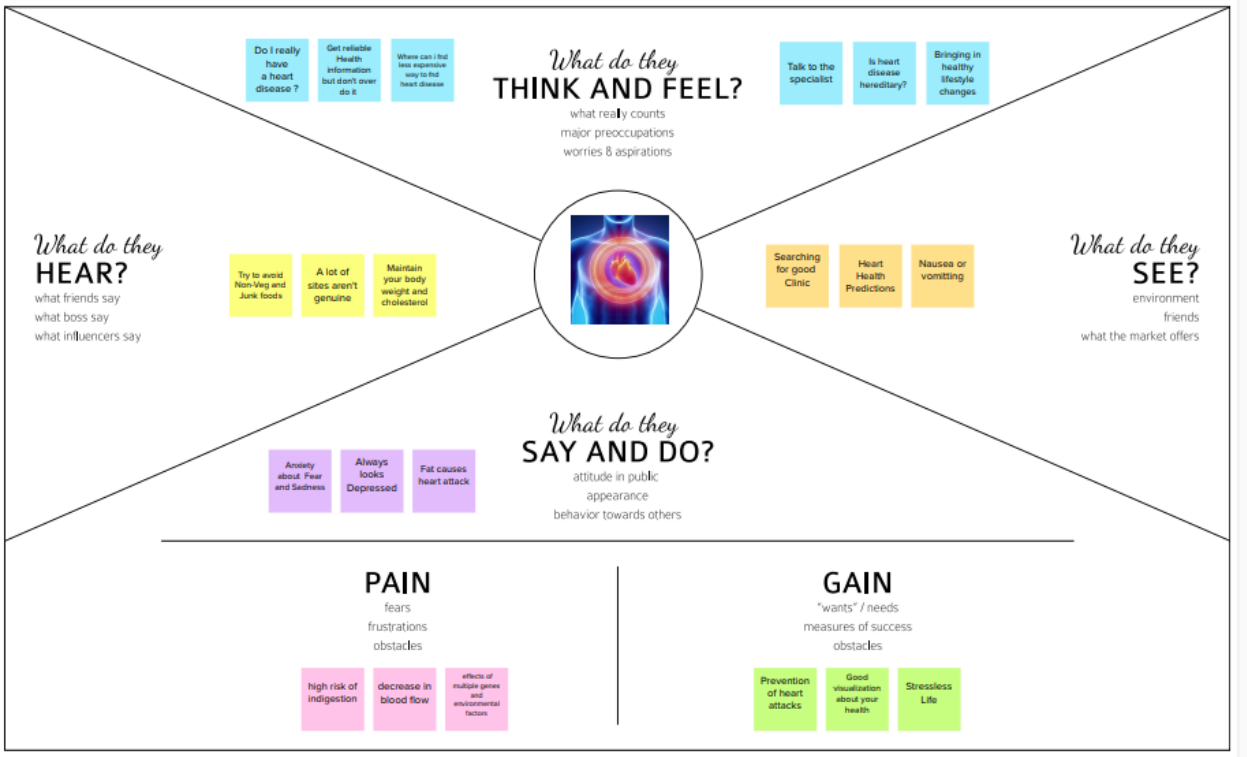
AUTHOR: Vineet Sharma , Akhtar Rasool , Gaurav Hajela

YEAR: 2020

DESCRIPTION: Machine learning classification techniques are extremely useful in the medical field by providing accurate results and quick diagnosis of diseases. Hence, these techniques save lot of time for both doctors and patients. The neural networks can be used as classifiers predict the diagnosis of Cardiovascular Heart disease. This research has explored neural networks, where it has analyzed many optimizing algorithms and weight initializing techniques in this research. The most common algorithms are used and observed their effect on the accuracy of the model. The coronary heart disease dataset is used in the thesis as data to work on. In order to compare results, further analysis has been done and results are compared with performance of other classifiers.

CHAPTER 3
IDEATION AND PROPOSED SOLUTION

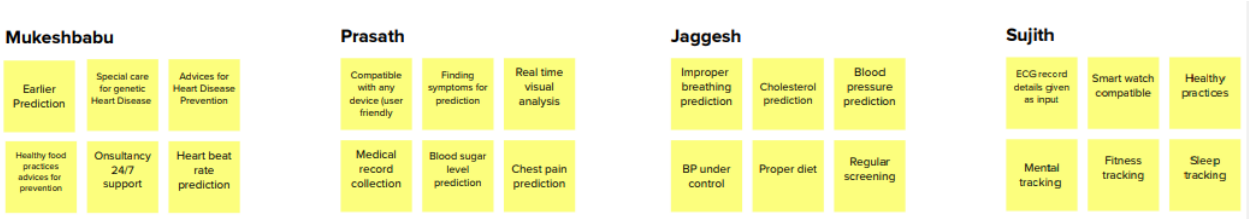
3.1. Empathy Map Canvas



3.2. Ideation & Brainstorming

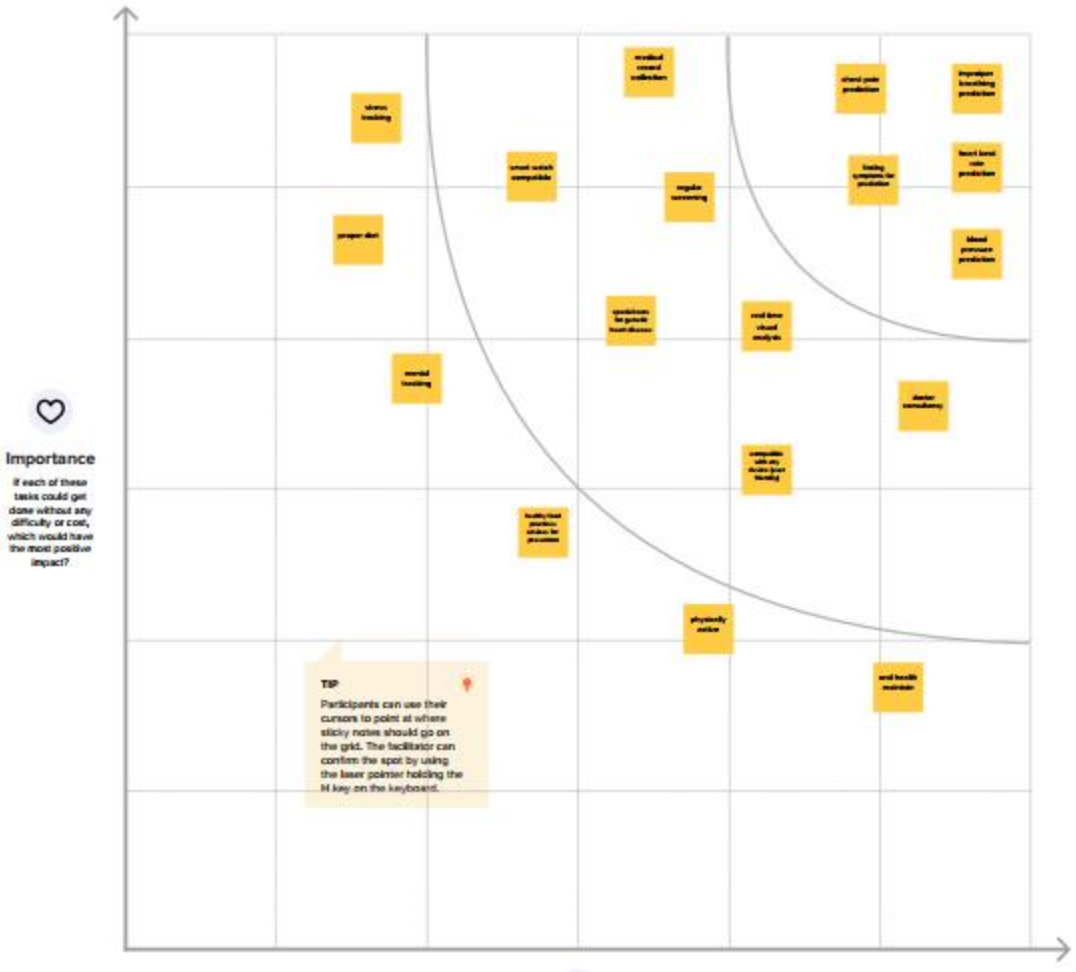
Defne your problem statement What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

Brainstorm Write down any ideas that come to mind that address your problem statement.



Group ideas Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

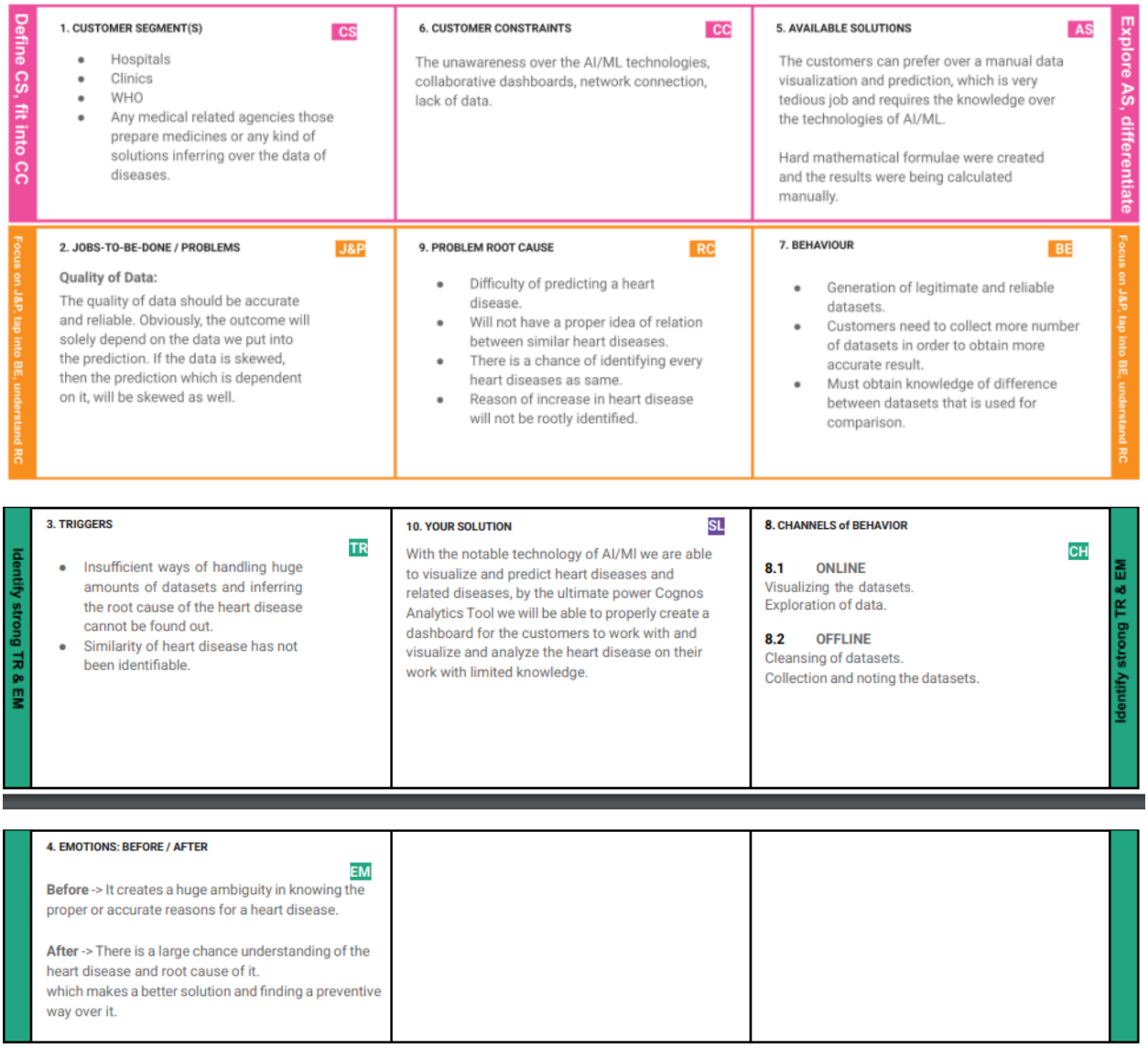
Prioritize Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.



3.3. Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	• The objective of this study is to effectively predict if the patient suffers from heart disease. The health professional enters the input values from the patient's health report. • The data is fed into model which predicts the probability of having heart disease
2.	Idea / Solution description	• By predicting and visualizing the fundamentals Properties that are related to heart disease and visualizing them in a dashboard
3.	Novelty / Uniqueness	• Using the Naive Bayes algorithm we going to predict the heart disease at the maximum accuracy
4.	Social Impact / Customer Satisfaction	• Heart disease kills roughly the same number of people in the United States each year as cancer, lower respiratory diseases (including pneumonia), and accidents combined.
5.	Business Model (Revenue Model)	• This model may increase the accuracy of predicting and easy to understand the status of the patient even though they are not in a technical field
6.	Scalability of the Solution	• This algorithm helps to increase the accuracy and reduce the time consuming to process the data. It achieves the accuracy of 95%

3.4. Problem Solution


Define CS, fit into CC
1. CUSTOMER SEGMENT(S)
CS
Hospitals
Clinics
WHO
Any medical related agencies those prepare medicines or any kind of solutions inferring over the data of diseases.
6. CUSTOMER CONSTRAINTS
CC
The unawareness over the AI/ML technologies, collaborative dashboards, network connection, lack of data.
5. AVAILABLE SOLUTIONS
AS
The customers can prefer over a manual data visualization and prediction, which is very tedious job and requires the knowledge over the technologies of AI/ML.
Hard mathematical formulae were created and the results were being calculated manually.
Explore AS, differentiate
Focus on J&P, tap into BE, understand RC
2. JOBS-TO-BE-DONE / PROBLEMS
J&P
Quality of Data:
The quality of data should be accurate and reliable. Obviously, the outcome will solely depend on the data we put into the prediction. If the data is skewed, then the prediction which is dependent on it, will be skewed as well.
9. PROBLEM ROOT CAUSE
RC
Difficulty of predicting a heart disease.
Will not have a proper idea of relation between similar heart diseases.
There is a chance of identifying every heart diseases as same.
Reason of increase in heart disease will not be rootly identified.
7. BEHAVIOUR
BE
Generation of legitimate and reliable datasets.
Customers need to collect more number of datasets in order to obtain more accurate result.
Must obtain knowledge of difference between datasets that is used for comparison.
Focus on J&P, tap into BE, understand RC
Identify strong TR & EM
3. TRIGGERS
TR
Insufficient ways of handling huge amounts of datasets and inferring the root cause of the heart disease cannot be found out.
Similarity of heart disease has not been identifiable.
10. YOUR SOLUTION
SL
With the notable technology of AI/MI we are able to visualize and predict heart diseases and related diseases, by the ultimate power Cognos Analytics Tool we will be able to properly create a dashboard for the customers to work with and visualize and analyze the heart disease on their work with limited knowledge.
8. CHANNELS of BEHAVIOR
CH
8.1 ONLINE
Visualizing the datasets.
Exploration of data.
8.2 OFFLINE
Cleansing of datasets.
Collection and noting the datasets.
Identify strong TR & EM
4. EMOTIONS: BEFORE / AFTER
EM
Before -> It creates a huge ambiguity in knowing the proper or accurate reasons for a heart disease.
After -> There is a large chance understanding of the heart disease and root cause of it.
which makes a better solution and finding a preventive way over it.

CHAPTER 5

REQUIREMENT ANALYSIS

4.1. Functional Requirement

FR.No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registrations can be done using Email
FR-2	User Confirmation	Registration Confirmation can be sent through E-mail.
FR-3	Visualizing Data	Visualize the presence of heart disease through Dashboard created using IBM Cognos Analytic.s
FR-4	Generation Report	View and generate report.

4.2. Non-Functional Requirements

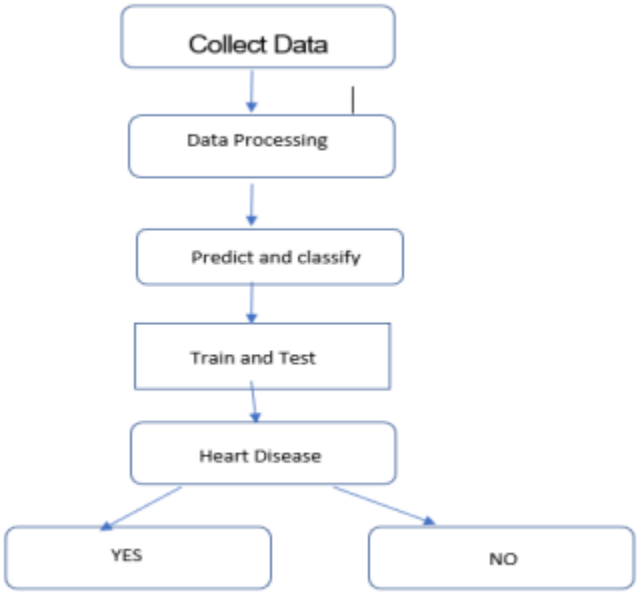
FR.No.	Non-Functional Requirement	Description
NFR-1	Usability	Simple User Interface with easy understanding.
NFR-2	Security	Maintain a secondary/backup dataset User reports are kept safely and remove false data set.
NFR-3	Reliability	Must work without error or minimum error and able to work with various data set
NFR-4	Performance	Depending on the error metrics we have to choose an algorithm with high response time.
NFR-5	Availability	It is based on the IBM cognos analytics so it should be available to all time.
NFR-6	Scalability	Should handle a high number of request atsame time and large datasets.

CHAPTER 5

PROJECT DESIGN

5.1. Data Flow Diagram

Data Flow Diagram A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD diagram can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



Flow:

1) User account will be created in the application.

2) User enters the medical records in the dashboard and search for the requirements.

3) User can view the visualizations of trends in the form of graphs and charts for his/her medical records with the dataset trained.

4) User can view the accuracy of probability of occurrence of heart disease in the dashboard.

5.2. Solution & Technical Architecture

Technical Architecture: The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	Importing data	Data Import lets you upload data from external sources and combine it with data you collect via Analytics	Python, numpy, pandas.
2.	Data Cleaning	Data cleaning is a process by which inaccurate, poorly formatted, or otherwise messy data is organized and corrected	Python, numpy, pandas
3.	Data Preprocessing	Data preprocessing, a component of data preparation, describes any type of processing performed on raw data to prepare it for another data processing procedure	Python, numpy, scipy, pandas
4.	Training data	Training data is the subset of original data that is used to train the machine learning model,	Numpy, scipy, pandas
5.	Testing data	Test data is data which has been specifically identified for use in tests, typically of a computer program.	Numpy, scipy, pandas
6.	Machine learning model	A machine learning model is a file that has been trained to recognize certain types of patterns. You train a model over a set of data, providing it an algorithm that it can use to reason over and learn from those data	Numpy, scipy, pandas, sklearn
7.	Improve model performance	Accuracy is one metric for evaluating classification models. Informally, accuracy is the fraction of predictions our model got right.	sklearn
8.	Checking accuracy	A data accuracy check, sometimes called a data sanity check, is a set of quality validations that takeplace before using data.	Sklearn

Table-2: Application Characteristics:

S.No	**Characteristics**	**Description**	**Technology**
1.	Collection of data	Data collection is the process of gathering, measuring, and analyzing accurate data from a variety of relevant sources to find answers to research problems, answer questions, evaluate outcomes, and forecast trends and probabilities	IBM Cognos, Python.
2.	EDA Analysis	Exploratory Data Analysis (EDA) is an approach to analyze the data using visual techniques. It is used to discover trends, patterns, or to check assumptions with the help of statistical summary and graphical representations	Python, EDA tools
3.	Train & Test split of data	The train-test split is used to estimate the performance of machine learning algorithms that are applicable for prediction-based Algorithms/Applications. This method is a fast and easy procedure to perform such that we can compare our own machine learning model results to machine results.	IBM Cloud,Python.
4.	Model prediction	Predictive modelling is a commonly used statistical technique to predict future behaviour.	Creation of Dashboard using IBM Cognos.

5.3. User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Web user)	Registration	USN-1	User account will be created by entering the mail id and password with confirming the password.	I can access my account / Dashboard	High	Sprint-1
		USN-2	User will receive a confirmation mail on the completion of the registration.	I can receive confirmation email & click confirm	High	Sprint-1
	Login	USN-3	Now user can be able to login with the registered mail id and password.	I can access my account / Dashboard When logged in	High	Sprint-1
Customer (Web user)	Dashboard	USN-4	User can be able to view the complete medical analysis and accuracy of disease.	I can view my medical analysis in the dashboard	High	Sprint-2
		USN-5	User can view the accuracy of occurrence of heart disease in the user dashboard.	I can view the accuracy of heart disease in the dashboard	High	Sprint-2
Customer Care Executive	Helpdesk	USN-6	Customer care executive can be able to view the customer queries.	I can post my queries in the dashboard	Medium	Sprint-3
		USN-7	Customer care executive can be able to answer the customer queries.	I can get support from helpdesk	High	Sprint-3
Administrator	User Profile	USN-8	Admin can update the users health details.	I can view my updated health details.	High	Sprint-4
		USN-9	Admin can add a new user and also can be able to remove the existing user.	I can access my account / Dashboard When logged in	High	Sprint-4
		USN-10	Admin can manage user details.	I can view the organized data of myself.	High	Sprint-4

CHAPTER 6

PROJECT PLANNING & SCHEDULING

6.1. Sprint Planning & Estimation

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	Mukeshbabu M
Sprint-1	Confirmation	USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Prasath T
Sprint-2		USN-3	As a user, I can register for the application through Facebook	2	Low	Jaggesh M
Sprint-1		USN-4	As a user, I can register for the application through Gmail	2	Medium	Sujith N
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High	Mukeshbabu M
Sprint-1	User Interface	USN-6	As a user, I should not need any pre requisites to handle the UI	1	Medium	Prasath T
Sprint-1	Dashboard		As a user, will use the templates and resources of the dashboard effectively	2	High	Jaggesh M
Sprint-1	Present data		As a user, will present the data in the IBM cognos analytics platform	2	High	Sujith N
Sprint	**Functional Requirement (Epic)**	**User Story Number**	**User Story / Task**	**Story Points**	**Priority**	**Team Members**
Sprint-1	EDA		As a user, will perfom the Exploratory Data Analytics(EDA) in a correct manner	2	High	Mukeshbabu M
Sprint-1	Visualization		As a user, data visualization will be performed effectively	2	High	Prasath T
Sprint-2	Report		As a user, I will take responsibility that a report will be finally made by our team	2	High	Jaggesh M

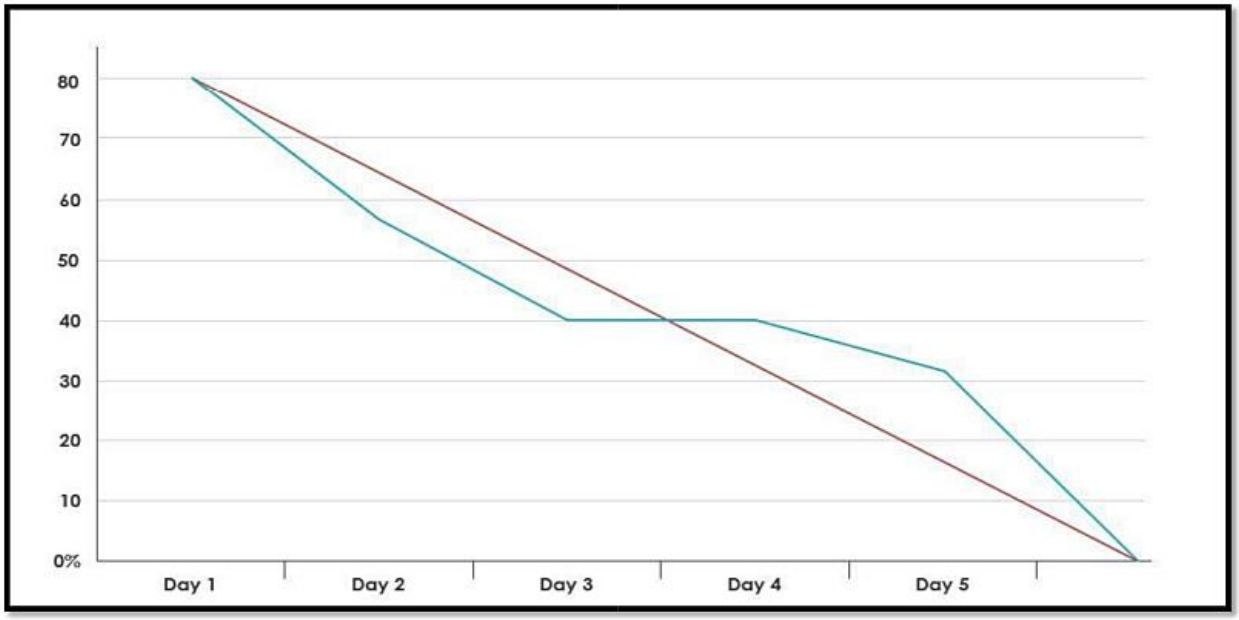
6.2. Sprint Delivery Schedule

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	30	30 Oct 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	49	06 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	50	07 Nov 2022

Velocity: Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

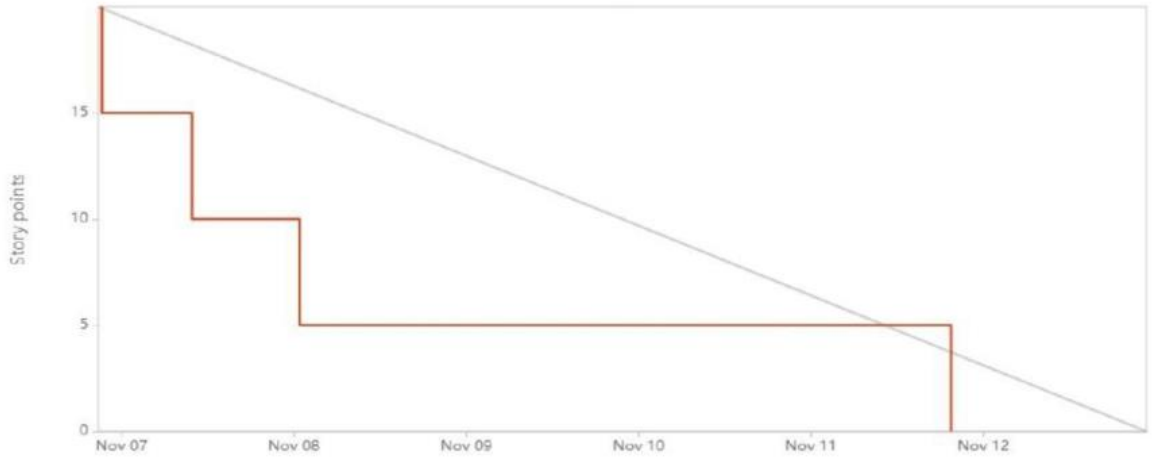
Burndown Chart:



6.3 Report From JIRA

Burndown Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



CHAPTER 7
CODING & SOLUTIONING

7.1:FEATURE 1:

Prediction Model: When applied to a nonlinear data set, the random forest technique performs better than the decision tree. The collection of decision trees known as a random forest was produced by several root nodes. The random forest algorithm can achieve more accuracy quickly and produce expected results.

Algorithm:

Step 1: Input the required details

Step 2: The model processes the input with the help of random forest algorithm

Step 3: The results are displayed

CODE:

```
<!DOCTYPE html>
<html>
```

```
<head>
  <!-- Basic -->
  <meta charset="utf-8" />
  <meta http-equiv="X-UA-Compatible" content="IE=edge" />
  <!-- Mobile Metas -->
  <meta name="viewport" content="width=device-width, initial-scale=1,
shrink-to-fit=no" />
  <!-- Site Metas -->
  <meta name="keywords" content="" />
  <meta name="description" content="" />
  <meta name="author" content="" />
  <link rel="shortcut icon" href="images/favicon.png" type="">

  <title> MJSP Predictor </title>

  <!-- bootstrap core css -->
  <link rel="stylesheet" type="text/css" href="css/bootstrap.css" />

  <!-- fonts style -->
  <link
href="https://fonts.googleapis.com/css2?family=Roboto:wght@400;500;
700;900&display=swap" rel="stylesheet">

  <!--owl slider stylesheet -->
  <link rel="stylesheet" type="text/css"
href="https://cdnjs.cloudflare.com/ajax/libs/OwlCarousel2/2.3.4/assets/o
wl.carousel.min.css" />

  <!-- font awesome style -->
  <link href="css/font-awesome.min.css" rel="stylesheet" />

  <!-- Custom styles for this template -->
  <link href="css/style.css" rel="stylesheet" />
  <!-- responsive style -->
  <link href="css/responsive.css" rel="stylesheet" />

</head>
```

```
<body class="sub_page">

  <div class="hero_area">

    <div class="hero_bg_box">
      <img src="images/hero-bg.png" alt="">
    </div>

    <!-- header section strats -->
    <header class="header_section">
      <div class="container">
        <nav class="navbar navbar-expand-lg custom_nav-container ">
          <a class="navbar-brand" href="index.html">
            <span>
              MJSP Predictor
            </span>
          </a>

          <button class="navbar-toggler" type="button" data-
toggle="collapse" data-target="#navbarSupportedContent" aria-
controls="navbarSupportedContent" aria-expanded="false" aria-
label="Toggle navigation">
            <span class=""> </span>
          </button>

          <div class="collapse navbar-collapse"
id="navbarSupportedContent">
            <ul class="navbar-nav">
              <li class="nav-item">
                <a class="nav-link" href="index.html">Home </a>
              </li>
              <li class="nav-item">
                <a class="nav-link" href="about.html"> About</a>
              </li>
              <li class="nav-item active">
```

```
              <a class="nav-link" href="dashboard.html">Dashboard<span
class="sr-only">(current)</span> </a>
            </li>
            <li class="nav-item">
              <a class="nav-link" href="/report.html">Report</a>
            </li>
            <li class="nav-item">
              <a class="nav-link" href="/story.html">Story</a>
            </li>
            <form class="form-inline">
              <button class="btn  my-2 my-sm-0 nav_search-btn"
type="submit">
                <i class="fa fa-search" aria-hidden="true"></i>
              </button>
            </form>
          </ul>
        </div>
      </nav>
    </div>
  </header>
  <!-- end header section -->
 </div>

 <!-- department section -->

 <section class="department_section layout_padding">
  <div class="department_container">
    <div class="container ">
      <div class="heading_container heading_center">
        <h2>
          Dashboard
        </h2>
        <p>
          Asperiores sunt consectetur impedit nulla molestiae delectus
repellat laborum dolores doloremque accusantium
```

```
          </p>
        </div>
        <iframe
src="https://us3.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;
pathRef=.public_folders%2FDashboard%2FHeart_Disease_Prediction%
2BDashboard_01&amp;closeWindowOnLastView=true&amp;ui_appba
r=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;action
=view&amp;mode=dashboard&amp;subView=model0000018488d2ca7
1_00000000" width="1200" height="900" frameborder="0"
gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
        <div class="btn-box">
          <a href="">
            View All
          </a>
        </div>
      </div>
    </div>
  </section>

  <!-- end department section -->

  <!-- footer section -->
  <footer class="footer_section">
    <div class="container">
      <div class="row">
        <div class="col-md-6 col-lg-3 footer_col">
          <div class="footer_contact">
            <h4>
              Reach at..
            </h4>
            <div class="contact_link_box">
              <a href="">
                <i class="fa fa-map-marker" aria-hidden="true"></i>
                <span>
```

```
          Location
        </span>
      </a>
      <a href="">
        <i class="fa fa-phone" aria-hidden="true"></i>
        <span>
          Call +01 1234567890
        </span>
      </a>
      <a href="">
        <i class="fa fa-envelope" aria-hidden="true"></i>
        <span>
          demo@gmail.com
        </span>
      </a>
    </div>
  </div>
  <div class="footer_social">
    <a href="">
      <i class="fa fa-facebook" aria-hidden="true"></i>
    </a>
    <a href="">
      <i class="fa fa-twitter" aria-hidden="true"></i>
    </a>
    <a href="">
      <i class="fa fa-linkedin" aria-hidden="true"></i>
    </a>
    <a href="">
      <i class="fa fa-instagram" aria-hidden="true"></i>
    </a>
  </div>
</div>
<div class="col-md-6 col-lg-3 footer_col">
  <div class="footer_detail">
    <h4>
```

```
            About
           </h4>
           <p>
            Beatae provident nobis mollitia magnam voluptatum, unde dicta facilis minima veniam corporis laudantium alias tenetur eveniet illum reprehenderit fugit a delectus officiis blanditiis ea.
           </p>
          </div>
         </div>
         <div class="col-md-6 col-lg-2 mx-auto footer_col">
          <div class="footer_link_box">
           <h4>
            Links
           </h4>
           <div class="footer_links">
            <a class="" href="index.html">
             Home
            </a>
            <a class="" href="about.html">
             About
            </a>
            <a class="active" href="/dashboard.html">
             Dashboard
            </a>
            <a class="" href="/report.html">
             Report
            </a>
            <a class="" href="/story.html">
             Story
            </a>
           </div>
          </div>
         </div>
        </div>
        <div class="footer-info">
```

```
        <p>
          &copy; <span id="displayYear"></span> All Rights Reserved By
MJSP Predictor<br><br></a>
        </p>
      </div>
    </div>
  </footer>
  <!-- footer section -->

  <!-- jQery -->
  <script type="text/javascript" src="js/jquery-3.4.1.min.js"></script>
  <!-- popper js -->
  <script
src="https://cdn.jsdelivr.net/npm/popper.js@1.16.0/dist/umd/popper.min
.js" integrity="sha384-
Q6E9RHvbIyZFJoft+2mJbHaEWldlvI9IOYy5n3zV9zzTtmI3UksdQRV
voxMfooAo" crossorigin="anonymous">
  </script>
  <!-- bootstrap js -->
  <script type="text/javascript" src="js/bootstrap.js"></script>
  <!-- owl slider -->
  <script type="text/javascript"
src="https://cdnjs.cloudflare.com/ajax/libs/OwlCarousel2/2.3.4/owl.caro
usel.min.js">
  </script>
  <!-- custom js -->
  <script type="text/javascript" src="js/custom.js"></script>
  <!-- Google Map -->
  <script
src="https://maps.googleapis.com/maps/api/js?key=AIzaSyCh39n5U-
4IoWpsVGUHWdqB6puEkhRLdmI&callback=myMap">
  </script>
  <!-- End Google Map -->

</body>
```

```
</html>
```

7.2: FEATURE 2:

Dashboard: Our application helps the user in finding out if they have heart disease or not. They can find out by entering details such as their heart rate, cholesterol, blood pressure etc. A dashboard is also attached along with the results for better understanding where they can compare their blood pressure and similar metrics with other users.

CODE:

```
<!DOCTYPE html>
<html>

<head>
  <!-- Basic -->
  <meta charset="utf-8" />
  <meta http-equiv="X-UA-Compatible" content="IE=edge" />
  <!-- Mobile Metas -->
  <meta name="viewport" content="width=device-width, initial-scale=1,
shrink-to-fit=no" />
  <!-- Site Metas -->
  <meta name="keywords" content="" />
```

```
  <meta name="description" content="" />
  <meta name="author" content="" />
  <link rel="shortcut icon" href="images/favicon.png" type="">

  <title> MJSP Predictor </title>

  <!-- bootstrap core css -->
  <link rel="stylesheet" type="text/css" href="css/bootstrap.css" />

  <!-- fonts style -->
  <link
href="https://fonts.googleapis.com/css2?family=Roboto:wght@400;500;
700;900&display=swap" rel="stylesheet">

  <!--owl slider stylesheet -->
  <link rel="stylesheet" type="text/css"
href="https://cdnjs.cloudflare.com/ajax/libs/OwlCarousel2/2.3.4/assets/o
wl.carousel.min.css" />

  <!-- font awesome style -->
  <link href="css/font-awesome.min.css" rel="stylesheet" />

  <!-- Custom styles for this template -->
  <link href="css/style.css" rel="stylesheet" />
  <!-- responsive style -->
  <link href="css/responsive.css" rel="stylesheet" />

</head>

<body>

  <div class="hero_area">

    <div class="hero_bg_box">
      <img src="images/hero-bg.png" alt="">
    </div>

    <!-- header section strats -->
```

```
    <header class="header_section">
      <div class="container">
        <nav class="navbar navbar-expand-lg custom_nav-container ">
          <a class="navbar-brand" href="index.html">
            <span>
              MJSP Predictor
            </span>
          </a>

          <button class="navbar-toggler" type="button" data-
toggle="collapse" data-target="#navbarSupportedContent" aria-
controls="navbarSupportedContent" aria-expanded="false" aria-
label="Toggle navigation">
            <span class=""> </span>
          </button>

          <div class="collapse navbar-collapse"
id="navbarSupportedContent">
            <ul class="navbar-nav">
              <li class="nav-item active">
                <a class="nav-link" href="index.html">Home <span
class="sr-only">(current)</span></a>
              </li>
              <li class="nav-item">
                <a class="nav-link" href="about.html"> About</a>
              </li>
              <li class="nav-item">
                <a class="nav-link" href="dashboard.html">Dashboard</a>
              </li>
              <li class="nav-item">
                <a class="nav-link" href="/report.html">Report</a>
              </li>
              <li class="nav-item">
                <a class="nav-link" href="/story.html">Story</a>
              </li>
```

```
            <form class="form-inline">
              <button class="btn  my-2 my-sm-0 nav_search-btn"
type="submit">
                <i class="fa fa-search" aria-hidden="true"></i>
              </button>
            </form>
          </ul>
        </div>
      </nav>
    </div>
  </header>
  <!-- end header section -->
  <!-- slider section -->
  <section class="slider_section ">
    <div id="customCarousel1" class="carousel slide" data-
ride="carousel">
      <div class="carousel-inner">
        <div class="carousel-item active">
          <div class="container ">
            <div class="row">
              <div class="col-md-7">
                <div class="detail-box">
                  <h1>
                    We Provide Best Healthcare
                  </h1>
                  <p>
                    Explicabo esse amet tempora quibusdam laudantium,
laborum eaque magnam fugiat hic? Esse dicta aliquid error repudiandae
earum suscipit fugiat molestias, veniam, vel architecto veritatis delectus
repellat modi impedit sequi.
                  </p>
                  <div class="btn-box">
                    <a href="" class="btn1">
                      Read More
                    </a>
```

```
            </div>
          </div>
        </div>
      </div>
    </div>
    <div class="carousel-item ">
      <div class="container ">
        <div class="row">
          <div class="col-md-7">
            <div class="detail-box">
              <h1>
                We Provide Best Healthcare
              </h1>
              <p>
                Explicabo esse amet tempora quibusdam laudantium, laborum eaque magnam fugiat hic? Esse dicta aliquid error repudiandae earum suscipit fugiat molestias, veniam, vel architecto veritatis delectus repellat modi impedit sequi.
              </p>
              <div class="btn-box">
                <a href="" class="btn1">
                  Read More
                </a>
              </div>
            </div>
          </div>
        </div>
      </div>
    </div>
    <div class="carousel-item">
      <div class="container ">
        <div class="row">
          <div class="col-md-7">
            <div class="detail-box">
```

```
                <h1>
                  We Provide Best Healthcare
                </h1>
                <p>
                  Explicabo esse amet tempora quibusdam laudantium,
laborum eaque magnam fugiat hic? Esse dicta aliquid error repudiandae
earum suscipit fugiat molestias, veniam, vel architecto veritatis delectus
repellat modi impedit sequi.
                </p>
                <div class="btn-box">
                  <a href="" class="btn1">
                    Read More
                  </a>
                </div>
              </div>
            </div>
          </div>
        </div>
      </div>
      <ol class="carousel-indicators">
        <li data-target="#customCarousel1" data-slide-to="0"
class="active"></li>
        <li data-target="#customCarousel1" data-slide-to="1"></li>
        <li data-target="#customCarousel1" data-slide-to="2"></li>
      </ol>
    </div>

  </section>
  <!-- end slider section -->
</div>


<!-- department section -->

<section class="department_section layout_padding">
```

```
    <div class="department_container">
      <div class="container ">
        <div class="heading_container heading_center">
          <h2>
            Our Departments
          </h2>
          <p>
            Asperiores sunt consectetur impedit nulla molestiae delectus repellat laborum dolores doloremque accusantium
          </p>
        </div>
        <div class="row">
          <div class="col-md-3">
            <div class="box ">
              <div class="img-box">
                <img src="images/s1.png" alt="">
              </div>
              <div class="detail-box">
                <h5>
                  Cardiology
                </h5>
                <p>
                  fact that a reader will be distracted by the readable page when looking at its layout.
                </p>
              </div>
            </div>
          </div>
          <div class="col-md-3">
            <div class="box ">
              <div class="img-box">
                <img src="images/s2.png" alt="">
              </div>
              <div class="detail-box">
                <h5>
```

```
            Diagnosis
          </h5>
          <p>
            fact that a reader will be distracted by the readable page when
looking at its layout.
          </p>
        </div>
      </div>
    </div>
    <div class="col-md-3">
      <div class="box ">
        <div class="img-box">
          <img src="images/s3.png" alt="">
        </div>
        <div class="detail-box">
          <h5>
            Surgery
          </h5>
          <p>
            fact that a reader will be distracted by the readable page when
looking at its layout.
          </p>
        </div>
      </div>
    </div>
    <div class="col-md-3">
      <div class="box ">
        <div class="img-box">
          <img src="images/s4.png" alt="">
        </div>
        <div class="detail-box">
          <h5>
            First Aid
          </h5>
          <p>
```

fact that a reader will be distracted by the readable page when looking at its layout.

```
            </p>
          </div>
        </div>
      </div>
      <div class="btn-box">
        <a href="">
          View All
        </a>
      </div>
    </div>
  </div>
</section>

<!-- end department section -->

<!-- about section -->

<section class="about_section layout_margin-bottom">
  <div class="container  ">
    <div class="row">
      <div class="col-md-6 ">
        <div class="img-box">
          <img src="images/about-img.jpg" alt="">
        </div>
      </div>
      <div class="col-md-6">
        <div class="detail-box">
          <div class="heading_container">
            <h2>
              About <span>Us</span>
            </h2>
          </div>
          <p>
```

There are many variations of passages of Lorem Ipsum available, but the majority have suffered alteration in some form, by injected humour, or randomised words which don't look even slightly believable. If you are going to use a passage of Lorem Ipsum, you need to be sure there isn't anything embarrassing hidden in the middle of text. All

```
          </p>
          <a href="">
            Read More
          </a>
        </div>
      </div>
    </div>
  </div>
</section>


<!-- end client section -->

<!-- footer section -->
<footer class="footer_section">
  <div class="container">
    <div class="row">
      <div class="col-md-6 col-lg-3 footer_col">
        <div class="footer_contact">
          <h4>
            Reach at..
          </h4>
          <div class="contact_link_box">
            <a href="">
              <i class="fa fa-map-marker" aria-hidden="true"></i>
              <span>
                Location
              </span>
            </a>
```

```
      <a href="">
        <i class="fa fa-phone" aria-hidden="true"></i>
        <span>
          Call +01 1234567890
        </span>
      </a>
      <a href="">
        <i class="fa fa-envelope" aria-hidden="true"></i>
        <span>
          demo@gmail.com
        </span>
      </a>
    </div>
  </div>
  <div class="footer_social">
    <a href="">
      <i class="fa fa-facebook" aria-hidden="true"></i>
    </a>
    <a href="">
      <i class="fa fa-twitter" aria-hidden="true"></i>
    </a>
    <a href="">
      <i class="fa fa-linkedin" aria-hidden="true"></i>
    </a>
    <a href="">
      <i class="fa fa-instagram" aria-hidden="true"></i>
    </a>
  </div>
</div>
<div class="col-md-6 col-lg-3 footer_col">
  <div class="footer_detail">
    <h4>
      About
    </h4>
    <p>
```

Beatae provident nobis mollitia magnam voluptatum, unde dicta facilis minima veniam corporis laudantium alias tenetur eveniet illum reprehenderit fugit a delectus officiis blanditiis ea.

```
          </p>
        </div>
      </div>
      <div class="col-md-6 col-lg-2 mx-auto footer_col">
        <div class="footer_link_box">
          <h4>
            Links
          </h4>
          <div class="footer_links">
            <a class="active" href="index.html">
              Home
            </a>
            <a class="" href="about.html">
              About
            </a>
            <a class="" href="/dashboard.html">
              Dashboard
            </a>
            <a class="" href="/report.html">
              Report
            </a>
            <a class="" href="/story.html">
              Story
            </a>
          </div>
        </div>
      </div>
    </div>
    <div class="footer-info">
      <p>
        &copy; <span id="displayYear"></span> All Rights Reserved By MJSP Predictor<br><br>
```

```
        </p>

      </div>
    </div>
  </footer>
  <!-- footer section -->

  <!-- jQery -->
  <script type="text/javascript" src="js/jquery-3.4.1.min.js"></script>
  <!-- popper js -->
  <script
src="https://cdn.jsdelivr.net/npm/popper.js@1.16.0/dist/umd/popper.min
.js" integrity="sha384-
Q6E9RHvbIyZFJoft+2mJbHaEWldlvI9IOYy5n3zV9zzTtmI3UksdQRV
voxMfooAo" crossorigin="anonymous">
  </script>
  <!-- bootstrap js -->
  <script type="text/javascript" src="js/bootstrap.js"></script>
  <!-- owl slider -->
  <script type="text/javascript"
src="https://cdnjs.cloudflare.com/ajax/libs/OwlCarousel2/2.3.4/owl.caro
usel.min.js">
  </script>
  <!-- custom js -->
  <script type="text/javascript" src="js/custom.js"></script>
  <!-- Google Map -->
  <script
src="https://maps.googleapis.com/maps/api/js?key=AIzaSyCh39n5U-
4IoWpsVGUHWdqB6puEkhRLdmI&callback=myMap">
  </script>
  <!-- End Google Map -->

</body>

</html>
```

7.3: FEATURE 3:

Login Algorithm :

1. Input the credentials (email and password).
2. If already logged in user is taken to home page.
3. Else, check for validity of credentials.
4. If wrong credentials entered , notification is displayed to user and user stays in login page. 5. On correct credentials, user is taken to home page.

CODE:

```
<!DOCTYPE html>
<html>

<head>
  <!-- Basic -->
  <meta charset="utf-8" />
  <meta http-equiv="X-UA-Compatible" content="IE=edge" />
  <!-- Mobile Metas -->
  <meta name="viewport" content="width=device-width, initial-scale=1,
shrink-to-fit=no" />
  <!-- Site Metas -->
  <meta name="keywords" content="" />
  <meta name="description" content="" />
  <meta name="author" content="" />
```

```
  <link rel="shortcut icon" href="images/favicon.png" type="">

  <title>MJSP Predictor</title>

  <!-- bootstrap core css -->
  <link rel="stylesheet" type="text/css" href="css/bootstrap.css" />

  <!-- fonts style -->
  <link
href="https://fonts.googleapis.com/css2?family=Roboto:wght@400;500;
700;900&display=swap" rel="stylesheet">

  <!--owl slider stylesheet -->
  <link rel="stylesheet" type="text/css"
href="https://cdnjs.cloudflare.com/ajax/libs/OwlCarousel2/2.3.4/assets/o
wl.carousel.min.css" />

  <!-- font awesome style -->
  <link href="css/font-awesome.min.css" rel="stylesheet" />

  <!-- Custom styles for this template -->
  <link href="css/style.css" rel="stylesheet" />
  <!-- responsive style -->
  <link href="css/responsive.css" rel="stylesheet" />

</head>

<body class="sub_page">

  <div class="hero_area">

    <div class="hero_bg_box">
      <img src="images/hero-bg.png" alt="">
    </div>

    <!-- header section strats -->
    <header class="header_section">
      <div class="container">
```

```
<nav class="navbar navbar-expand-lg custom_nav-container ">
  <a class="navbar-brand" href="index.html">
    <span>
    MJSP Predictor
    </span>
  </a>

  <button class="navbar-toggler" type="button" data-
toggle="collapse" data-target="#navbarSupportedContent" aria-
controls="navbarSupportedContent" aria-expanded="false" aria-
label="Toggle navigation">
    <span class=""> </span>
  </button>

  <div class="collapse navbar-collapse"
id="navbarSupportedContent">
    <ul class="navbar-nav">
      <li class="nav-item">
        <a class="nav-link" href="index.html">Home </a>
      </li>
      <li class="nav-item">
        <a class="nav-link" href="about.html"> About</a>
      </li>
      <li class="nav-item">
        <a class="nav-link" href="/dashboard.html">Dashboard</a>
      </li>
      <li class="nav-item active">
        <a class="nav-link" href="report.html">Report<span
class="sr-only">(current)</span> </a>
      </li>
      <li class="nav-item">
        <a class="nav-link" href="/story.html">Story</a>
      </li>
      <form class="form-inline">
        <button class="btn  my-2 my-sm-0 nav_search-btn"
```

```
type="submit">
                <i class="fa fa-search" aria-hidden="true"></i>
              </button>
            </form>
          </ul>
        </div>
      </nav>
    </div>
  </header>
  <!-- end header section -->
 </div>

 <!-- doctor section -->

 <section class="doctor_section layout_padding">
  <div class="container">
   <div class="heading_container heading_center">
    <h2>
     Heart Disease Report
    </h2>
    <p class="col-md-10 mx-auto px-0">
     This Report show Heart Disease by Chest Pain Type and Heart Disease by Cholesterol and Heart Disease by Exercise angina .
    </p>
   </div>
   <iframe src="https://us3.ca.analytics.ibm.com/bi/?pathRef=.public_folders%2FReport%2FHeart%2BDisease%2Breport&amp;closeWindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;action=run&amp;format=HTML&amp;prompt=false" width="1200" height="1200" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

   <div class="btn-box">
    <a href="">
     View All
```

```
      </a>
    </div>
  </div>
</section>

<!-- end doctor section -->

<!-- footer section -->
<footer class="footer_section">
  <div class="container">
    <div class="row">
      <div class="col-md-6 col-lg-3 footer_col">
        <div class="footer_contact">
          <h4>
            Reach at..
          </h4>
          <div class="contact_link_box">
            <a href="">
              <i class="fa fa-map-marker" aria-hidden="true"></i>
              <span>
                Location
              </span>
            </a>
            <a href="">
              <i class="fa fa-phone" aria-hidden="true"></i>
              <span>
                Call +01 1234567890
              </span>
            </a>
            <a href="">
              <i class="fa fa-envelope" aria-hidden="true"></i>
              <span>
                demo@gmail.com
              </span>
            </a>
```

```
          </div>
        </div>
        <div class="footer_social">
          <a href="">
            <i class="fa fa-facebook" aria-hidden="true"></i>
          </a>
          <a href="">
            <i class="fa fa-twitter" aria-hidden="true"></i>
          </a>
          <a href="">
            <i class="fa fa-linkedin" aria-hidden="true"></i>
          </a>
          <a href="">
            <i class="fa fa-instagram" aria-hidden="true"></i>
          </a>
        </div>
      </div>
      <div class="col-md-6 col-lg-3 footer_col">
        <div class="footer_detail">
          <h4>
            About
          </h4>
          <p>
            Beatae provident nobis mollitia magnam voluptatum, unde dicta facilis minima veniam corporis laudantium alias tenetur eveniet illum reprehenderit fugit a delectus officiis blanditiis ea.
          </p>
        </div>
      </div>
      <div class="col-md-6 col-lg-2 mx-auto footer_col">
        <div class="footer_link_box">
          <h4>
            Links
          </h4>
          <div class="footer_links">
```

```
            <a class="" href="index.html">
              Home
            </a>
            <a class="" href="about.html">
              About
            </a>
            <a class="" href="/dashboard.html">
              Dashboard
            </a>
            <a class="active" href="/report.html">
              Report
            </a>
            <a class="" href="/story.html">
              Story
            </a>
          </div>
        </div>
      </div>

    </div>
    <div class="footer-info">
      <p>
        &copy; <span id="displayYear"></span> All Rights Reserved By
MJSP Predictor<br><br></a>

      </p>
    </div>
  </div>
 </footer>
 <!-- footer section -->

 <!-- jQery -->
 <script type="text/javascript" src="js/jquery-3.4.1.min.js"></script>
 <!-- popper js -->
 <script
src="https://cdn.jsdelivr.net/npm/popper.js@1.16.0/dist/umd/popper.min
```

```
.js" integrity="sha384-
Q6E9RHvbIyZFJoft+2mJbHaEWldlvI9IOYy5n3zV9zzTtmI3UksdQRV
voxMfooAo" crossorigin="anonymous">
  </script>
  <!-- bootstrap js -->
  <script type="text/javascript" src="js/bootstrap.js"></script>
  <!-- owl slider -->
  <script type="text/javascript"
src="https://cdnjs.cloudflare.com/ajax/libs/OwlCarousel2/2.3.4/owl.caro
usel.min.js">
  </script>
  <!-- custom js -->
  <script type="text/javascript" src="js/custom.js"></script>
  <!-- Google Map -->
  <script
src="https://maps.googleapis.com/maps/api/js?key=AIzaSyCh39n5U-
4IoWpsVGUHWdqB6puEkhRLdmI&callback=myMap">
  </script>
  <!-- End Google Map -->

</body>

</html>
```

7.4: FEATURE 4:

Signup Algorithm:

1. Input the signup form fields (name , email , password , re-enter password).
2. All credentials are validated.
3. Website checks whether the given email exists in the database.
4. If already registered, notification is displayed. Or else, the user is taken to the login page.

CODE:

```
<!DOCTYPE html>
<html>

<head>
  <!-- Basic -->
  <meta charset="utf-8" />
  <meta http-equiv="X-UA-Compatible" content="IE=edge" />
  <!-- Mobile Metas -->
  <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no" />
  <!-- Site Metas -->
  <meta name="keywords" content="" />
  <meta name="description" content="" />
  <meta name="author" content="" />
  <link rel="shortcut icon" href="images/favicon.png" type="">

  <title>MJSP Predictor</title>

  <!-- bootstrap core css -->
```

```
  <link rel="stylesheet" type="text/css" href="css/bootstrap.css" />

  <!-- fonts style -->
  <link
href="https://fonts.googleapis.com/css2?family=Roboto:wght@400;500;
700;900&display=swap" rel="stylesheet">

  <!--owl slider stylesheet -->
  <link rel="stylesheet" type="text/css"
href="https://cdnjs.cloudflare.com/ajax/libs/OwlCarousel2/2.3.4/assets/o
wl.carousel.min.css" />

  <!-- font awesome style -->
  <link href="css/font-awesome.min.css" rel="stylesheet" />

  <!-- Custom styles for this template -->
  <link href="css/style.css" rel="stylesheet" />
  <!-- responsive style -->
  <link href="css/responsive.css" rel="stylesheet" />

</head>

<body class="sub_page">

  <div class="hero_area">
    <!-- header section strats -->
    <header class="header_section">
      <div class="container">
        <nav class="navbar navbar-expand-lg custom_nav-container ">
          <a class="navbar-brand" href="index.html">
            <span>
              MJSP Predictor
            </span>
          </a>

          <button class="navbar-toggler" type="button" data-
toggle="collapse" data-target="#navbarSupportedContent" aria-
```

```
controls="navbarSupportedContent" aria-expanded="false" aria-
label="Toggle navigation">
          <span class=""> </span>
        </button>

        <div class="collapse navbar-collapse"
id="navbarSupportedContent">
          <ul class="navbar-nav">
            <li class="nav-item">
              <a class="nav-link" href="index.html">Home </a>
            </li>
            <li class="nav-item">
              <a class="nav-link" href="about.html"> About</a>
            </li>
            <li class="nav-item">
              <a class="nav-link" href="/dashboard.html">Dashboard</a>
            </li>
            <li class="nav-item">
              <a class="nav-link" href="/report.html">Report</a>
            </li>
            <li class="nav-item active">
              <a class="nav-link" href="/story.html">Story<span class="sr-
only">(current)</span> </a>
            </li>
            <form class="form-inline">
              <button class="btn  my-2 my-sm-0 nav_search-btn"
type="submit">
                <i class="fa fa-search" aria-hidden="true"></i>
              </button>
            </form>
          </ul>
        </div>
      </nav>
    </div>
  </header>
```

```
  <!-- end header section -->
 </div>

 <!-- contact section -->
 <section class="contact_section layout_padding">
  <div class="container">
   <div class="heading_container">
    <h2>
     Get In Touch
    </h2>
   </div>
   <div class="row">
    <div class="col-md-6">
     <div class="form_container contact-form">
      <form action="">
       <div class="form-row">
        <div class="col-lg-6">
         <div>
          <input type="text" placeholder="Your Name" />
         </div>
        </div>
        <div class="col-lg-6">
         <div>
          <input type="text" placeholder="Phone Number" />
         </div>
        </div>
       </div>
       <div>
        <input type="email" placeholder="Email" />
       </div>
       <div>
        <input type="text" class="message-box"
placeholder="Message" />
       </div>
       <div class="btn_box">
```

```
            <button>
              SEND
            </button>
          </div>
        </form>
      </div>
    </div>
    <div class="col-md-6">
      <div class="map_container">
        <div class="map">
          <div id="googleMap"></div>
        </div>
      </div>
    </div>
  </div>
</div>
</section>
<!-- end contact section -->

<!-- footer section -->
<footer class="footer_section">
  <div class="container">
    <div class="row">
      <div class="col-md-6 col-lg-3 footer_col">
        <div class="footer_contact">
          <h4>
            Reach at..
          </h4>
          <div class="contact_link_box">
            <a href="">
              <i class="fa fa-map-marker" aria-hidden="true"></i>
              <span>
                Location
              </span>
            </a>
```

```
      <a href="">
        <i class="fa fa-phone" aria-hidden="true"></i>
        <span>
          Call +01 1234567890
        </span>
      </a>
      <a href="">
        <i class="fa fa-envelope" aria-hidden="true"></i>
        <span>
          demo@gmail.com
        </span>
      </a>
    </div>
  </div>
  <div class="footer_social">
    <a href="">
      <i class="fa fa-facebook" aria-hidden="true"></i>
    </a>
    <a href="">
      <i class="fa fa-twitter" aria-hidden="true"></i>
    </a>
    <a href="">
      <i class="fa fa-linkedin" aria-hidden="true"></i>
    </a>
    <a href="">
      <i class="fa fa-instagram" aria-hidden="true"></i>
    </a>
  </div>
</div>
<div class="col-md-6 col-lg-3 footer_col">
  <div class="footer_detail">
    <h4>
      About
    </h4>
    <p>
```

Beatae provident nobis mollitia magnam voluptatum, unde dicta facilis minima veniam corporis laudantium alias tenetur eveniet illum reprehenderit fugit a delectus officiis blanditiis ea.

```
          </p>
        </div>
      </div>
      <div class="col-md-6 col-lg-2 mx-auto footer_col">
        <div class="footer_link_box">
          <h4>
            Links
          </h4>
          <div class="footer_links">
            <a class="" href="index.html">
              Home
            </a>
            <a class="" href="about.html">
              About
            </a>
            <a class="" href="/dashboard.html">
              Dashboard
            </a>
            <a class="" href="/report.html">
              Report
            </a>
            <a class="active" href="/story.html">
              Story
            </a>
          </div>
        </div>
      </div>
      <div class="col-md-6 col-lg-3 footer_col ">
        <h4>
          Newsletter
        </h4>
        <form action="#">
```

```
          <input type="email" placeholder="Enter email" />
          <button type="submit">
            Subscribe
          </button>
        </form>
      </div>
    </div>
    <div class="footer-info">
      <p>
        &copy; <span id="displayYear"></span> All Rights Reserved By
MJSP Predictor<br><br>
      </p>
    </div>
  </div>
 </footer>
 <!-- footer section -->

 <!-- jQery -->
 <script type="text/javascript" src="js/jquery-3.4.1.min.js"></script>
 <!-- popper js -->
 <script
src="https://cdn.jsdelivr.net/npm/popper.js@1.16.0/dist/umd/popper.min
.js" integrity="sha384-
Q6E9RHvbIyZFJoft+2mJbHaEWldlvI9IOYy5n3zV9zzTtmI3UksdQRV
voxMfooAo" crossorigin="anonymous">
 </script>
 <!-- bootstrap js -->
 <script type="text/javascript" src="js/bootstrap.js"></script>
 <!-- owl slider -->
 <script type="text/javascript"
src="https://cdnjs.cloudflare.com/ajax/libs/OwlCarousel2/2.3.4/owl.caro
usel.min.js">
 </script>
 <!-- custom js -->
 <script type="text/javascript" src="js/custom.js"></script>
```

```
  <!-- Google Map -->
  <script
src="https://maps.googleapis.com/maps/api/js?key=AIzaSyCh39n5U-
4IoWpsVGUHWdqB6puEkhRLdmI&callback=myMap">
  </script>
  <!-- End Google Map -->

</body>

</html>
```

7.5: DATABASE SCHEMA:

NoSQL databases like MongoDB offer high performance, high availability, and easy scalability. MongoDB is a documentoriented database which stores data in JSON-like documents with dynamic schema. It means you can store your records without worrying about the data structure such as the number of fields or types of fields to store values. MongoDB documents are similar to JSON objects. Details like name, e-mail, password of the registered user are stored so that when the user tries to login, authentication takes place and the user is logged in.

CHAPTER 8
TESTING

8.1: TEST CASES:

Testcase 1: Logging in with registered login details.
Testcase 2: Logging in with invalid login details.

Testcase 3: Registering with existing user's details.
Testcase 4: Entering wrong values while filling medical related details.
Testcase 5: Producing visualisations for given input.

8.2: USER ACCEPTANCE TESTING:

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with invalid credentials	User credentials, Database with credentials of existing users	1.Enter URL(https://shopenzer.com/) and click go 2.Click on My Account dropdown button 3.Enter inValid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: chalam@gmail password: Testing123	Application should show 'Incorrect email or password ' validation message.	Working as expected	Fail	Login failed due to incorrect login details or user not registered	N	4
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with inValid credentials	User credentials, Database with credentials of existing users	1.Enter URL(https://shopenzer.com/) and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter invalid password in password text box 5.Click on login button	Username: chalam@gmail.com password: Testing1236786867868768 76	Application should show 'Incorrect email or password ' validation message.	Working as expected	Fail	Login failed due to incorrect login details or user not registered	N	5
LoginPage_TC_OO5	Functional	Login page	Verify user is able to log into application with inValid credentials	User credentials, Database with credentials of existing users	1.Enter URL(https://shopenzer.com/) and click go 2.Click on My Account dropdown button 3.Enter inValid username/email in Email text box 4.Enter invalid password in password text box	Username: chalam password: Testing1236786867868768 76	Application should show 'Incorrect email or password ' validation message.	Working as expected	Fail	Login failed due to incorrect login details or user not registered	N	6

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with invalid credentials	User credentials, Database with credentials of existing users	1.Enter URL(https://shopenzer.com/) and click go 2.Click on My Account dropdown button 3.Enter inValid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: chalam@gmail password: Testing123	Application should show 'Incorrect email or password ' validation message.	Working as expected	Fail	Login failed due to incorrect login details or user not registered	N	4
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with inValid credentials	User credentials, Database with credentials of existing users	1.Enter URL(https://shopenzer.com/) and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter invalid password in password text box 5.Click on login button	Username: chalam@gmail.com password: Testing1236786867868768 76	Application should show 'Incorrect email or password ' validation message.	Working as expected	Fail	Login failed due to incorrect login details or user not registered	N	5
LoginPage_TC_OO5	Functional	Login page	Verify user is able to log into application with inValid credentials	User credentials, Database with credentials of existing users	1.Enter URL(https://shopenzer.com/) and click go 2.Click on My Account dropdown button 3.Enter inValid username/email in Email text box 4.Enter invalid password in password text box	Username: chalam password: Testing1236786867868768 76	Application should show 'Incorrect email or password ' validation message.	Working as expected	Fail	Login failed due to incorrect login details or user not registered	N	6

CHAPTER 9

RESULTS

9.1 PERFORMANCE METRICS

1. Hours worked: 50 hours
2. Stick to Timelines: 100%
3. Stay within budget: 100%
4. Consistency of the product: 85%

5. Efficiency of the product: 85%
6. Quality of the product: 85%

CHAPTER 10
ADVANTAGES & DISADVANTAGES

ADVANTAGES:

Smooth User Interface

Accuracy is achieved quickly

DISADVANTAGES:

Random forest can be used for both classification and regression tasks, but it is not more suitable for Regression tasks.

CHAPTER 11

CONCLUSION

This overview of the project conveys the idea that numerous methods have been investigated for diagnosing cardiovascular disease. Big data, machine learning, and data mining can be used to great success to analyse the prediction model with the highest degree of accuracy. The primary goal of this project is to diagnose cardiovascular disease or heart disease utilizing a variety of techniques and procedures to obtain a prognosis.

CHAPTER 12

FUTURE SCOPE

A future update shall comprise of section for viewing renowned cardiologists and scan centres in their city. The obtained output can be further processed and sent to smart devices to provide necessary assistance. Constant monitoring can provide necessary data to recommend to consult a doctor in case of an emergency.

CHAPTER 13

APPENDIX PROJECT DEMONSTRATION LINK: https://drive.google.com/file/d/1JrlNHy6tuSsa3mDX_cRd4xQO7q4RjFXp/view?usp=share_link

GITHUB LINK: https://github.com/IBM-EPBL/IBM-Project-53957-1661583912