Visualizing and Predicting Heart Diseases with an Interactive Dash Board

INTRODUCTION

1.1 Project Overview:

The leading cause of death in the developed world is heart disease. Therefore, there needs to be work done to help prevent the risks of having a heart attack or stroke. We will be working with the heart disease prediction and for that, we will be looking into the heart disease dataset. From that dataset we will derive various insights that help us know the weightage of each feature and how they are interrelated to each other. Main aim is to detect the probability of a person that will be affected by a savior heart problem or not.

1.2 Purpose:

Heart is one the most vital organs in the human body. When we talk about heart diseases, we can have multiple conditions where the heart is not working the way it should be like blockage in blood vessels. According to many researches that have been conducted through a period of time have found out that heart failure and heart disease has been the cruel cause of death in human beings. What aggravates this situation is that most of these diseases are being diagnosed at later stages at which it is very difficult to control. But if somehow, we can diagnose these diseases at its early stage, then we can surely cure the disease

1. LITERATURE SURVEY

2.1 Existing problem:

In this system, the input details are obtained

from the patient. Then from the user inputs,using ML techniques heart disease is analyzed.

Now, the obtained results are compared with the results of existing models within the same domain and found to be improved. The data of heart disease patients collected from the UCI laboratory is used to discover patterns with NN,DT, Support Vector machines SVM, and Naive Bayes. The results are compared for performance and accuracy with these

algorithms. The proposed hybrid method returns results of 87% for F-measure, competing with the other existing methods.

2.2 References:

- V. Manikantan & S.Latha,"Predicting the Analysis of Heart Disease Symptoms Using Medicinal Data Mining Methods", International Journalon Advanced Computer Theory and Engineering, Volume-2, Issue-2, 2013.
- Dr.A.V.Senthil Kumar, "Heart Disease Prediction Using Data Mining preprocessing and Hierarchical Clustering", International Journal of
- Advanced Trends in Computer Science and Engineering, Volume-4, No.6, 2015.
- Uma.K, M.Hanumathappa, "Heart Disease Prediction Using Classification Techniques with Feature Selection Method", Adarsh Journal of
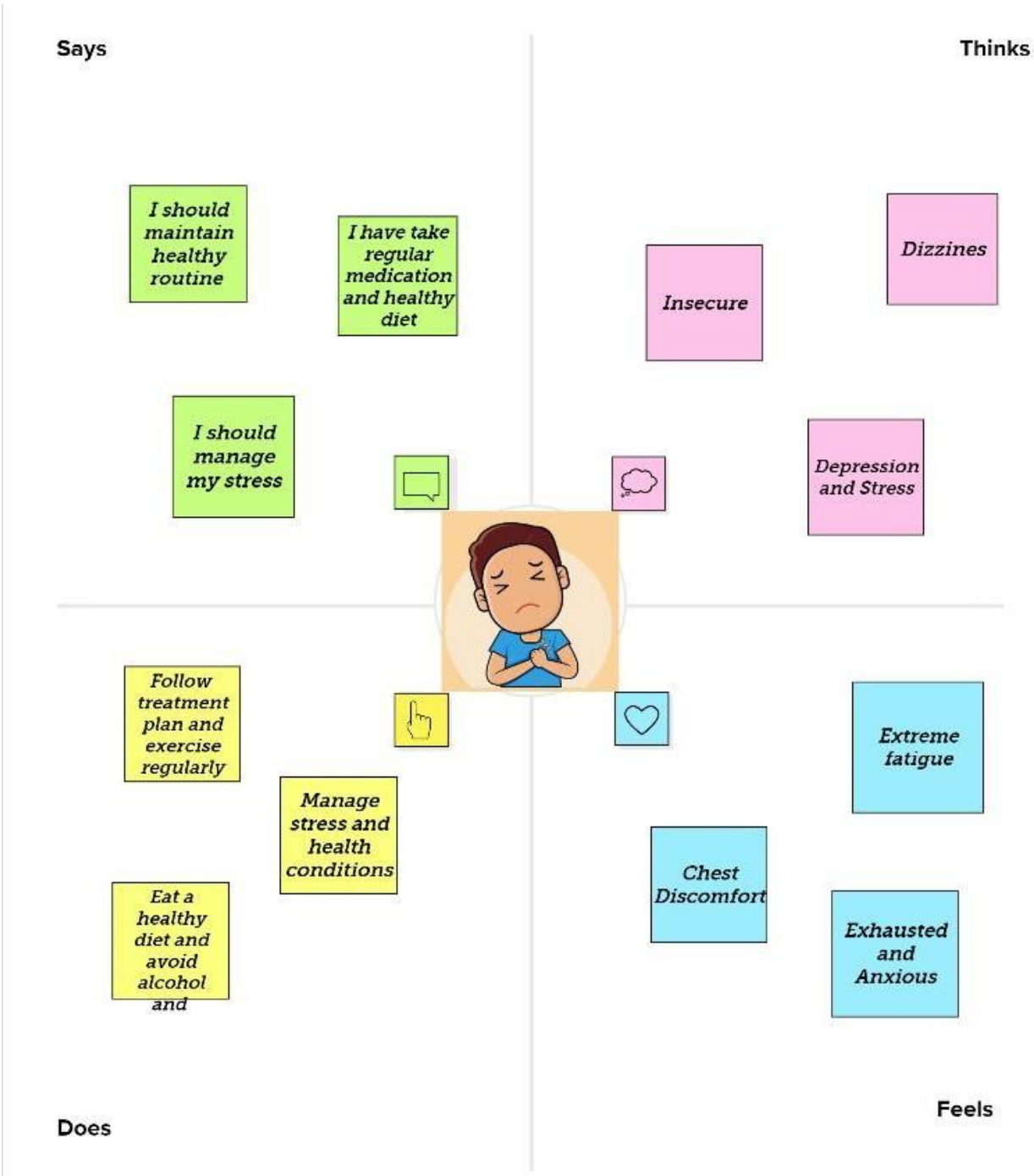
- Information Technology, Volume-5, Issue-2,

- Himanshu Sharma, M.A.Rizvi, "Prediction of Heart Disease using Machine Learning Algorithms:A Survey",International Journal on Recent

- and Innovation Trends in Computing and Communication,Volume5,Issue-8

- S.Ghwanmeh,A.Mohammad,andA.Al-Ibrahim,"Innovative artificial neural networks-based decision support system for heart diseases diagnosis,"Journal of Intelligent Learning Systems and Application.

- Q. K. Al-Shayea, "Artificial neural networks in medical diagnosis," International Journal of Computer Science Issues, vol. 8, no. 2, 2011.

- K. Vanisree and J. Singaraju, "Decision support system for congenital heart disease diagnosis based on signs and symptoms using neural networks," International Journal of Computer Applications, vol. 19, no. 6, pp. 6–12, 2011.

- Al Mamoon I, Sani AS, Islam AM, Yee OC, Kobayashi F, Komaki S (2013) A proposal of body implementable early heart attack detection system, 1-4.

2.3 Problem Statement Definition:

we will be working with the heart disease prediction and for that, we will be looking into the heart disease dataset from that dataset we will derive various insights that help us know the weightage of each feature and how they are interrelated to each other. Main aim is to detect the probability of person that will be affected by a savior heart problem or not.

2. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas:

Says

Thinks

I should maintain healthy routine

I have take regular medication and healthy diet

Insecure

Dizzines

I should manage my stress

Depression and Stress

Does

Follow treatment plan and exercise regularly

Manage stress and health conditions

Eat a healthy diet and avoid alcohol and

Extreme fatigue

Chest Discomfort

Exhausted and Anxious

Feels

3.2 Ideation & Brainstorming:

3.3 Proposed Solution:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	To develop an interactive dashboard to predict the heart disease accurately with few tests and attributes the presence of heart disease.
2.	Idea / Solution description	Analysing data and identifying the heart disease using Cognos analysis.
3.	Innovation	Hoping to achieve maximum accuracy to provide prior treatment to the patients and reduce the fatality rate.
4.	Social Impact / Customer Satisfaction	Reduces the exorbitant medical cost the patients.

		Reduces the biases and mistakes caused by the decisions of doctors based on their intuitions and experiences.
5.	Business Model (Revenue Model)	Data security. Easy to use. Constant updates according to necessity.
6.	Scalability of the Solution	Can be used in any platform (Windows, mac, etc.,). Adding new feature doesn't affect the performance of the system.

3.4 Prblem Solution fit:

3. REQUIREMENT ANALYSIS

4.1 Functional requirement:

Following are the functional requirements proposed solution.

FR NO	Functional Requirement(Epic)	Sub Requirement(Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through gmail Registration through Linkedin
FR-2	User confirmation	Confirmation via email Confirmation via OTP
FR-3	User Verification	Verification through Captcha (verify through "I am not a robot")
FR-4	Visualizing Data	User can visualize the trends on the heart Disease through Dashboard created using IBM Cognos Analytics
FR-5	Generating Report	User can view his/her health report and can

		make decisions accordingly

4.2 Non-Functional requirements

Following are the non-functional requirements of the proposed solution

NFR-4	**Performance**	Relaying should be performed quickly. This prediction system should be made available in the cloud to make it easier to use and to set a new standard for affordable, high-quality healthcare.
NFR-5	**Availability**	The application has to be available 24 x 7 for users without any interruption.
NFR-6	**Scalability**	It is determined by the number of people who maintain the software or system based on its performance, such as workflow, efficiency increase or decrease, response time, etc. Maintenance, checking for software updates, and fixing server errors can all be measures of its scalability.

4. PROJECT DESIGN

5.1 Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD 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.
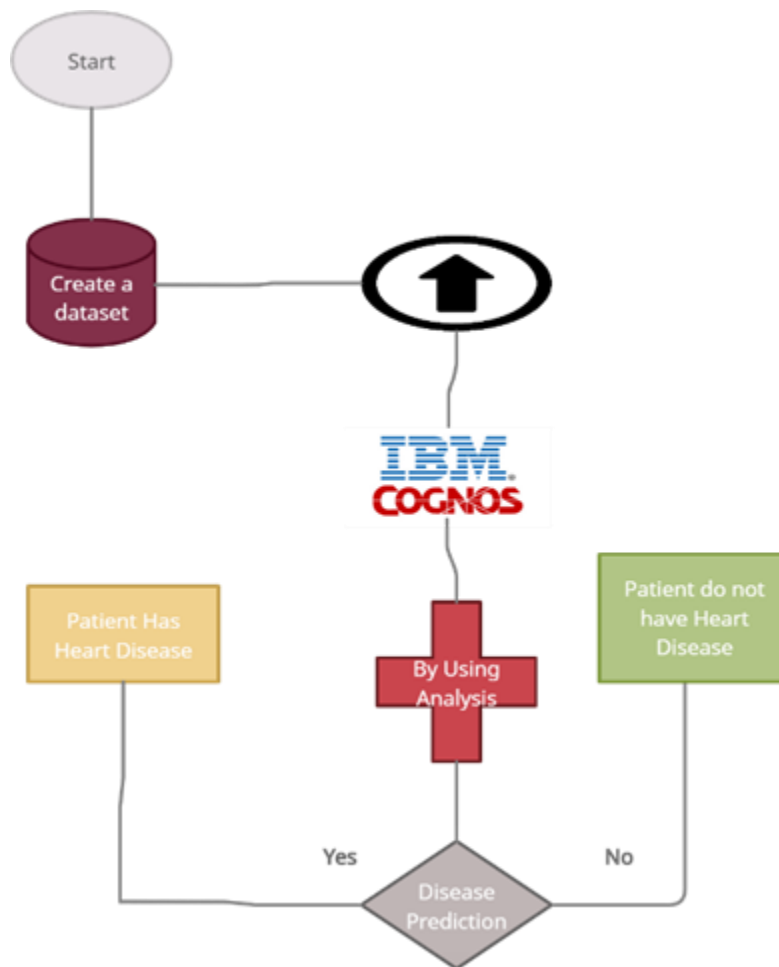
5.2 Solution & Technical Architecture:
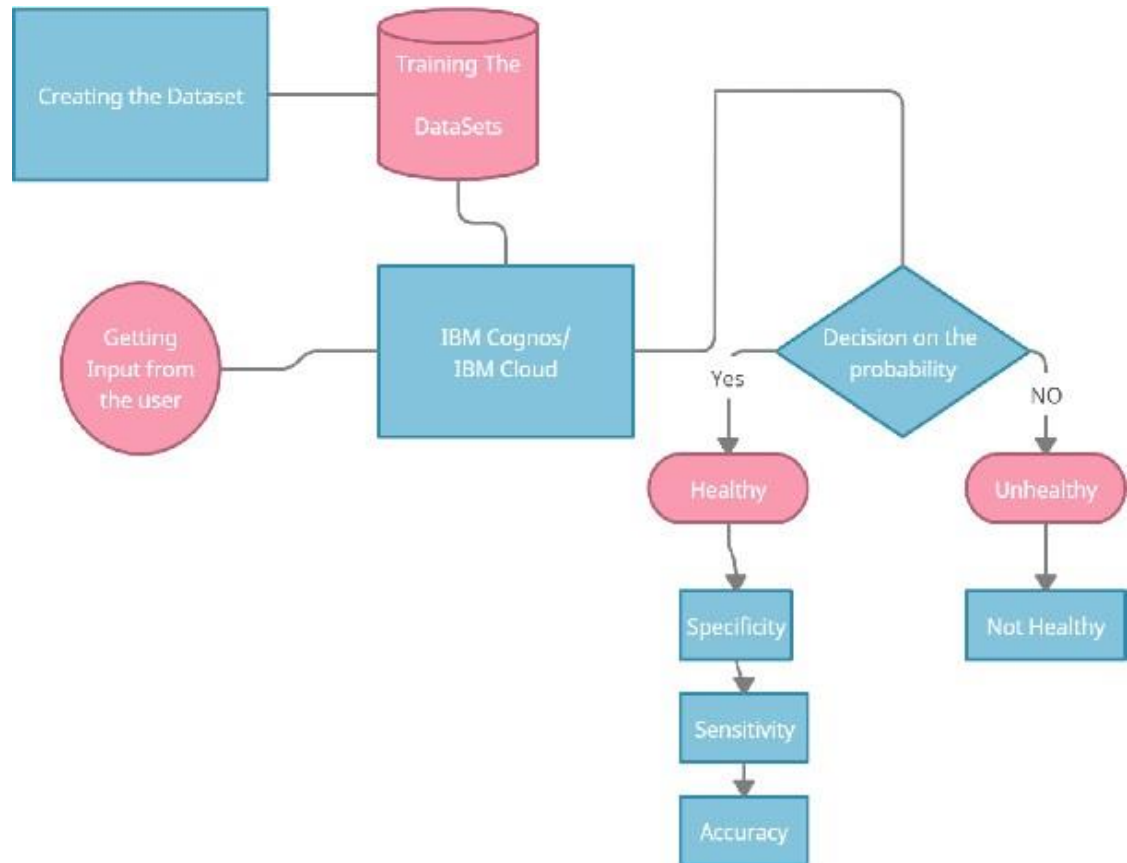
Technology Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1

User   Data Sets   IBM COGNOS   Admin

Input   Heart Disease   Data import

Data cleansing   Data distribution and relationships   Data explored and deployed

Data exploration
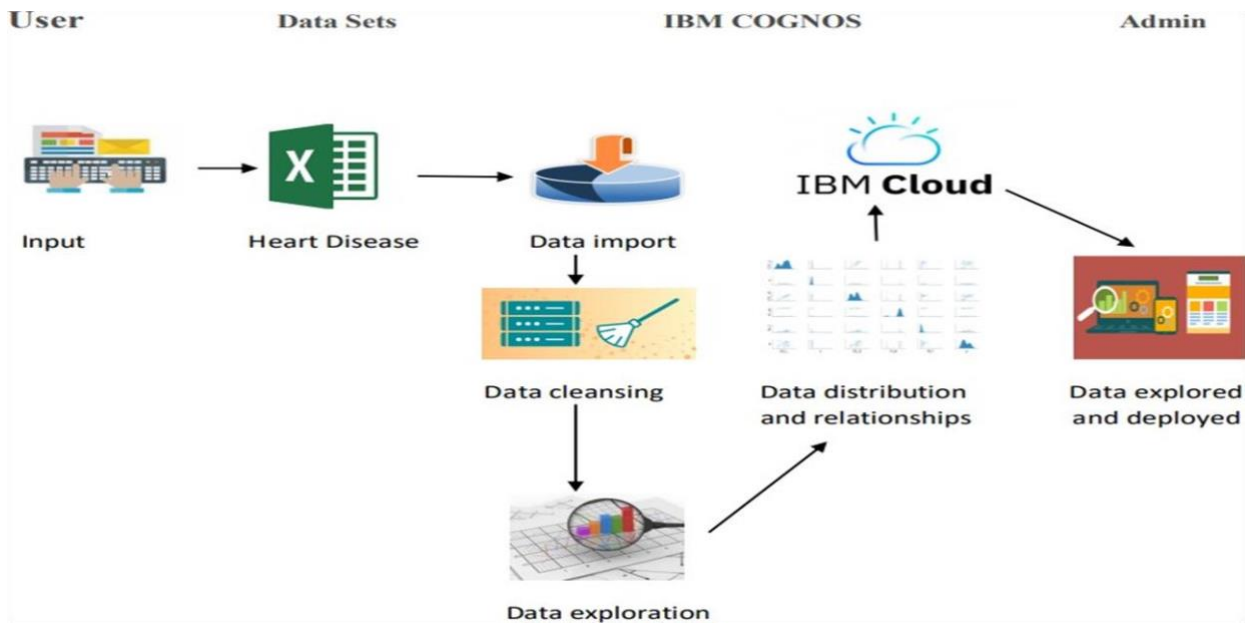
Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g., Web UI,	IBM Cognos / Python.
2.	Data Set	The data set prepared for heart disease	Python.
3.	IBM Cognos	Data analytics platform	IBM Watson service
4.	Data Import	Data set is imported in IBM Cognos	IBM Watson Assistant
5.	Data Cleaning	Data is cleaned by using some mathematical techniques such as mean, mode etc.to clean the null	IBM Assistant
6.	Data Exploration	Cleaned data can be explored.	IBM Cognos
7.	Story Card	Data is explored and story card was prepared for visual	IBM Cognos
8.	IBM Cloud	Storage of data	IBM DB2
9.	Data Explored and Deployed	Purpose of External API to explored and deployed	Data deployed to user by UI
10.	Admin	Purpose of Data set model	Recognition of data set model etc.

5.3 User Stories

User Type	User Story / Task	Acceptance criteria	Release
	View Doctors - view doctor detail by searching by names or filter by specialty	Using this application, people can known that the speciality doctors.	Sprint-1
Customer (Web user)	Hardware Requirement Laptop or PC I5 processor system or higher 4 GB RAM or higher 128 GB ROM or higher ii. Android Phone (12.0 and above)	These are all the specification available in your PC.	Sprint-2
	Reference- https://ieeexplore.ieee.org/document/9619208/	Go and Check our Reference link.	Sprint-1

Customer Care Executive	Query	You can post your queries in the text box available in that application.	Sprint-1
	Toll Free	Ask your doubts in given number(8365492107).	Sprint-1
	Ratings	Give your ratings as your wish.	Sprint-1
Administrator	Verification	Verification through CAPTCHA Verification through I'm not a robot	Sprint-1
	validation	Reconfirming the new password Sending a two digit number in (Google account) your Old devices, so that you can enter into a new device	Sprint-2

User Type	User Story / Task	Acceptance criteria	Release
		By entering the two digit number.	
	Feedback - send feedback to the Admin.	Please send your feedback to host.	Sprint-2

5. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation:

Sprint	Total Story Point	Sprint Start Date	Sprint End Date (Planned)	Story Points Comple	Sprint Release Date (Actual)
Sprint-1	20	15 Oct 2022	18 Oct 2022	20	20 Oct 2022
Sprint-2	20	21 Oct 2022	23 Nov 2022	17	23 Nov 2022
Sprint-3	20	01 Nov 2022	03 Nov 2022	18	04 Nov 2022
Sprint-4	20	10 Nov 2022	14 Nov 2022	19	17 Nov 2022

6.2 Sprint Delivery Schedule

Product Backlog, Sprint Schedule, and Estimation

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story	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	3	High	Subiksha TS A prema
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	3	High	Dharshini V Velmani.B
Sprint-1		USN-3	As a user, I can register for the application through Facebook	5	Low	Subiksha T S Velmani B Prema A
Sprint-1		USN-4	As a user, I can register for the application through Gmail	3	Medium	Dharshini V Prema A
Sprint-1	Login	USN-5	As a user, I can log into the application by	6	High	Dharshini V Subiksha TS
Sprint-2	Dashboard	USN-6	Attractive dashboard For the Application	3	Medium	Prema v
Sprint-2		USN-7	Profile - view & update your profile	5	Low	Velmani B Subiksha TS
Sprint-2		USN-8	Home - Analyze your Heart problem	2	High	Dharshni V Prema A

Sprint-2		USN-9	User fill the details to predict the disease	7	High	Subiksha TS Prema A
Sprint-3	Support	USN-10	Get feedback from users	1 0	Medium	Dharshini V Velmani B Prema A
Sprint-3		USN-11	Responds to user queries via telephone,email etc.	3	Medium	Subiksha TS Velmani B Dharshini v
Sprint-3		USN-12	The team must respond immediately to the queries based	5	High	Prema A Velmani B
Sprint-4	System Requirements	USN-13	Hardware Requirement 1. Laptop or PC • i5 processor system or higher • 4 GB RAM or higher • 128 GB ROM or higher	5	Low	Subiksha TS Velmani B Dharshini V Prema A
Sprint-4		USN-14	Software Requirement 1. Laptop or PC • Windows 10 or higher Android Studio	8	Medium	Subiksha TS Velmani B Dharshini V Prema A

6.3 Reports from JIRA:

6. CODING & SOLUTIONING

7.1 Feature 1

Login page code:

HTML code:

```html
<!DOCTYPE html>

<!-- Created By CodingNepal -->

<html lang="en" dir="ltr">
```

```html
<meta charset="utf-8">

<title>Login and Registration Form in HTML | CodingNepal</title>

<link rel="stylesheet" href="css.css">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

</head>

<body>

  <div class="wrapper">

    <div class="title-text">

      <div class="title login">

        Login Form

      </div>

      <div class="title signup">

        Signup Form

      </div>

    </div>

    <div class="form-container">

      <div class="slide-controls">

        <input type="radio" name="slide" id="login" checked>

        <input type="radio" name="slide" id="signup">
```

```html
        <label for="login" class="slide login">Login</label>

        <label for="signup" class="slide signup">Signup</label>

        <div class="slider-tab"></div>

    </div>

    <div class="form-inner">

        <form action="#" class="login">

            <div class="field">

                <input type="text" placeholder="Email Address" required>

            </div>

            <div class="field">

                <input type="password" placeholder="Password" required>

            </div>



            <div class="field btn">

                <div class="btn-layer"></div>

                <input type="submit" value="Login">

            </div>

            <div class="signup-link">

                Not a member? <a href="">Signup now</a>
```

```html
                </div>

            </form>

            <form action="#" class="signup">

                <div class="field">

                    <input type="text" placeholder="Email Address" required>

                </div>

                <div class="field">

                    <input type="password" placeholder="Password" required>

                </div>

                <div class="field">

                    <input type="password"  placeholder="Confirm  password"
required>

                </div>

                <div class="field btn">

                    <div class="btn-layer"></div>

                    <input type="submit" value="Signup">

                </div>

            </form>

        </div>

    </div>
```

```
</div>

<script>

  const loginText = document.querySelector(".title-text .login");

  const loginForm = document.querySelector("form.login");

  const loginBtn = document.querySelector("label.login");

  const signupBtn = document.querySelector("label.signup");

  const signupLink = document.querySelector("form .signup-link a");

  signupBtn.onclick = (()=>{

    loginForm.style.marginLeft = "-50%";

    loginText.style.marginLeft = "-50%";

  });

  loginBtn.onclick = (()=>{

    loginForm.style.marginLeft = "0%";

    loginText.style.marginLeft = "0%";

  });

  signupLink.onclick = (()=>{

    signupBtn.click();

    return false;

  });
```

```
   </script>

  </body>
```

CSS code:

```css
@import
url('https://fonts.googleapis.com/css?family=Poppins:400,50
0,600,700&display=swap');

*{

  margin: 0;

  padding: 0;

  box-sizing: border-box;

  font-family: 'Poppins', sans-serif;

}

.

  w
```

```css
  background-position: center;

  background-size: cover;

  position: absolute;

}


html,body{

  display: grid;

  height: 100%;

  width: 100%;

  place-items: center;

  background-image: url('banner.jpg');

  position:absolute;

  background-repeat: repeat;

  background-size:60% ;


}
::selection{

  background: #fa4299;

  color: #fff;
```

```css
}

.wrapper{

  overflow: hidden;

  max-width: 390px;

  background: #fff;

  padding: 30px;

  border-radius: 5px;

  box-shadow: 0px 15px 20px rgba(0,0,0,0.1);

}

.wrapper .title-text{

  display: flex;

  width: 200%;

}

.wrapper .title{

  width: 50%;

  font-size: 35px;

  font-weight: 600;

  text-align: center;

  transition: all 0.6s cubic-bezier(0.68,-0.55,0.265,1.55);
```

```css
}
.wrapper .slide-controls{

  position: relative;

  display: flex;

  height: 50px;

  width: 100%;

  overflow: hidden;

  margin: 30px 0 10px 0;

  justify-content: space-between;

  border: 1px solid lightgrey;

  border-radius: 5px;
}
.slide-controls .slide{

  height: 100%;

  width: 100%;

  color: #fff;

  font-size: 18px;

  font-weight: 500;

  text-align: center;
```

```css
  line-height: 48px;

  cursor: pointer;

  z-index: 1;

  transition: all 0.6s ease;

}

.slide-controls label.signup{

  color: #000;

}

.slide-controls .slider-tab{

  position: absolute;

  height: 100%;

  width: 50%;

  left: 0;

  z-index: 0;

  border-radius: 5px;

  background: -webkit-linear-gradient(left, #a445b2, #fa4299);

  transition: all 0.6s cubic-bezier(0.68,-0.55,0.265,1.55);

}

input[type="radio"]{
```

```css
  display: none;

}

#signup:checked ~ .slider-tab{

  left: 50%;

}

#signup:checked ~ label.signup{

  color: #fff;

  cursor: default;

  user-select: none;

}

#signup:checked ~ label.login{

  color: #000;

}

#login:checked ~ label.signup{

  color: #000;

}

#login:checked ~ label.login{

  cursor: default;

  user-select: none;
```

```css
}

.wrapper .form-container{

  width: 100%;

  overflow: hidden;

}

.form-container .form-inner{

  display: flex;

  width: 200%;

}

.form-container .form-inner form{

  width: 50%;

  transition: all 0.6s cubic-bezier(0.68,-0.55,0.265,1.55);

}

.form-inner form .field{

  height: 50px;

  width: 100%;

  margin-top: 20px;

}

.form-inner form .field input{
```

```css
    height: 100%;

    width: 100%;

    outline: none;

    padding-left: 15px;

    border-radius: 5px;

    border: 1px solid lightgrey;

    border-bottom-width: 2px;

    font-size: 17px;

    transition: all 0.3s ease;

}

.form-inner form .field input:focus{

    border-color: #fc83bb;

    /* box-shadow: inset 0 0 3px #fb6aae; */

}

.form-inner form .field input::placeholder{

    color: #999;

    transition: all 0.3s ease;

}

form .field input:focus::placeholder{
```

```css
  color: #b3b3b3;

}

.form-inner form .pass-link{

  margin-top: 5px;

}

.form-inner form .signup-link{

  text-align: center;

  margin-top: 30px;

}

.form-inner form .pass-link a,

.form-inner form .signup-link a{

  color: #fa4299;

  text-decoration: none;

}

.form-inner form .pass-link a:hover,

.form-inner form .signup-link a:hover{

  text-decoration: underline;

}

form .btn{
```

```css
  height: 50px;

  width: 100%;

  border-radius: 5px;

  position: relative;

  overflow: hidden;

}

form .btn .btn-layer{

  height: 100%;

  width: 300%;

  position: absolute;

  left: -100%;

  background: -webkit-linear-gradient(right, #a445b2, #fa4299, #a445b2, #fa4299);

  border-radius: 5px;

  transition: all 0.4s ease;;

}

form .btn:hover .btn-layer{

  left: 0;

}

form .btn input[type="submit"]{
```

```css
height: 100%;

width: 100%;

z-

index:

1;

positi

on:

relativ

e;

backg

round:
```

Index page code:

```html
<!DOCTYPE html>
<html lang="en">
<head>
```

```html
    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <link rel="stylesheet" href="./index.css">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Document</title>

</head>

<body>

    <div class="container">

        <img src="https://play-lh.googleusercontent.com/qSx3mGMLZGDuFDgJT3Ao2qXwy-peiuthB80OvuWUg576646TzW0jXr7_VhI1PYj_XaU=w240-h480-rw" height="50px" width="50px" alt="">

        <nav>

            <ol>

                <a href="./dashboard.html" target="_blank"><li>Dashboard</li></a>

                <a href="./report.html" ><li>Report</li></a>

                <a href="./story.html"><li>Story</li></a>

                <a href="./contact_us.html"><li>Contact Us</li></a>

            </ol>

        </nav>
```

```html
    </div>

    <div class="back">

        <div class="text-content">

            <h1 class="one">Heart Disease Predication Using

                <h2 class="two">

                    Visualization and Dashboard

                </h2>

            </h1>

        </div>

    </div>
```

7.2 Feature 2

Dashboard page Code:

```html
<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">
```

```html
<meta http-equiv="X-UA-Compatible" content="IE=edge">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<title>Dashboard</title>
</head>

<style>

  *{

    margin: 0;padding: 0;

    list-style: none;

  }

  .container{

  display: flex;

  height: 70px;

  justify-content: space-between ;

  align-items: center;

  padding: 0 10%;

  background: rgb(4, 4, 125);

}

ol{

  display: flex;
```

```css
}

ol a{

    border-radius: 5px;

    padding: 8px 20px;

    margin-left: 10px;

    font-size: 16px;

    color: white;

    font-size: 18px;

    letter-spacing: 1px;

    cursor: pointer;

    text-decoration: none;

    transition: all 0.8s;

}

ol .active,

ol a:hover{

    background: white;

    color: black;

}

</style>
```

```html
<body>

  <div class="container">

    <img                                          src="https://play-
lh.googleusercontent.com/qSx3mGMLZGDuFDgJT3Ao2qXwy-
peiuthB80OvuWUg576646TzW0jXr7_VhI1PYj_XaU=w240-h480-rw"
height="50px" width="50px" alt="">

    <nav>

      <ol>

        <a                                              href="./dashboard.html"
class="active"target="_blank"><li>Dashboard</li></a>

          <a href="./report.html" ><li>Report</li></a>

          <a href="./story.html"><li>Story</li></a>

          <a href="./dashboard.html"><li>Contact Us</li></a>

      </ol>

    </nav>


  </div>

  <div class="back">

    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;
pathRef=.my_folders%2Fproject_heart&amp;closeWindowOnLastView=
true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=em
```

```
bedded&amp;action=view&amp;mode=dashboard&amp;su
bView=model0000018465861322_00000002"
                                        width="100%"
                                        height="700px"
frameborder="0"          gesture="media"
                         allow="encrypted-media"
allowfullscreen=""></iframe>
```

Report page Code:

```
<!DOCTYPE html>
```

```
<html lang="en">

<head>

  <meta charset="UTF-8">

  <meta                    content="width=device-     initia
          name="vie

  <title>Document</t
  itle>

</head>

<style>

  *{
```

```css
    }
    .container{
    display: flex;
    height: 70px;
    justify-content: space-between ;
    align-items: center;
    padding: 0 10%;
    background: rgb(4, 4, 125);
}
ol{
    display: flex;
}
ol a{
    border-radius: 5px;
    padding: 8px 20px;
    margin-left: 10px;
    font-size: 16px;
    color: white;
    font-size: 18px;
```

```css
    letter-spacing: 1px;

    cursor: pointer;

    text-decoration: none;

    transition: all 0.8s;

}

ol .active,

ol a:hover{

    background: white;

    color: black;

}

</style>
```

```html
<body>

  <div class="container">

    <img                                             src="https://play-
lh.googleusercontent.com/qSx3mGMLZGDuFDgJT3Ao2qXwy-
peiuthB80OvuWUg576646TzW0jXr7_VhI1PYj_XaU=w240-h480-rw"
height="50px" width="50px" alt="">

    <nav>

      <ol>

        <a                                          href="./dashboard.html"
target="_blank"><li>Dashboard</li></a>
```

```html
        <a href="./report.html" class="active"
        ><li>Report</li></a>

        <a href="./story.html"><li>Story</li></a>

        <a href="./contact_us.html"><li>Contact
        Us</li></a>

</ol>

</nav>


    </div>

    <div class="back">
```

Story page code:

```html
<!DOCTYPE html>
<html lang="en">
```

```html
<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Document</title>

</head>

<style>

    *{

        margin: 0;padding: 0;

        list-style: none;

    }

    .container{

    display: flex;

    height: 70px;

    justify-content: space-between ;

    align-items: center;

    padding: 0 10%;

    background: rgb(4, 4, 125);

}
```

```css
ol{

    display: flex;

}

ol a{

    border-radius: 5px;

    padding: 8px 20px;

    margin-left: 10px;

    font-size: 16px;

    color: white;

    font-size: 18px;

    letter-spacing: 1px;

    cursor: pointer;

    text-decoration: none;

    transition: all 0.8s;

}

ol .active,

ol a:hover{

    background: white;

    color: black;
```

```html
}

</style>

<body>

  <div class="container">

    <img                                    src="https://play-
lh.googleusercontent.com/qSx3mGMLZGDuFDgJT3Ao2qXwy-
peiuthB80OvuWUg576646TzW0jXr7_VhI1PYj_XaU=w240-h480-rw"
height="50px" width="50px" alt="">

    <nav>

      <ol>

        <a                                    href="./dashboard.html"
target="_blank"><li>Dashboard</li></a>

          <a href="./report.html" ><li>Report</li></a>

          <a href="./story.html" class="active"><li>Story</li></a>

          <a href="./contact_us.html"><li>Contact Us</li></a>

      </ol>

    </nav>


  </div>

  <div class="back">
```

```html
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=story
&amp;pathR
ef=.my_folders%2Fheart_disease_story&amp;closeWindow
OnLastView
=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;sh
areMode=e
mbedded&amp;action=view&amp;sceneId=model00000184
6cd456a3_00000000&amp;sceneTime=5000"
                        width="100%" height="720px"
frameborder="0"            gesture="media"
```

Contact page code:

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

```html
<html lang="en">

<head>

  <meta charset="UTF-8">

  <meta                    content="width=device-      initia
            name="vie

  <title>Contact</t
  itle>

</head>
```

```css
*{
    margin: 0;padding: 0;
    list-style: none;
}
.container{
display: flex;
height: 70px;
justify-content: space-between ;
align-items: center;
padding: 0 10%;
background: rgb(13, 66, 191);
}
ol{
    display: flex;
}
ol a{
    border-radius: 5px;
    padding: 8px 20px;
    margin-left: 10px;
```

```css
        font-size: 16px;

        color: white;

        font-size: 18px;

        letter-spacing: 1px;

        cursor: pointer;

        text-decoration: none;

        transition: all 0.8s;
}
ol .active,

ol a:hover{

        background: white;

        color: black;
}
.team_member{

        display: flex;

        align-items: center;

        justify-content: center;

        height: 90vh;

        background: rgb(25, 6, 232);
```

```css
}

.member_name{

    color: #fff;

    font-size: 24px;

    display: flex;

    flex-direction: column;

    letter-spacing: 1px;

    cursor: pointer;

}

</style>
```

```html
<body>

    <div class="container">

        <img                                          src="https://play-
lh.googleusercontent.com/qSx3mGMLZGDuFDgJT3Ao2qXwy-
peiuthB80OvuWUg576646TzW0jXr7_VhI1PYj_XaU=w240-h480-rw"
height="50px" width="50px" alt="">

        <nav>

            <ol>

                <a                                  href="./dashboard.html"
target="_blank"><li>Dashboard</li></a>

                <a href="./report.html" ><li>Report</li></a>
```

```html
            <a href="./story.html"><li>Story</li></a>

            <a     href="./contact_us.html"     class="active"><li>Contact
Us</li></a>

        </ol>

    </nav>

  </div>

  <div class="team_member">

    <ol class="member_name">

      <li>subiksha-tssubiksha2001@gmail.com</li>

      <li>velmani-velvsvelu@gmail.com</li>

      <li>Aprema -premaarumugam2002@gmail.com</li>

      <li>Dharshini v-dharshininandhan1321@gmail.com</li>

    </ol>

  </div>
</body>
</html>
```
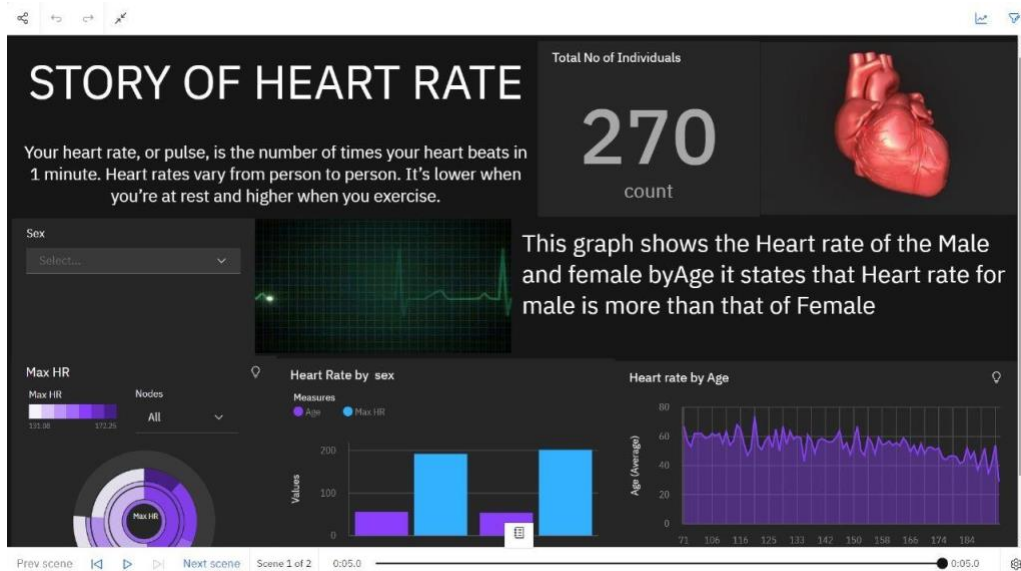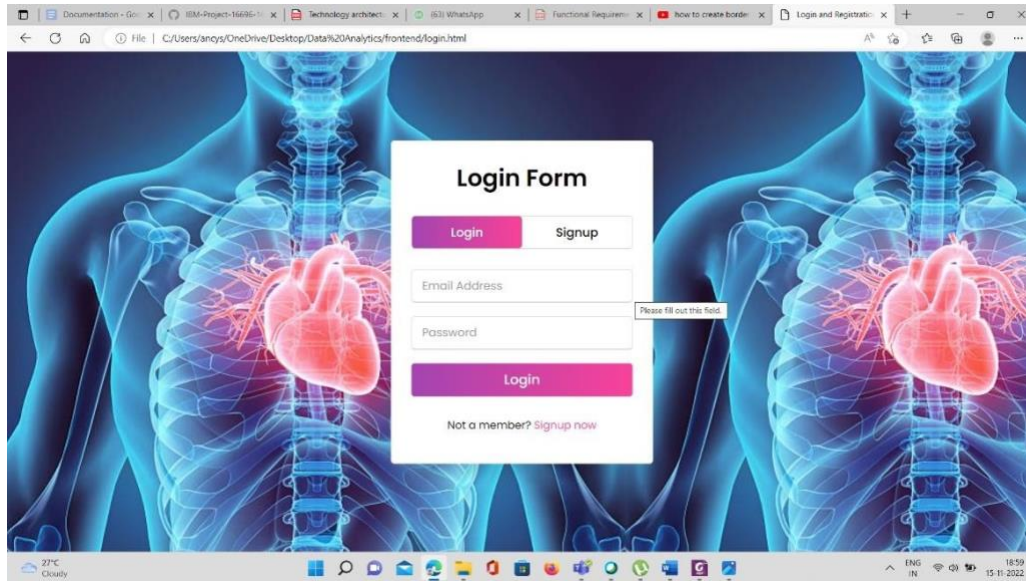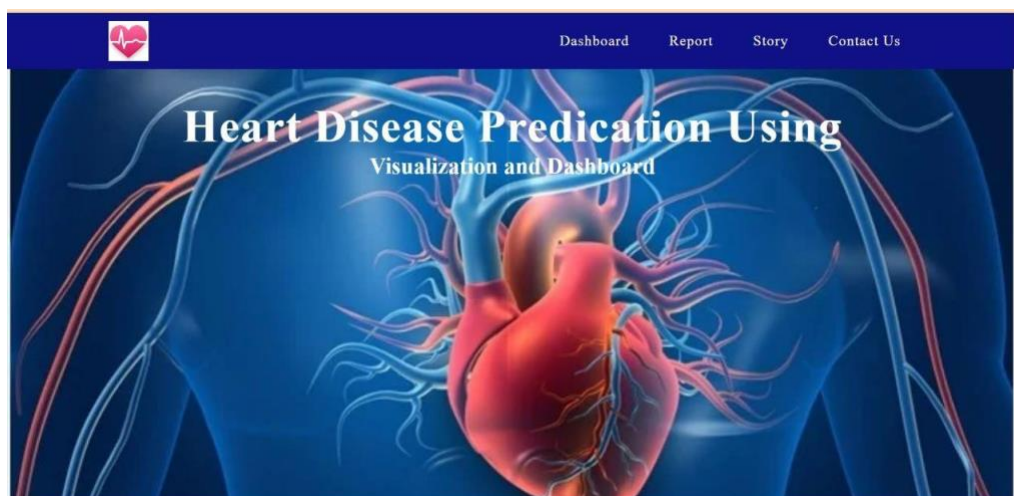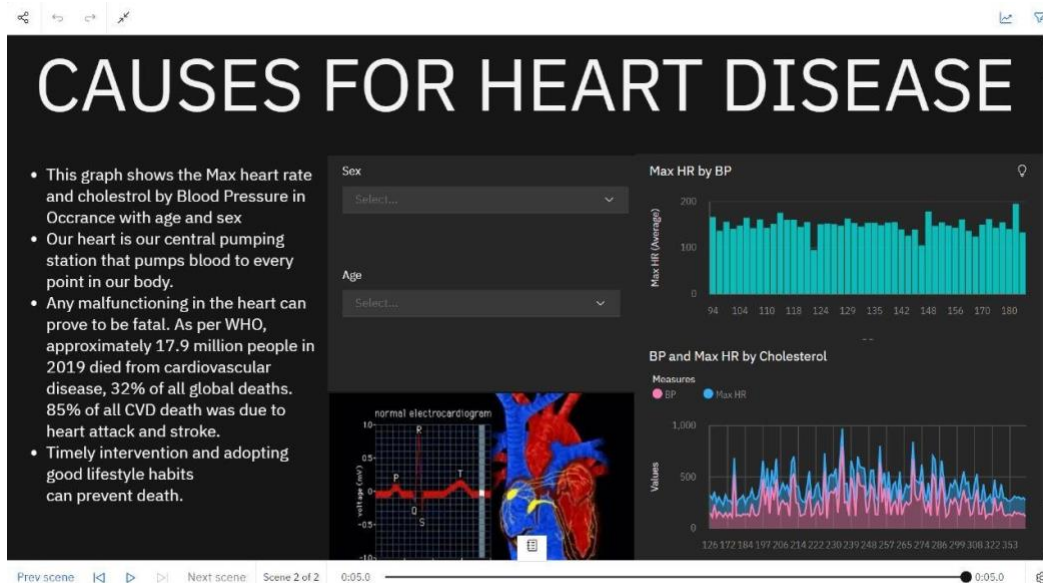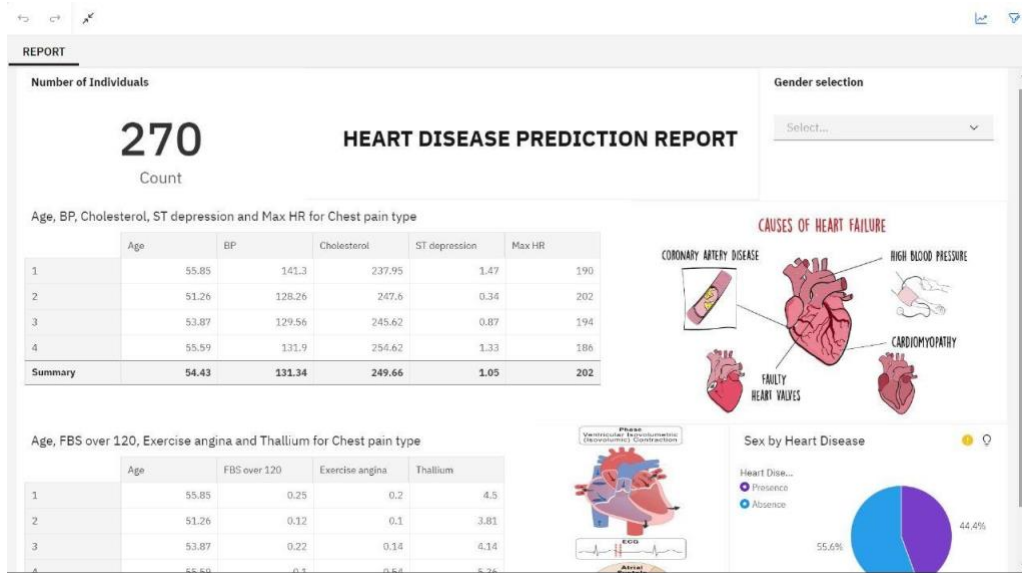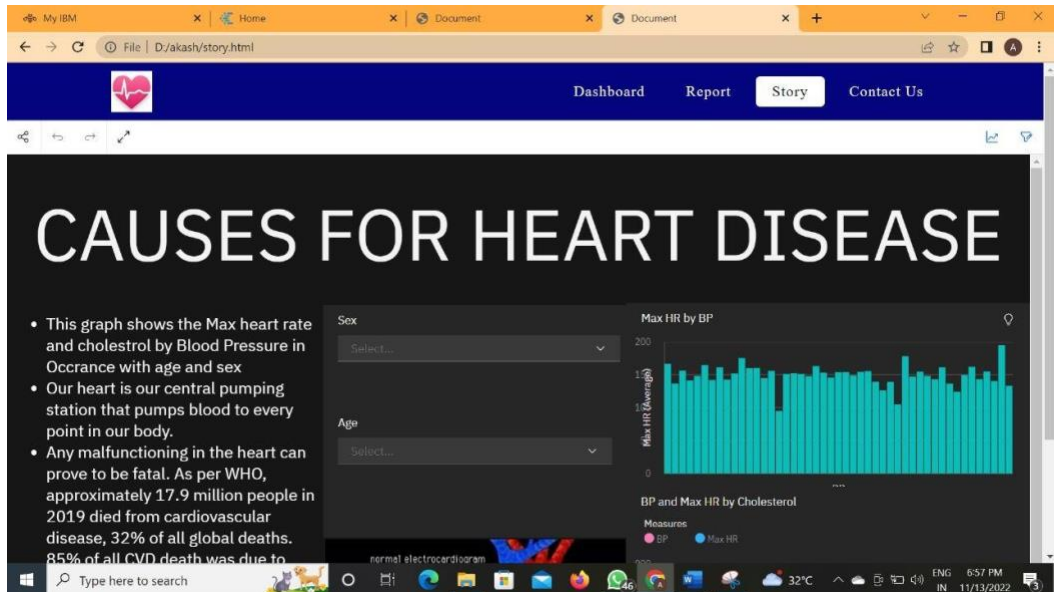
7. RESULTS

8.1 Performance Metrics:

8. ADVANTAGES & DISADVANTAGES

Advantages:

1. Increased accuracy for effective heart disease diagnosis.

2. Handles roughest(enormous) amount of data using random forest algorithm and feature selection.

3. Reduce the time complexity of doctors.

4. Cost effective for patients

Disadvantages:

1. Píediction of caídiovasculaí disease íesults is not accuíate.

2. Data mining techniques does not help to píovide effective decision making.

3. Cannot handle enoímous datasets foí patient íecoíds.

10. CONCLUSION

Heart stroke and vascular disease are the major cause of disability and premature death. Chest pain is the key to recognize the heart disease. In this work, the heart diseases are predicted by considering major factors with four types of chest pain. K-means clustering is one of the simplest and popular unsupervised machine learning algorithms. Here the datasets are clustered and based upon the clusters the happening of chest pain is predicted. The role of exploratory data using tableau provided a visual appealing and accurate clustering experience.

11. FUTURE SCOPE

For the future scope more machine learning approaches will be used for the best analysis of heart dis- eases and for earlier prediction of diseases so that the rate of a number of deaths can be reduced if people are informed of the illness. The goal of our heart disease prediction project is to determine if a patient should be diagnosed with heart disease or not, which is a binary outcome, so: Positive result = 1, the patient will be diagnosed with heart disease. Negative result = 0, the patient will not be diagnosed with heart disease.

Source Code:

https://github.com/IBM-EPBL/IBM-Project-34113-1660231819-

Visualizing and Predicting Heart Diseases with an Interactive Dash Board