Visualizing and Predicting Heart Diseases with an Interactive Dash Board

Team ID: PNT2022TMID27507

Team Members :

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Introduction:

1.1 Project Overview :

Since heart diseases can be predicted based on various symptoms such as age, gender, pulse rate,etc. Data analysis in healthcare assists in predicting diseases, improving diagnosis, analyzing symptoms, providing appropriate medicines, improving the quality of care, minimizing cost, extending the lifespan and reduces the death rate of heart patients.This project is used to predict and visualize the heart diseases of the patient using the interactive dashboard. The data collected from the patients are used to analyze the patients health conditions. Based on the data collected, we will analyze the patients health conditions and come out with a report.

1.2 Purpose:

The purpose of this project is used to find the patients report on a period manner and it will avoid any mistake happen in the patient report. Using this dashboard, we will be able to analyze the patients health condition in a period manner and it will help to know about the patients details in a periodic manner.

2. Literature Survey:

2.1 Existing Problem :

Healthcare industries generate enormous amount of data, so called big data that accommodates hidden knowledge or pattern for decision making. The huge volume of data is used to make decision which is more accurate than intuition. Exploratory Data Analysis (EDA) detects mistakes, finds appropriate data, checks assumptions and determines the correlation among the explanatory variables. In the context, EDA is considered as analyzing data that excludes inferences and statistical modeling. Analytics is an essential technique for any profession as it forecast the future and hidden pattern. Data analytics is considered as a cost

effective technology in the recent past and it plays an essential role in healthcare which includes new research findings, emergency situations and outbreaks of disease. The use of analytics in healthcare improves care by facilitating preventive care and EDA is a vital step while analyzing data.

2.2 References :

Heart Disease Prediction using Exploratory Data Analysis R. Indrakumari, T.Poongodi, Soumya Ranjan Jena : In this paper, the risk factors that causes heart disease is considered and predicted using K-means algorithm and the analysis is carried out using a publicly available data for heart disease. The dataset holds 209 records with 8 attributes such as age, chest pain type, blood pressure, blood glucose level, ECG in rest, heart rate and four types of chest pain. To predict the heart disease, K-means clustering algorithm is used along with data analytics and visualization tool. The paper discusses the pre-processing methods, classifier performances and evaluation metrics. In the result section, the visualized data shows that the prediction is accurate.

Prediction of heart disease at early stage using data mining and big data analytics: A survey N. K. Salma Banu, Suma Swamy : Several studies have been carried out for developing prediction model using individual technique and also by combining two or more techniques. This paper provides a quick and easy review and understanding of available prediction models using data mining from 2004 to 2016. The comparison shows the accuracy level of each model given by different researchers. A few investigations have been completed for creating expectation model utilizing individual procedure and furthermore by joining at least two strategies. This paper gives a speedy and simple survey and comprehension of accessible forecast models utilizing information mining from 2004 to 2016. The correlation shows the precision level of each model given by various analysts.

2.3 Problem Statement Definition:

Who does the problem affect?

People with unhealthy lifestyles, stress, depression, age above 40 and when their ancestors got heart disease (since heart disease is hereditary).

When does the issue occur?

The issue occurs for people with unhealthy lifestyles and age above 40.

Where is the issue occurring?

The issue is originating from an unhealthy lifestyle. It mostly occurs in the blood valves of the heart.

What would happen if we didn't solve the problem?

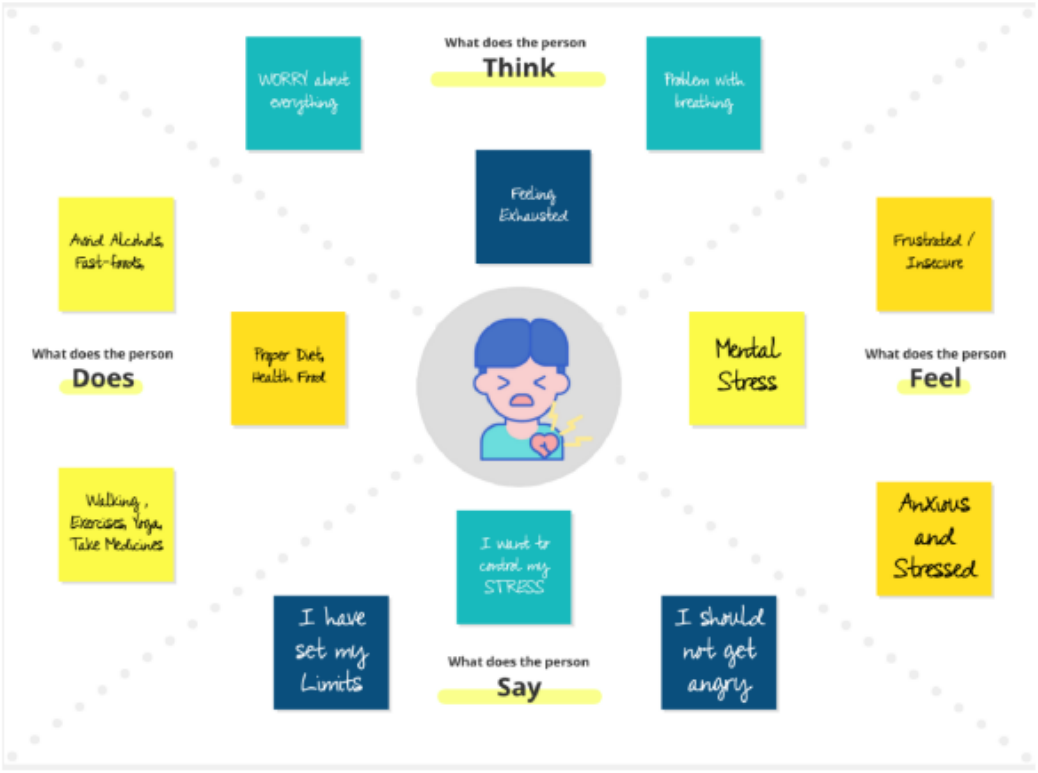
If we don't solve the problem, many people will die at a young age. The death rate due to heart disease will increase rapidly.

Why is it important to fix the problem?

We should predict the problem before giving treatment to the patients. As the problem is predicted early, we can solve it easily and early.

3. Ideation and Proposed Solution:

3.1 Empathy Map Canvas:



3.2 Ideation and Brainstorming

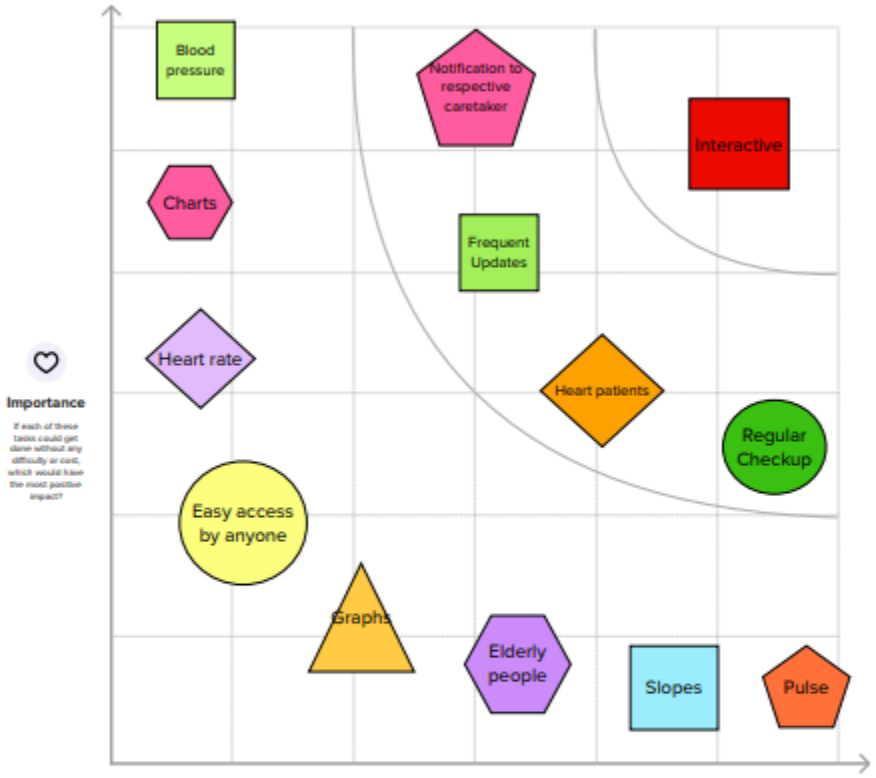
Step-1: Team Gathering, Collaboration and Select the Problem Statement

4

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.

20 minutes



Importance

If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

Feasibility

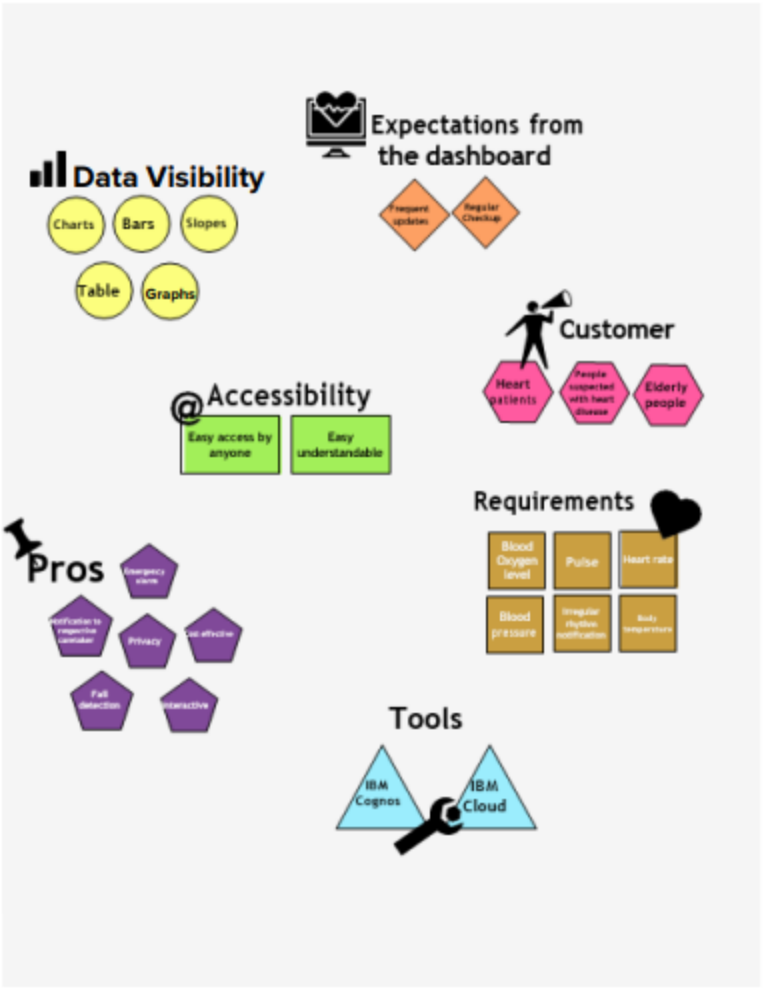
Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, 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.

20 minutes



After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

Share the mural
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

Export the mural
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

Strategy blueprint
Define the components of a new idea or strategy.

Open the template →

Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.

Open the template →

Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.

Open the template →

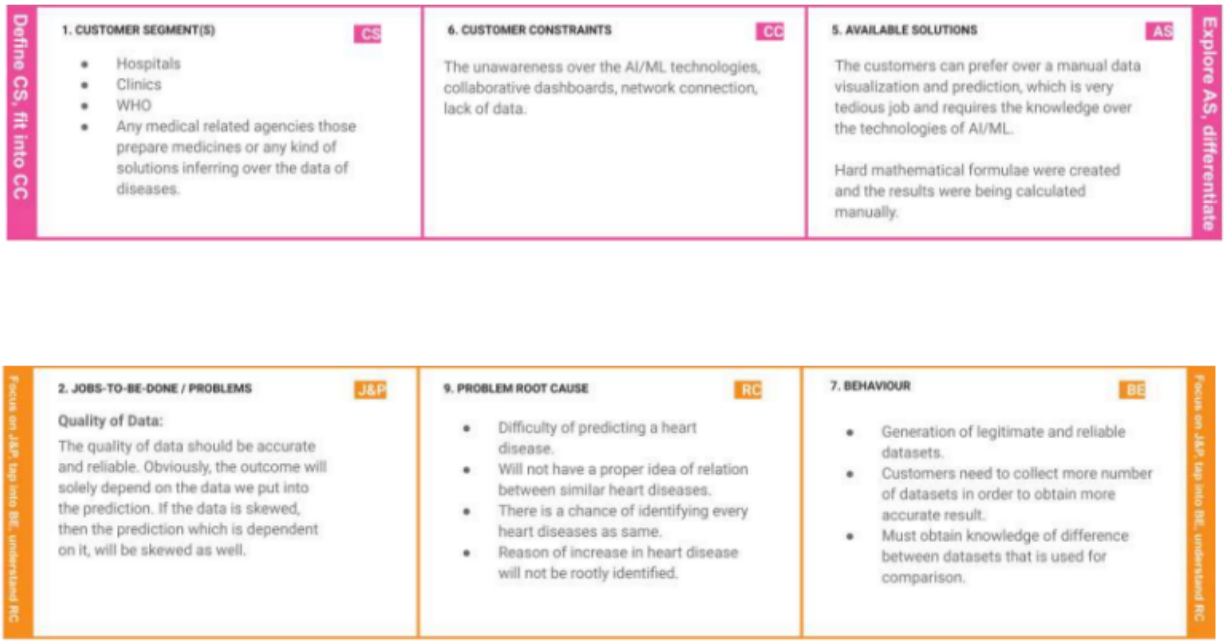
Share template feedback

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	➢ Analyzing data and identifying the heart disease using Cognos analysis.
3	Novelty / Uniqueness	➢ Hoping to achieve maximum accuracy to provide prior treatment to the patients and reduce the fatality rate.
4	Social Impact / Customer Satisfaction	➢ Saving lives, User friendly interactive dashboard. ➢ Reduces the exorbitant medical cost of 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. ➢ Scalable dataset.

3.4 Problem Solution Fit



4.1 Functional & Non-functional requirement :

Following are the functional requirements of the proposed solution.

- It includes registration confirmation condulting,result prediction through various forms through gmail linkedin,OTP.

Following are the non functional requirements of the proposed solution.

- It includes analysing various paramters such as usabilit y, security , reliability, performance, availability, scalability of the project .

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	03 October 2022
Team ID	PNT2022TMIDxxxxxx
Project Name	Project - xxx
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the 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 CONSULTATION	Consultation via online
FR-4	USER RESULT	Result via online
FR-5	USER MEDICATION	Medication via online
FR-6	USER FOLLOW UP	Follow via online

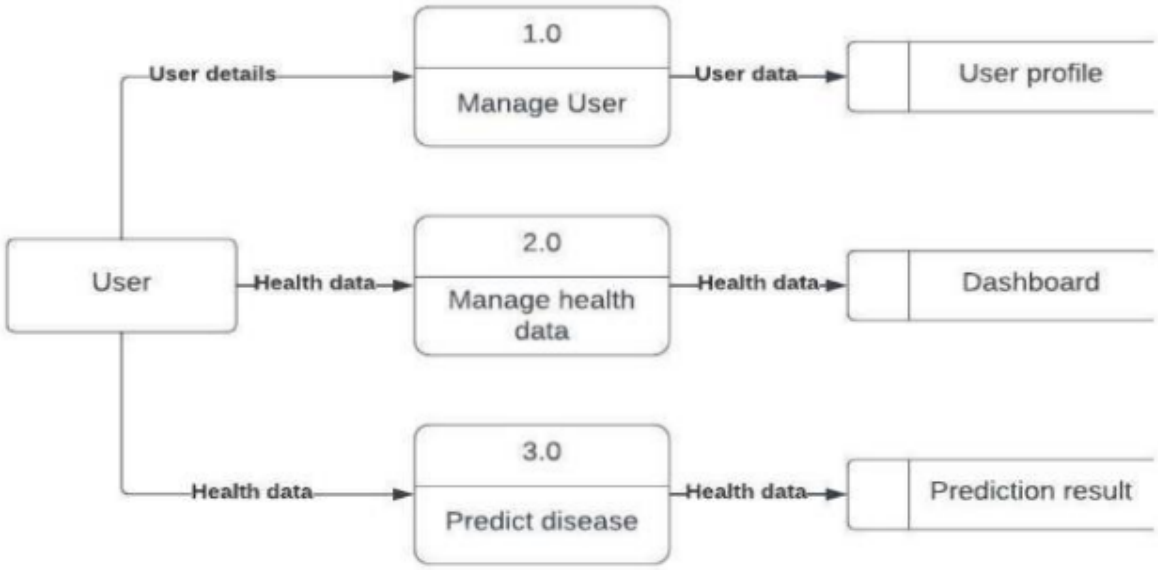
Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

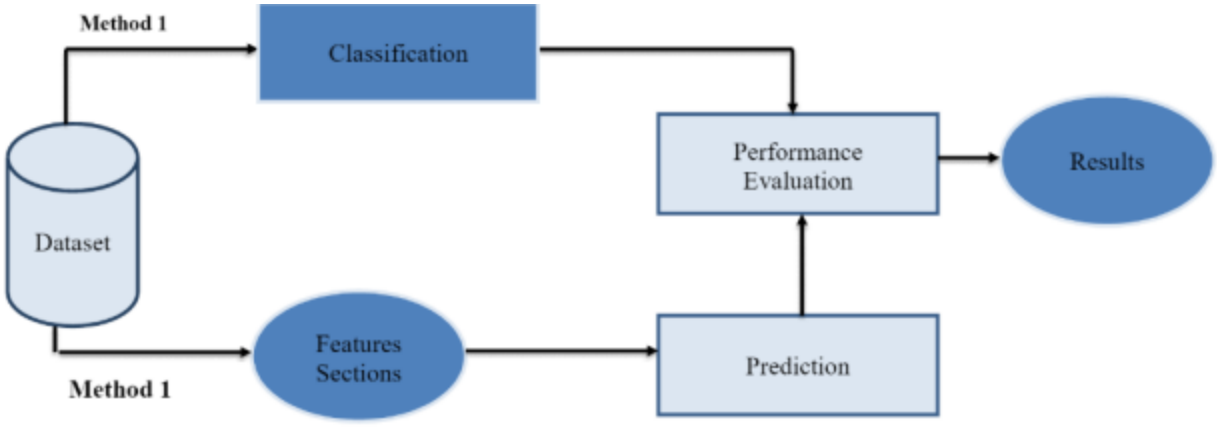
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The usability of the non requirement is feasible
NFR-2	**Security**	File is highly secured and cannot be misused
NFR-3	**Reliability**	It is highly reliable
NFR-4	**Performance**	It is accurate...and gives exact value
NFR-5	**Availability**	It is anytime accesible
NFR-6	**Scalability**	Through the given features this app;ication can be taken into interational business level

5. Project Design

5.1 Data Flow Diagram

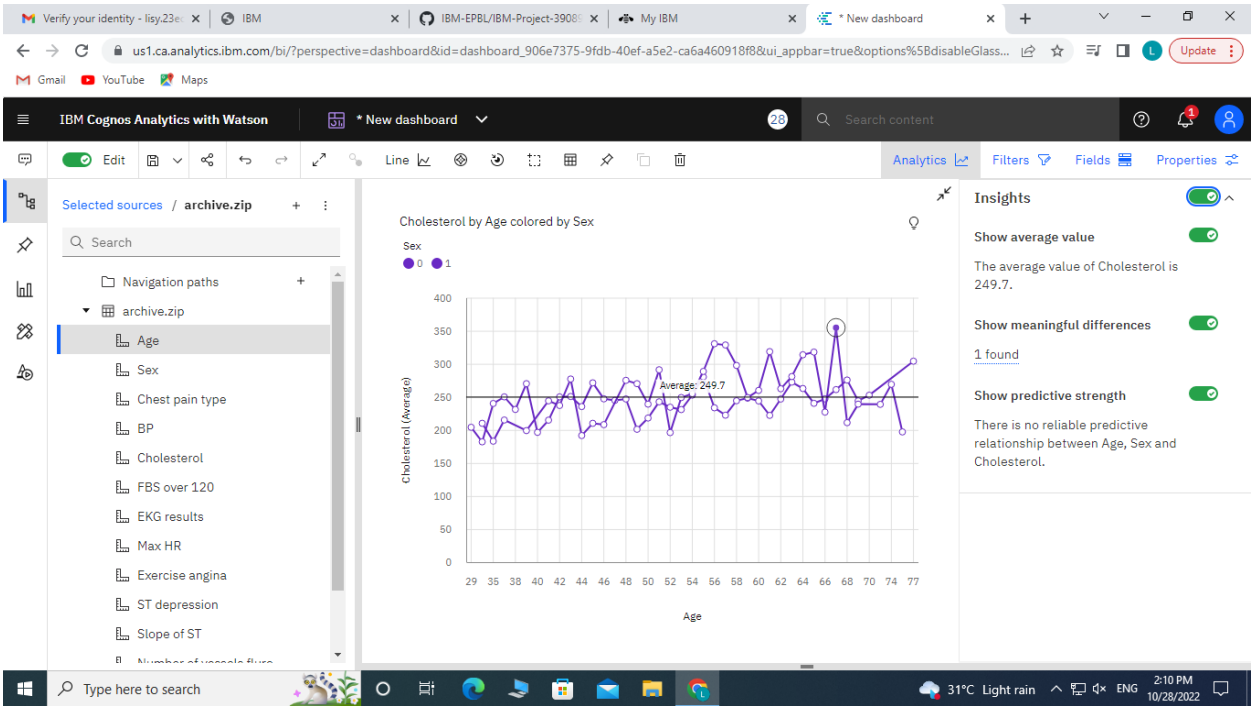


5.2 Solution and Technical Architecture

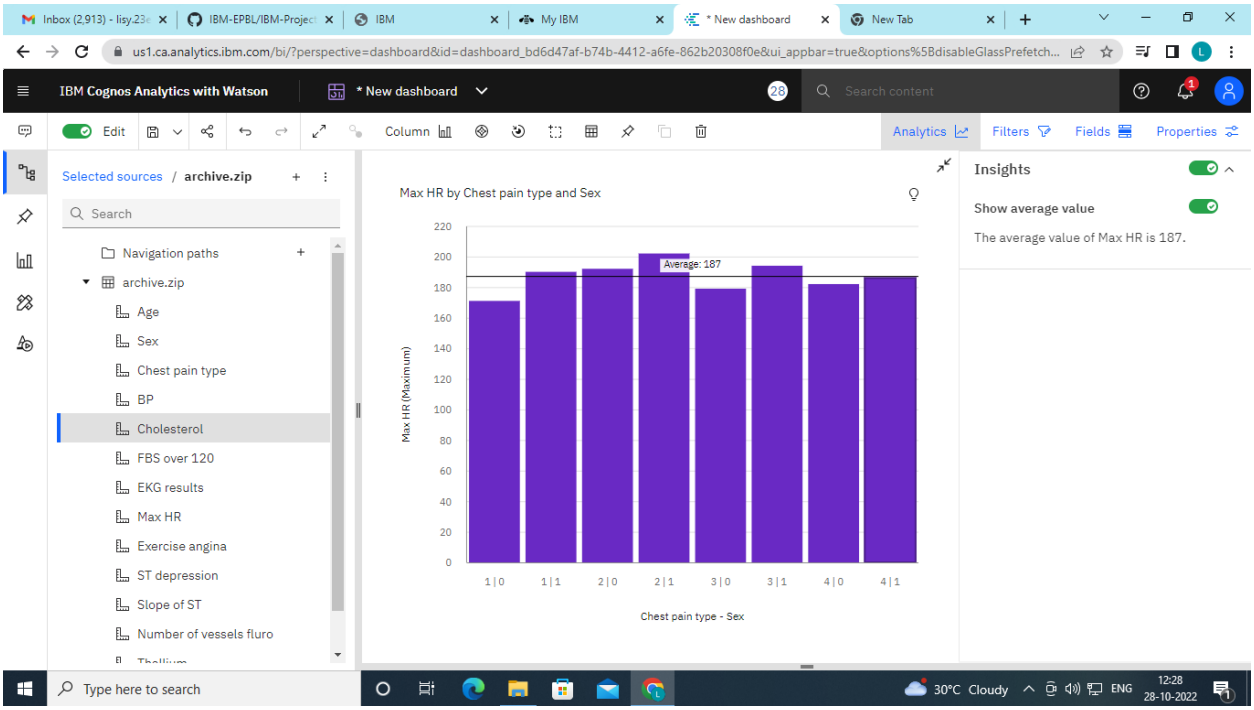


6. Dashboard :

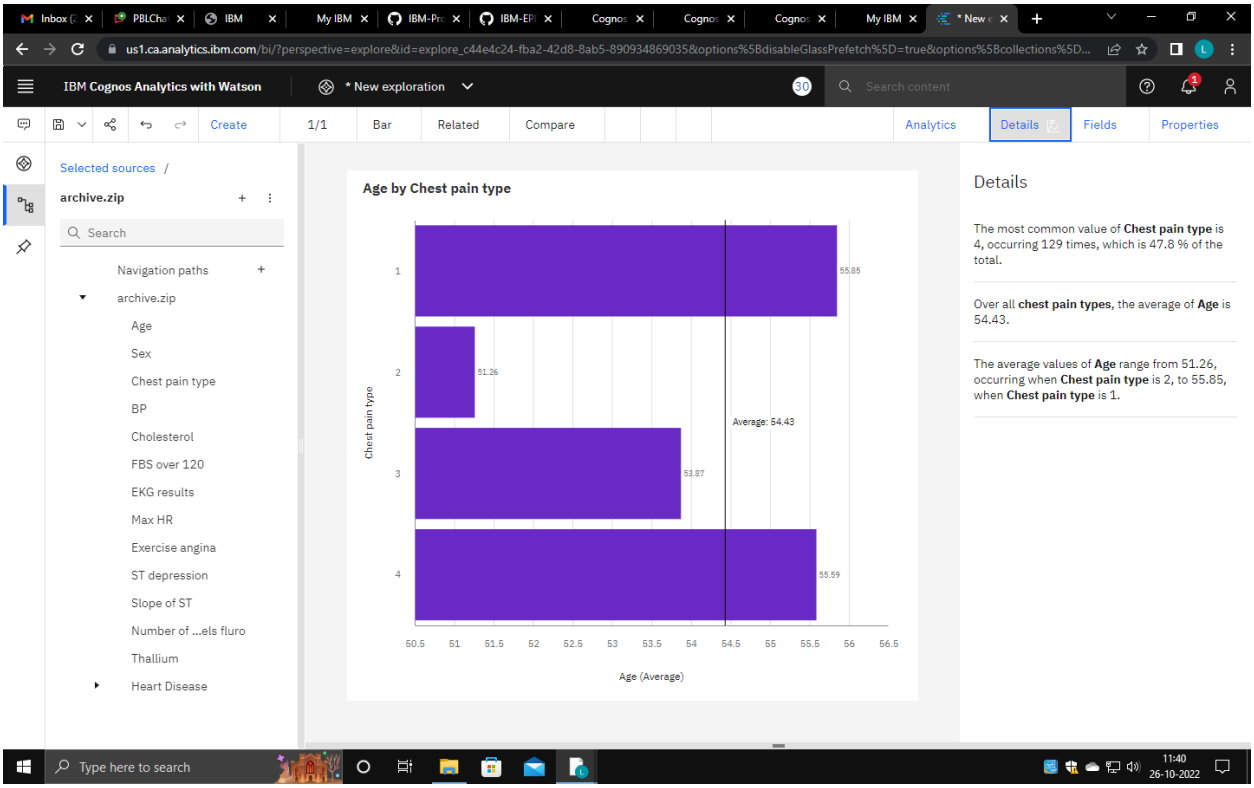
Exploration Of Cholesterol by age and Gender:



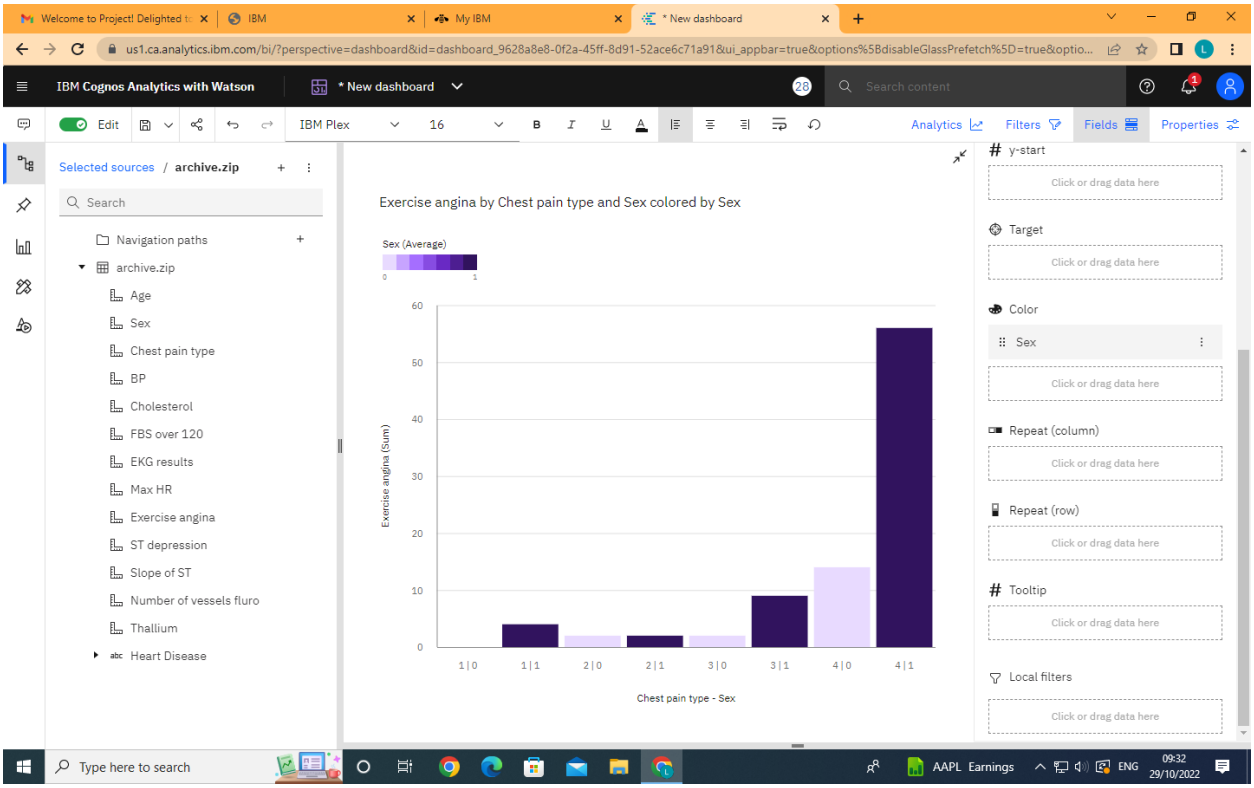
Max HR by chest pain type and sex:



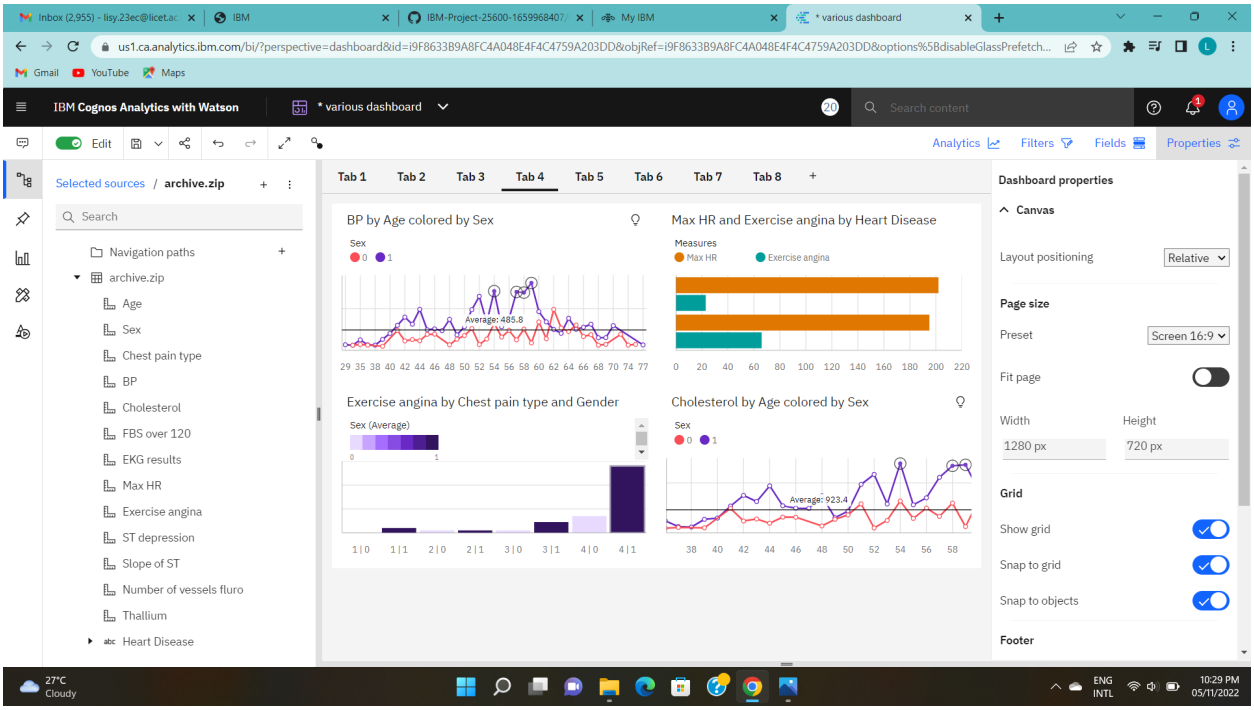
Age by chest pain type:



Excercise Angina by Chest pain type and sex colored by sex



Dashboard Showing Different Types Of Visuals:



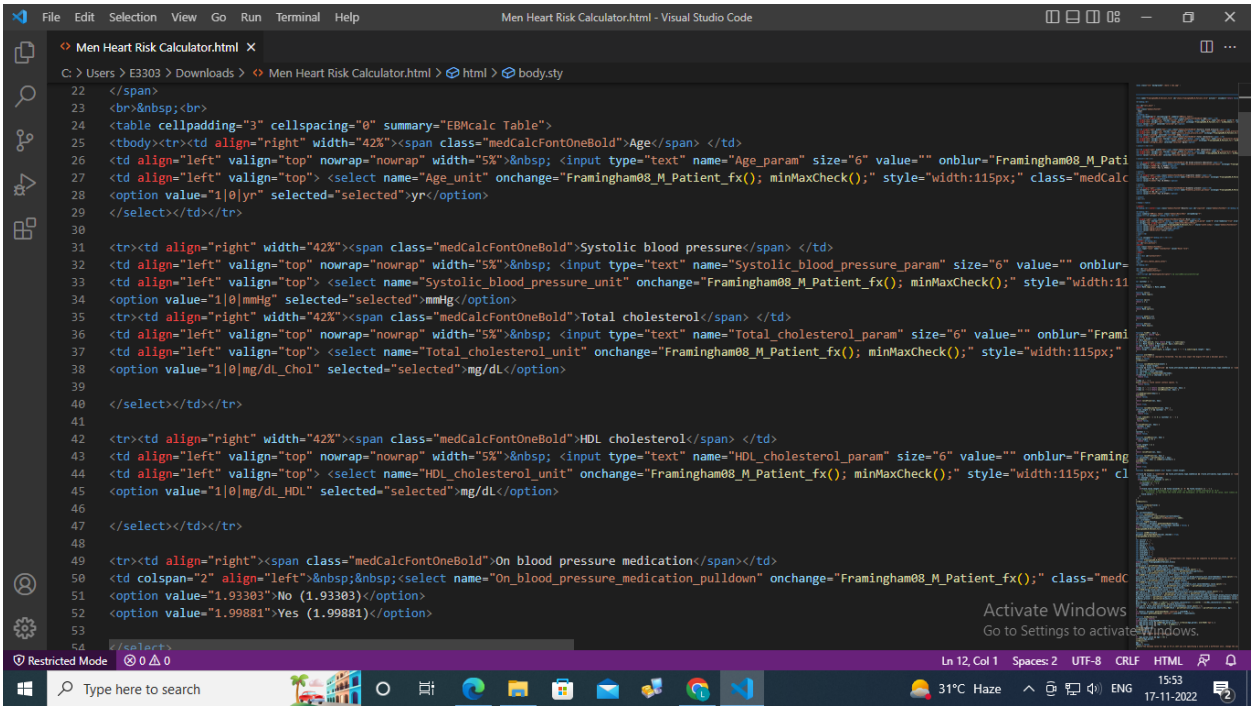
6. Project Planning and Scheduling

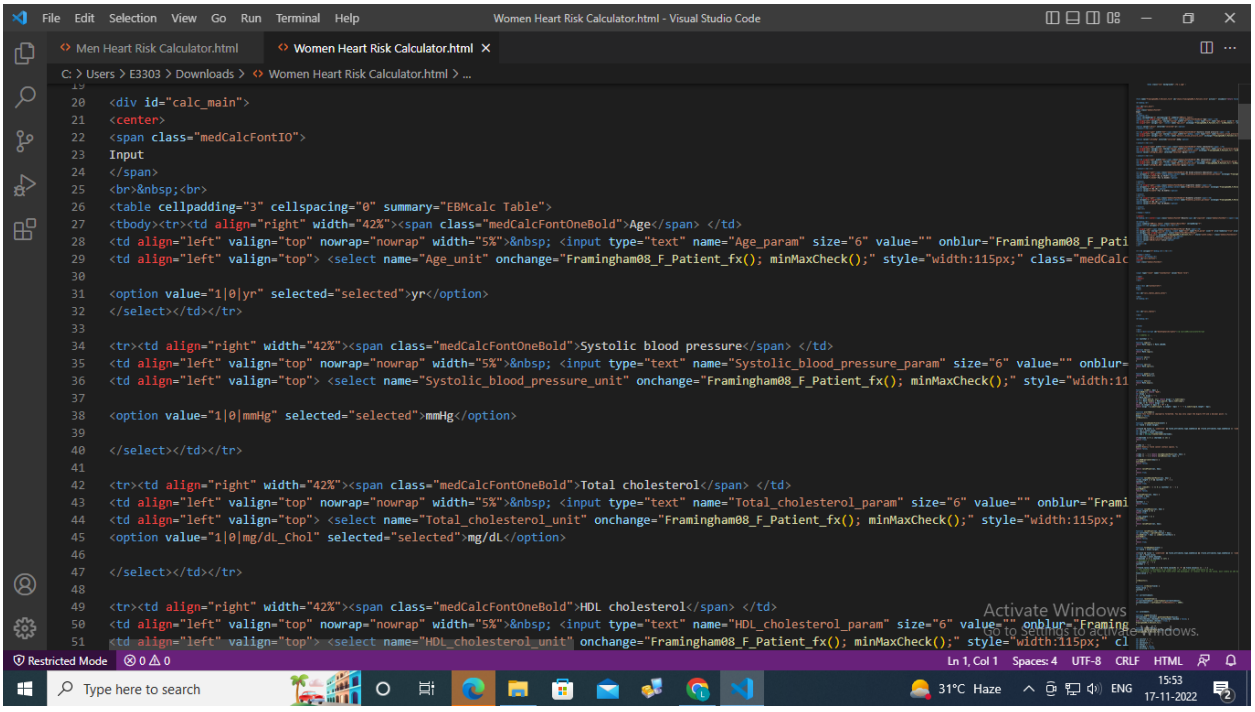
6.1 Script Planning and Execution

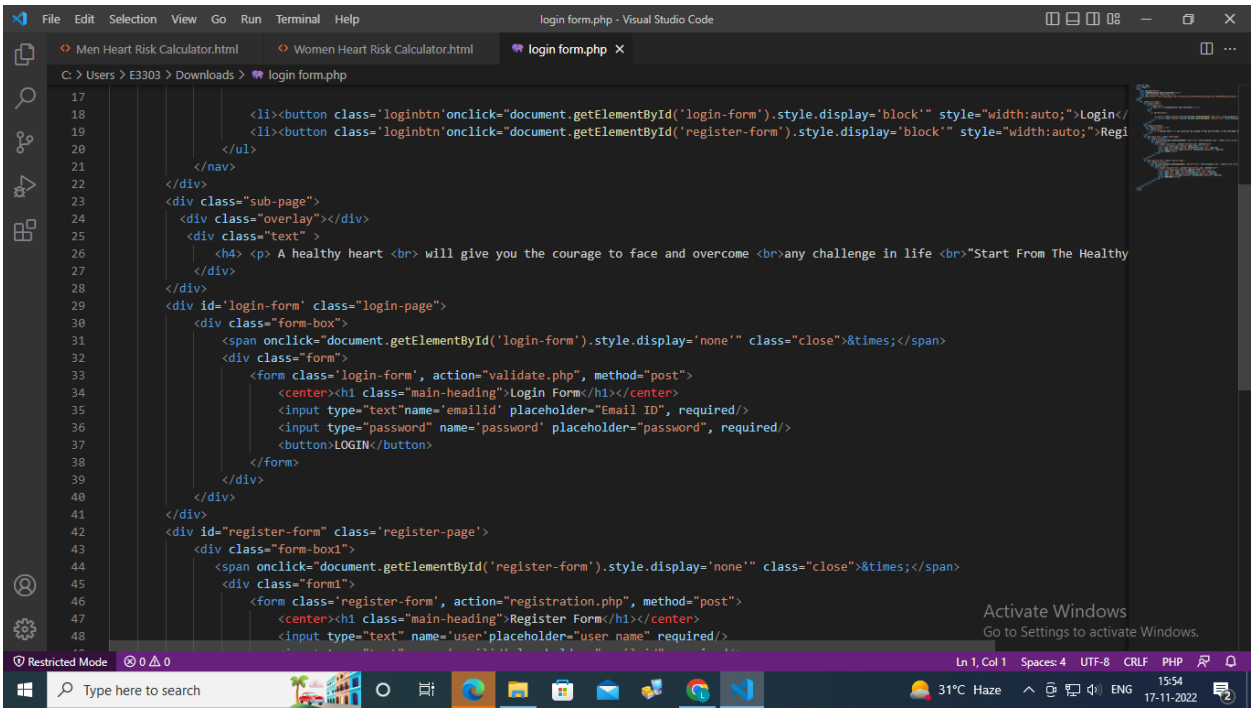
Sprint	Functional Requirement (Epic)	User number story	User Story / Task	Story Points	Priority
Sprint-1	Registration	1	As a user, I can register for the application by entering my email, password, and confirming my password	3	high
Sprint-1	**Confirmation**	2	As a user, I will receive confirmation email once I have registered for the application	3	high
Sprint-1	Registration	3	As a user, I can register for the application through Gmail	6	medium

Sprint-1	Login	4	As a user, I can log into the application by entering email & password	6	high
Sprint-2	Dashboard	5	Attractive dashboard For the Application	3	medium
Sprint-2	**Profile**	6	Profile - view & update your profile	5	low
Sprint-2	**Analyse**	7	Home - Analyze your Heart problem	2	high
Sprint-3	Support	8	Get feedback from users	10	medium
Sprint-3	**Respond**	9	Responds to user queries via telephone,email etc.	3	medium
Sprint-3	**Respond**	10	The team must respond immediately to the queries based on the priority	5	high
Sprint-4	System Requirements	11	Hardware Requirement Laptop or PC ● i5 processor system or higher ● 4 GB RAM or higher ● 128 GB ROM or higher Mobile ● (12.0 and above)	5	medium

7. Coding And Solutioning :






File Edit Selection View Go Run Terminal Help
login form.php - Visual Studio Code
Men Heart Risk Calculator.html
Women Heart Risk Calculator.html
login form.php
C: > Users > E3303 > Downloads > login form.php
<button class='loginbtn'onclick="document.getElementById('login-form').style.display='block'" style="width:auto;">Login</
<button class='loginbtn'onclick="document.getElementById('register-form').style.display='block'" style="width:auto;">Regi

</nav>

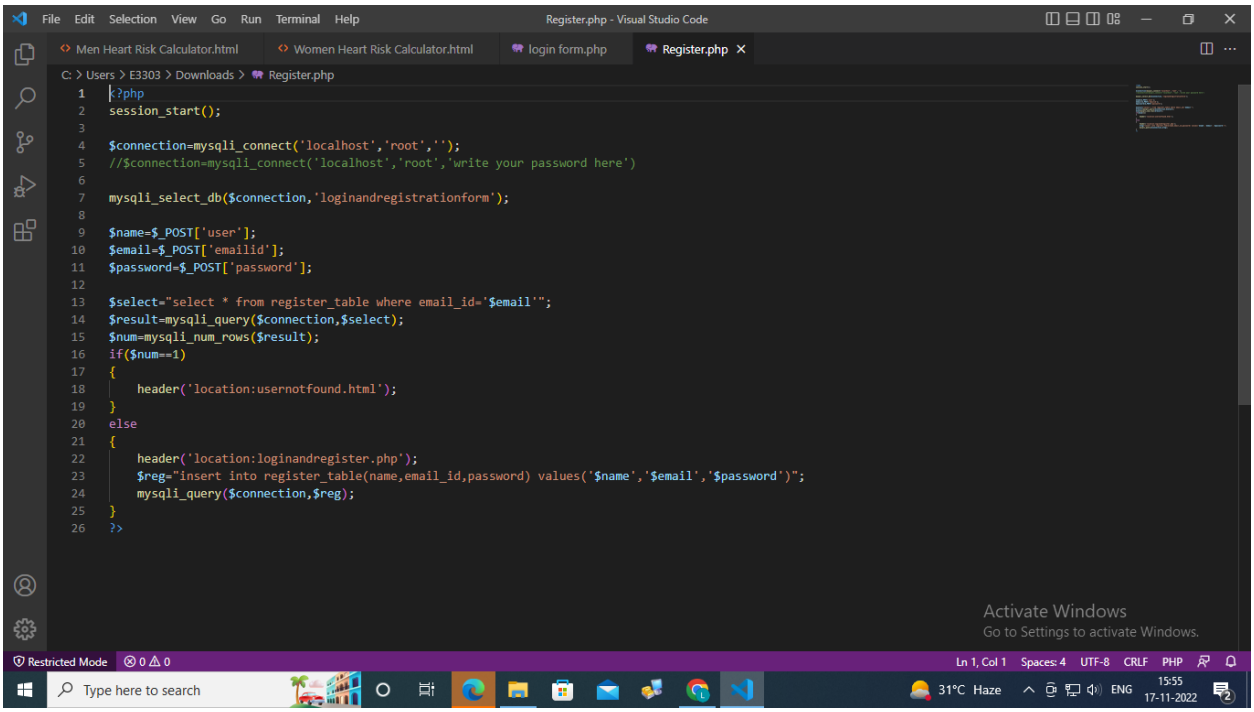
<h4> <p> A healthy heart
 will give you the courage to face and overcome
any challenge in life
"Start From The Healthy

×

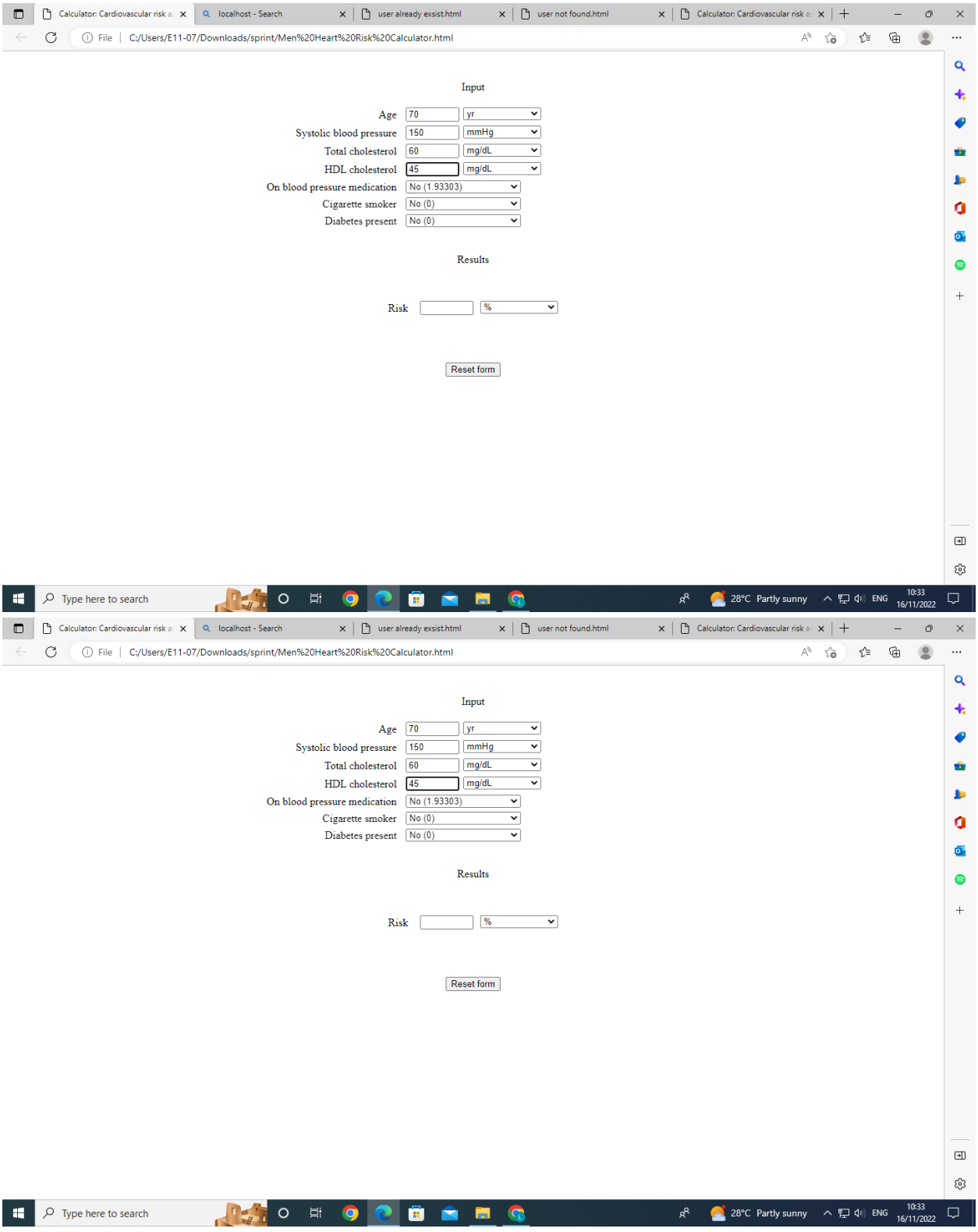
<form class='login-form', action="validate.php", method="post">
<h1 class="main-heading">Login Form</h1>
<input type="text"name='emailid' placeholder="Email ID", required/>
<input type="password" name='password' placeholder="password", required/>
<button>LOGIN</button>
</form>

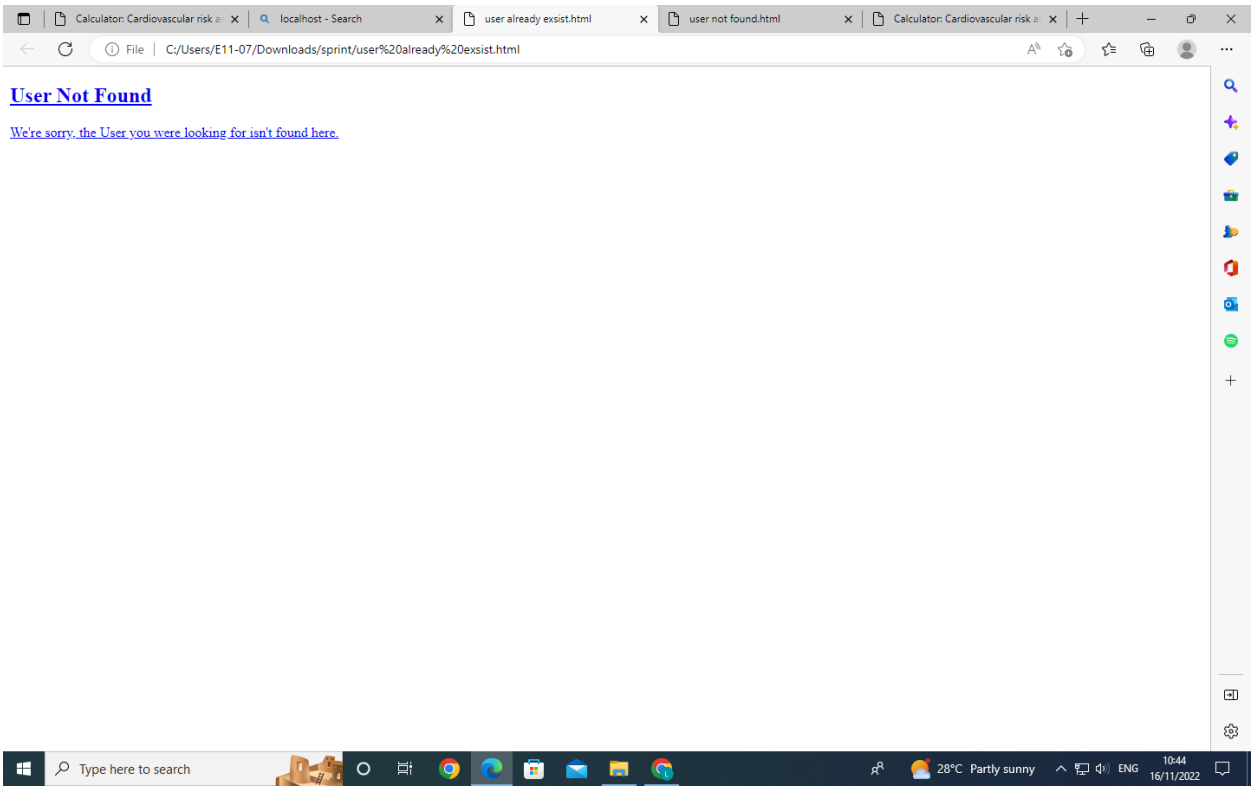
×

<form class='register-form', action="registration.php", method="post">
<h1 class="main-heading">Register Form</h1>
<input type="text" name='user'placeholder="user name" required/>
Activate Windows
Go to Settings to activate Windows.
Restricted Mode
Ln 1, Col 1
Spaces: 4
UTF-8
CRLF
PHP
Type here to search
31°C Haze
ENG
15:54
17-11-2022


File Edit Selection View Go Run Terminal Help
Register.php - Visual Studio Code
Men Heart Risk Calculator.html
Women Heart Risk Calculator.html
login form.php
Register.php
C: > Users > E3303 > Downloads > Register.php
<?php
session_start();
$connection=mysqli_connect('localhost','root','');
//$connection=mysqli_connect('localhost','root','write your password here')
mysqli_select_db($connection,'loginandregistrationform');
$name=$_POST['user'];
$email=$_POST['emailid'];
$password=$_POST['password'];
$select="select * from register_table where email_id='$email'";
$result=mysqli_query($connection,$select);
$num=mysqli_num_rows($result);
if($num==1)
{
header('location:usernotfound.html');
}
else
{
header('location:loginandregister.php');
$reg="insert into register_table(name,email_id,password) values('$name','$email','$password')";
mysqli_query($connection,$reg);
}
?>
Activate Windows
Go to Settings to activate Windows.
Restricted Mode
Ln 1, Col 1
Spaces: 4
UTF-8
CRLF
PHP
Type here to search
31°C Haze
ENG
15:55
17-11-2022

8.Result :


Calculator: Cardiovascular risk a
localhost - Search
user already exsist.html
user not found.html
Calculator: Cardiovascular risk a
File | C:/Users/E11-07/Downloads/sprint/Men%20Heart%20Risk%20Calculator.html
Input
Age 70 yr
Systolic blood pressure 150 mmHg
Total cholesterol 60 mg/dL
HDL cholesterol 45 mg/dL
On blood pressure medication No (1.93303)
Cigarette smoker No (0)
Diabetes present No (0)
Results
Risk %
Reset form
Type here to search
28°C Partly sunny
ENG
10:33
16/11/2022



9. Advantages & Disadvantages:

Advantages:

- This is one of the fastest ways to determine if a person is likely to suffer from a heart disease or not.
- Useful for medical practitioners to easily classify their patients.
- User Friendly
- Easy to understand
- Secure
- Dashboard provides insightful informations

Disadvantages:

- Needs work
- Users need to know all the fields
- Does Not take null value as input
- Does not provide suggestions to user

10. Conclusion

Complications of heart disease include heart attack and stroke. You can reduce the risk of complications with early diagnosis and treatment. So the suggestion that we get from the website might help save patients. It is always to get treated in the early stages of heart disease.

11. Future Scope

Like the saying goes “Prevention is better than cure”. We have to look into methods to prevent heart diseases altogether other than just predicting it in early stages. To use this website we need to take a lot of tests beforehand. So it would be better if we require less attributes and still give an effective result.

12. Appendix :

Source Code :

https://github.com/IBM-EPBL/IBM-Project-39089-1660394016/tree/main