V Care Online Disease Prediction system

FINAL REVIEW REPORT

Submitted by

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Prepared For

SOFTWARE DESIGN AND DEVELOPMENT (CSE1005)

PROJECT COMPONENT

Submitted To

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VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

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1. INTRODUCTION

The recent days have been hard for everyone due to the COVID-19 pandemic and a lot of people are scared to even step out of their homes due to this. Hence, people are less likely to visit a doctor these days since they have to go out of their homes and visit the doctor. The doctor then might suggest another specialist depending on the severity and the type of the disease.

Hence, a more accessible method is required for people to get checked if they have a specific disease. In India, especially, there has been a surge of internet usage in recent times and a lot more people now have access to smartphones and other devices through which they can access the internet easily.

Therefore, we will be creating a system that helps the people know what kind of disease they might have instead of directly using search engines which could generally give out wrong data due to inappropriate searches of symptoms by people.

This application will assess the information given by the user by asking specific questions and their severity and then predict what disease they might have.

2. PROJECT SCOPE

Most of the people tend to search on search engines like Google to find out what disease they might have. This could be effective, but sometimes, the search engine might show a different conclusion since the severity of some symptoms is not mentioned by the user. Therefore, this outcome could be inaccurate, it could show something very severe or minor, both of which could be harmful for the user and might cause him/her to panic.

This application would help a lot more people self-diagnose so that they can take appropriate steps to counter the situations. For example, once the application gives an output mentioning a disease, the user might directly contact a specialist if needed instead of going to a general physician.

In later versions, we could also use this data to make this system better and also help the people get directions to the nearest doctor/specialist.

3. KEY CONTACTS AND STAKEHOLDERS

Name	Registration Number	Phone Number
V Shruthiy	18BCB0139	+91 93541 69081
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4. PROJECT RESOURCE REQUIREMENTS

a. Software Resource Requirements

1. Windows XP/Vista/7/8/10, Mac OS or Linux
2. Mysql
3. HTML 5
4. JavaScript
5. PHP5.5
6. Apache Web Server

5. SRS CONTENTS

5.1 INTRODUCTION (SAHITYA MADIPALLI-19BCI0232)

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In later versions, we could also use this data to make this system better and also help the people get directions to the nearest doctor/specialist.

5.4 DEFINITIONS, ACRONYMS AND ABBREVIATIONS (ABHISHEK MISHRA -18BCB0027)

System definition:

A soft computing method based web project which helps in predicting the disease based on thesymptoms of the patient. Also inform the patients about nearby doctors’ availability and precautions to be taken. The heart of the project is Fuzzy Logic , a soft computing technique which makes use of knowledge base made by the experts(doctors in this case) to predict the disease severity.

In our project, there will be two types of login. One will be for Doctors and one will be for patients. First doctor will make entry of types of diseases and symptoms related to it. He will alsoenter the range value of each symptom. The symptom will affect that disease if it is in the range entered by doctor. Then he will save it into disease knowledge base. Then he will logout.

After this the patient will login. He will reach to a webpage in which he will be asked to enter thevalue of symptoms. There will be three columns. First will be symptom name, second will be thevalue, which the patient has to fill. The value will be guess by the patient. It will tell that what thepatient thinks about how severely that particular symptom is affecting him. For eg: - Take one ofthe symptom as cold .Than if patient enter the value 0-3 value ,it means little sign of that symptom, 4-7 means he is average effected, and 8-10 means he is severely affected. The thirdcolumn will be the description of each symptom.

After filling the value related to each symptom, patient will click on evaluate symptom forevaluation and it will display with what disease he is probably effected.
After this the doctor can login and can also do accuracy testing for each type of disease he entered. Accuracy testing will display the confusion matrix corresponding to the disease.

Keyword definition:

Fuzzy logic (Mathematical tool): It is a form of many-value logic in which the true values of variables may be any real number between 0 and 1 both inclusive. It is employed to handle the concept of partial truth, where the true value may range between completely true and completelyfalse. It works on the principle of assigning a particular output depending on the probability of thestate of the input.
In this project, the symptom value which the patient is filling is actually fuzzy values, by thesefuzzy values, a calculation is done and then the particular disease is predicted.

Acronyms and Abbreviations:

Abbreviation	Designation
TTMS	Testing Tool Management System
SRS	Software Requirements Specification
TCM	Test Case Management
SRS	Software Requirements Specification
PM	Project Manager
PID	Project Identification
RID	Requirement Identification
AM	Account Manager
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
PHP	Hypertext Preprocessor
XAMPP	abbreviation for cross-platform, Apache, MySQL, PHPand Perl,

5.5 REFERENCES (ABHISHEK MISHRA -18BCB0027)

1.https://www.researchgate.net/publication/323973550_Online_medical_consultation_a_reviewhttps://ijcsmc.com/docs/papers/May2019/V8I5201938.pdf
2.https://www.atsjournals.org/doi/full/10.1164/rccm.200207-777CP
3.https://www.sciencedirect.com/science/article/pii/S093336570000072
4.https://ieeexplore.ieee.org/abstract/document/7284190
5.https://www.sciencedirect.com/science/article/abs/pii/S03069871830961

5.6 OVERALL DESCRIPTION

5.6.1 PRODUCT PERSPECTIVE (18BCB0027-ABHISHEK MISHRA)

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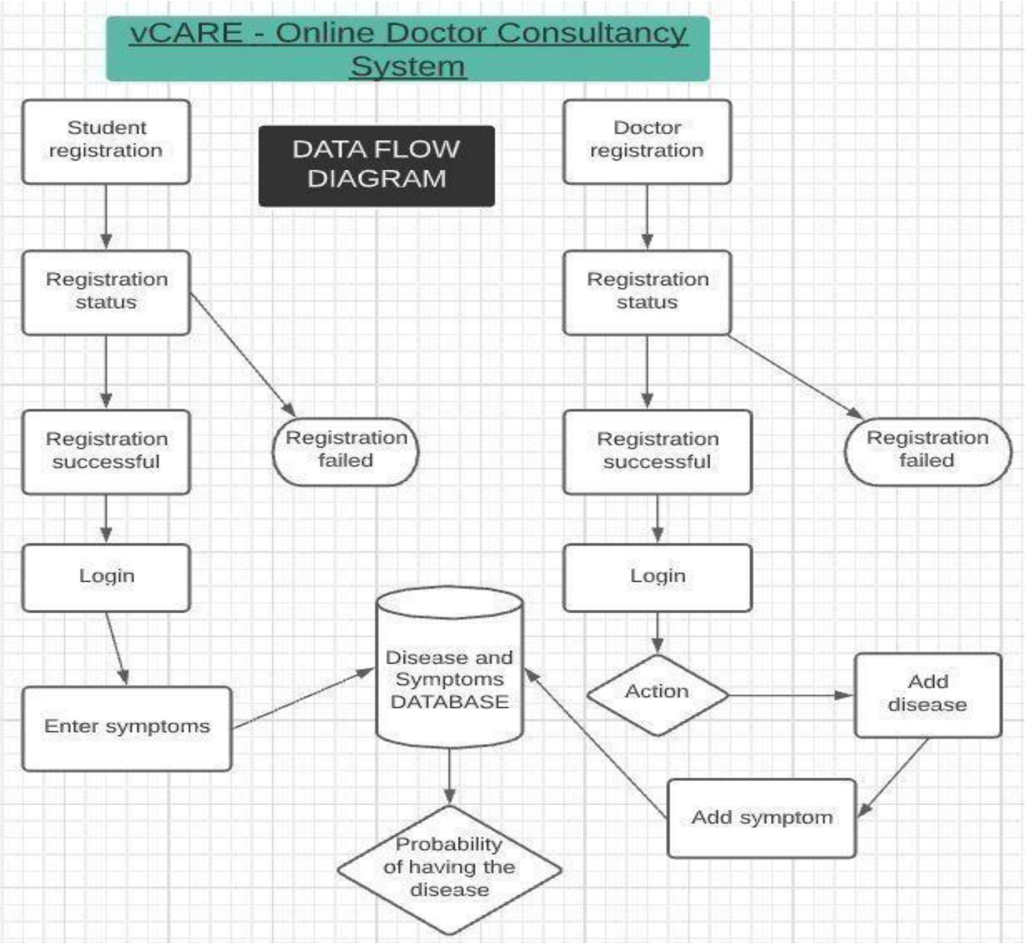


Overview of the proposed system

5.6.2 PRODUCT FUNCTIONS (18BCB0027-ABHISHEK MISHRA)

The following are the user requirements for the system

There are two types of End users for the system. The first page will consist of two options for users to select. Options are

- Doctors Log in
- Patient Log in

If the user is doctor,he can do:
1. Add disease in knowledge base and precaution to be taken
2. Add symptoms
3. Add symptom description and range of each symptom
4. Save the details
5. Accuracy testing of each disease

If the user is patient he can do following tasks
1.Add value for each symptom
2. Evaluate symptoms
3. Check the result come after evaluation

5.6.3 USER CHARACTERISTICS: (MAITREYEE PALIWAL-18BCB0087)

We anticipate there are basically two user categories who can use the website and are identified as our potential users. Both these end users should have just basic knowledgeof computer systems to adapt to the form based user interfaces offered by the system. They should be literate enough to read the text / asked entries to predict the disease probability.

Patient: Patient needs to register and log in to the system. Logged in patient is required to choose a symptom value/range for a list of symptoms. Each symptom also has a description that will help patient user to choose from the symptom level dropdown to best predict the disease. Patient gets to know the severity of diseases with a link to know the related precautions for the same. It also has an option to lookfor nearby doctors specialized in the particular disease domain.

Doctor: Doctor needs to register and then log in to the system. Logged in doctor can add disease in the database. To add a disease to the database, doctor should have knowledge of disease details along with its symptom details (with their ranges)for predicting severity. Doctors can test the accuracy of their entered disease data entries.

5.6.4: CONSTRAINTS (MAITREYEE PALIWAL-18BCB0087)

1. Only English language supported.
2. True doctor identity validation is missing.
3. No separate admin control. It is complete doctor patient portal.
4. Disease symptoms validation is missing.
5. To detect disease severity, patients need to select values from dropdowns for a lot of symptoms, all of which might not be of use for the disease patient wants to search for.
6. Since fuzzy logic is based on pure assumptions, it is not promised to give accurate results always.

7. A single incorrect value/ value range chosen by the patient could lead to extremely different results.

5.6.5: ASSUMPTIONS AND DEPENDENCIES (MAITREYEE PALIWAL-18BCB0087)

1. Only logged in patients can test their disease risk probability.
2. Only logged in doctors can add diseases or test accuracy of the added diseases.
3. The disease added by doctors gets reflected in the disease database.
4. The disease database is linked to the entire website to all the web pages within.
5. For every session of patients, the data values of the symptoms are reset at the start.
6. Fuzzy logic is the core principle used for disease risk probability prediction based on symptoms
7. To predict the probability, it is assumed patient user has filled correct values for each of the symptom.

5.7 EXTERNAL INTERFACE REQUIREMENTS (MAITREYEE PALIWAL-18BCB0087)

5.7.1: USER INTERFACES

- The system will provide GUI for the users.
- Intuitive, simple UI to facilitate easy walkthrough of website.
- Standard buttons widely understood symbols are used to provide ease of use.
- Clear text font of optimal font size will be used.
- Logout button will be at the same place in every page.

5.7.2: HARDWARE INTERFACES

To use this web application, we will need a PC with any OS and minimumdatabase space as

If system doesn't have touch input, a mouse and keyboard will also be requiredby the user to provide input.

5.7.3: SOFTWARE INTERFACES

Frontend : HTML , CSS, JavaScript, JQuery

Backend : PHP

Database : MySQL

Local Server : XAMPP

Additional framework : Bootstrap

5.7.4: COMMUNICATIONS INTERFACE

- We will first test the code on the local host server.
- After complete making of the web application, https protocol could be used forthe website.
- Since the application is designed using phpmyadmin, we know from its documentation that for this application to work well, we would need browser that is supported by JQuery 2.0. Hence, the web application will work on following web browsers:

Chrome: (Current - 1) and Current
Edge: (Current - 1) and Current

Firefox: (Current - 1) and Current, ESR

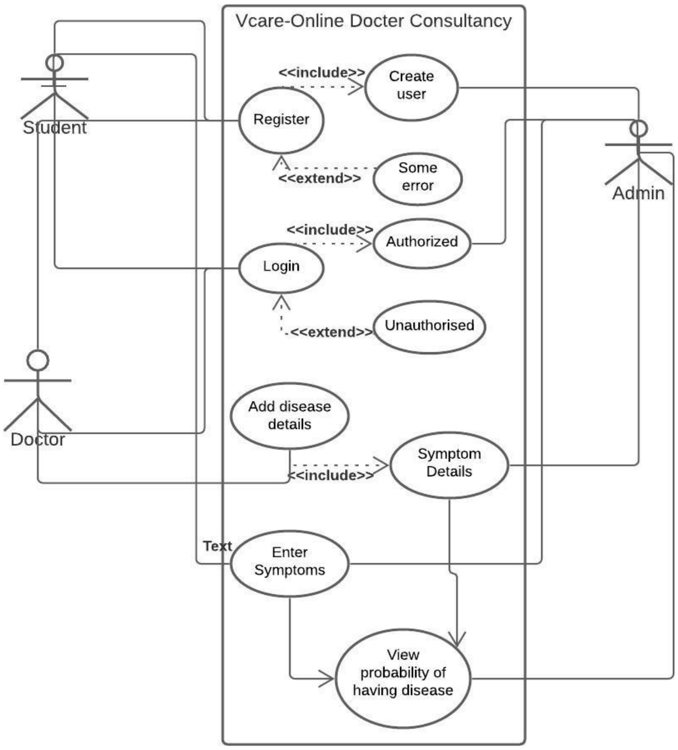
Internet Explorer: 9+

Safari: (Current - 1) and Current

Opera: Current

5.8: FUNCTIONAL REQUIREMENTS (SIDDHARTH CHATTERJEE-19BCE2249)

5.8.1: USE CASE DIAGRAM



5.8.2 USE CASE DESCRIPTION

Admin: He/She is a person that maintains the website and database and has the highest levelof authority to access/edit anything.

User :

2 stakeholders

Primary – ***Student/Patient*** → who signs up on our website or logs in. They have access totheir module of the website, which includes inserting symptoms they have and any other problems and self-diagnosis interface.

Secondary – ***Doctor*** → who inserts diagnosis of the disease according to the symptoms in thedatabase created. Has his/her own login and access module to frontpage of the website

5.8.3 SYSTEM FEATURES

The users of this system can be patients who would like to know what kind of specialized doctor they have to consult.
The users of this system can be doctors who would like to help people via online platforms.
The user of this system can also be hospital management who can use it to assign the right doctor to the patient.
The administrator will maintain the system on regular basis.
The administrators will have a wider knowledge of computers and the other users areassumed to have limited computer knowledge.
The interface of the application will be fairly simple and the user will automatically be redirected to the correct page on any input received by the application. The application will be a service with fairly simple interface and would not require and special instructions related to the usage
The system will have simple and easy to use interfaces. All the diseases are present in thedatabase. Provides accurate data.

5.9 NON-FUNCTIONAL REQUIREMENTS (V SHRUTHIY-18BCB0139)

This section describes in detail all the non-functional requirements

5.9.1: USABILITY

1. The system will allow the users to access the application from the Internet.

2. The end users will be able to able to adapt to the system immediately.
3. The system will be always available online.

5.9.2: SECURITY

1. In order to make use of system people with valid login can only make useof sys- tem.

2. Any modifications in the database can be only made by the doctor or theadmin.

Login requirements -

- The doctors and patients will be provided access to the system after they are registered into the database.
- While logging in the system for the first time, the doctors and patients will be provided an ID and a password.
- On logging in, they can set a new password

Password requirements

- Password will be case-sensitive.
- Password must have at least 8 characters.

Inactivity timeouts

- System should timeout when there is no activity for 20minutes.

5.9.3 PERFORMANCE

Response time: The response time will be less than 5 seconds for almost all the processes performed in the system.

5.9.4 CAPACITY

Storage:

Hard disk space –

100 GB – Content

50 B – Transaction Logs

5.9.5 RECOVERY

Recovery time scales

9.5.1.1 The system will be recovered within 12 hours from the down time

Backup Frequencies

1. Details of all the processes carried out by the admin will be stored in the back-up tapes.
2. The back-up data will be updated every 10 days.

5.9.6 AVAILABILITY

Hours of operation

1. The system will be available on all days 24*7

5.9.7 RELIABILITY

Mean Time between Failures

1.1.1.1 The mean time between failures for the system will be 90days

5.9.8 MAINTAINABILITY

Mean Time to Recovery

1. The Mean Time to Recovery (MTTR) shall not exceed one day.

5.9.9 PORTABILITY

OS Requirements

The system will run on windows XP / Vista / 7 / 8 / 8.1 / 10 and on MAC OS and onLINUX.

Browser requirements

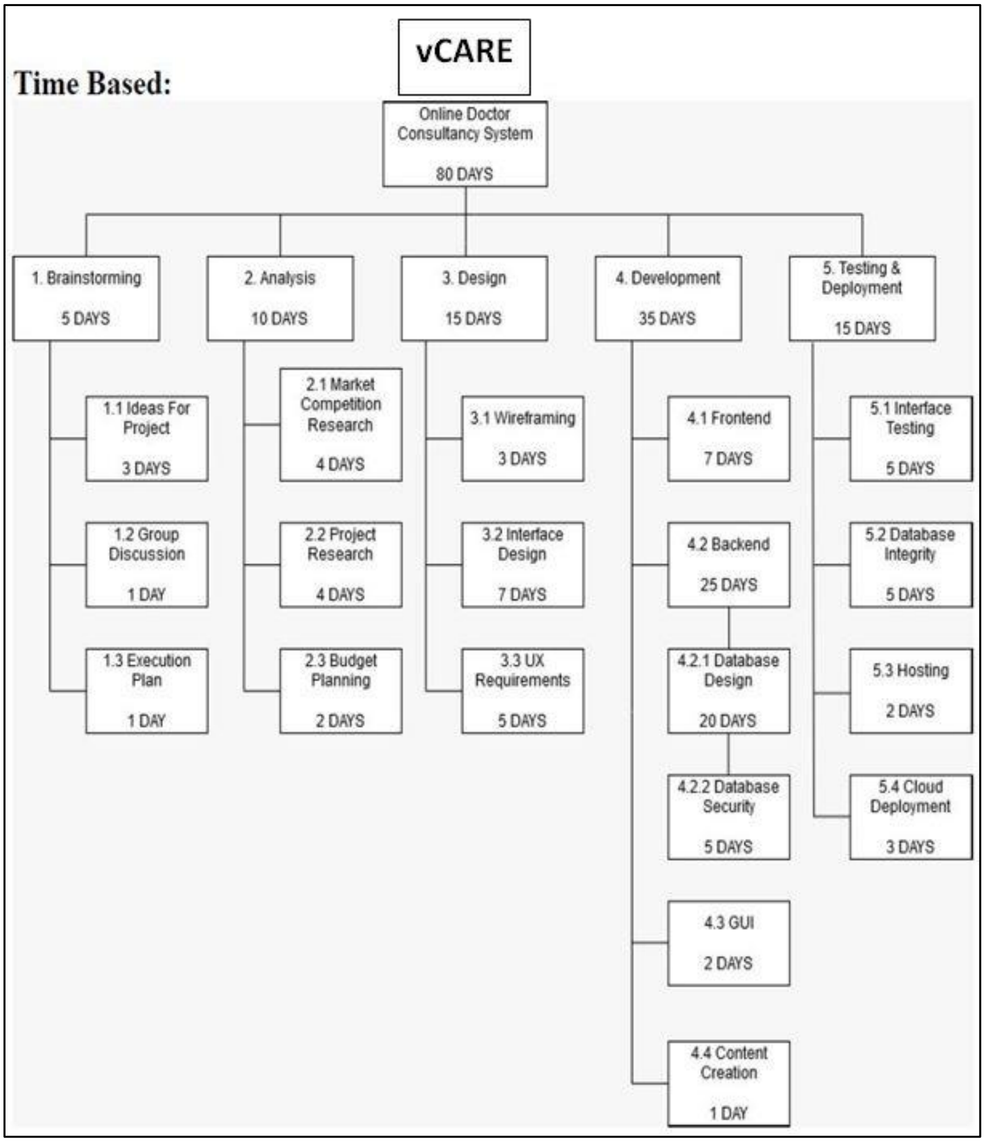
The system will run on Internet Explorer, Internet Edge, Mozilla Firefox, Google Chrome, Safari and UC browser.

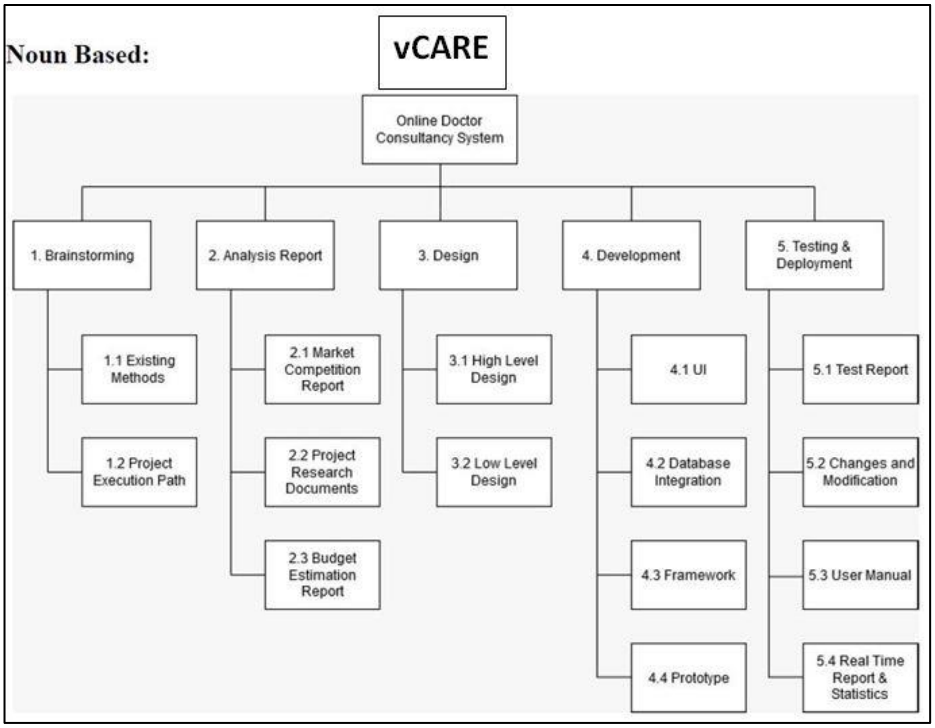
5.9.10 PRIVACY

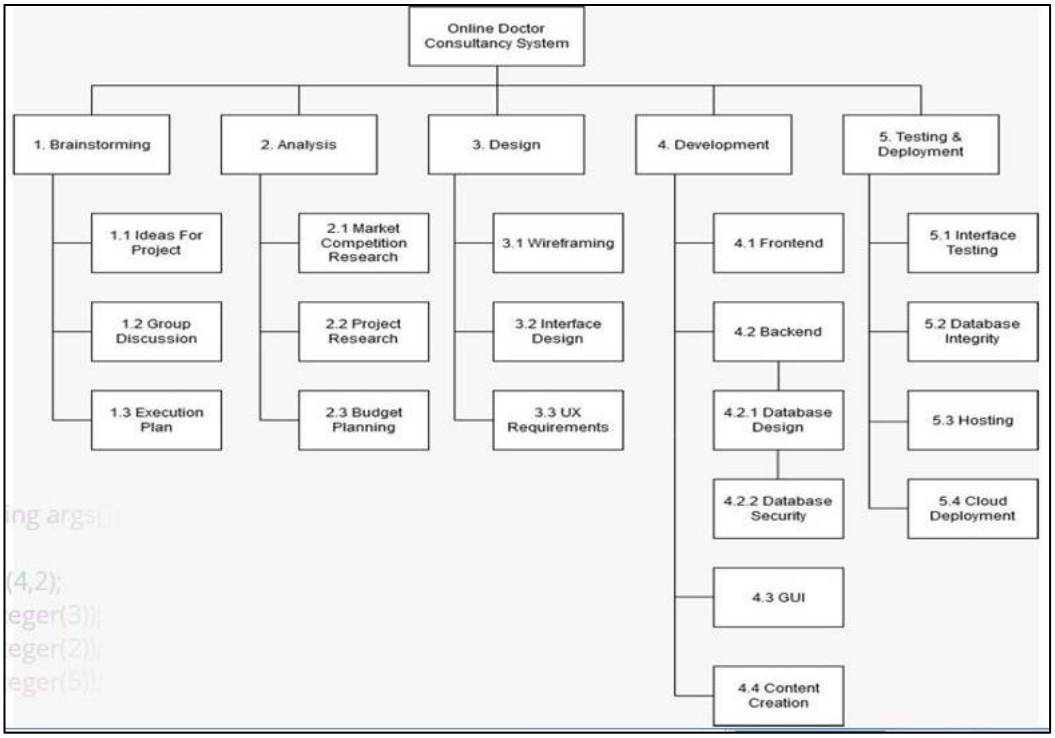
- Reports of one end user cannot be accessed by another end user.
- No two users would be able to view others symptoms and reports.
- Every diagnosis registered by patient would have a unique id.

5.6 DESIGN CONTENTS

6.1: Work Breakdown Structure


vCARE
Time Based:
Online Doctor Consultancy System 80 DAYS
1. Brainstorming 5 DAYS
2. Analysis 10 DAYS
3. Design 15 DAYS
4. Development 35 DAYS
5. Testing & Deployment 15 DAYS
1.1 Ideas For Project 3 DAYS
1.2 Group Discussion 1 DAY
1.3 Execution Plan 1 DAY
2.1 Market Competition Research 4 DAYS
2.2 Project Research 4 DAYS
2.3 Budget Planning 2 DAYS
3.1 Wireframing 3 DAYS
3.2 Interface Design 7 DAYS
3.3 UX Requirements 5 DAYS
4.1 Frontend 7 DAYS
4.2 Backend 25 DAYS
4.2.1 Database Design 20 DAYS
4.2.2 Database Security 5 DAYS
4.3 GUI 2 DAYS
4.4 Content Creation 1 DAY
5.1 Interface Testing 5 DAYS
5.2 Database Integrity 5 DAYS
5.3 Hosting 2 DAYS
5.4 Cloud Deployment 3 DAYS


Noun Based:
vCARE
Online Doctor Consultancy System
1. Brainstorming
1.1 Existing Methods
1.2 Project Execution Path
2. Analysis Report
2.1 Market Competition Report
2.2 Project Research Documents
2.3 Budget Estimation Report
3. Design
3.1 High Level Design
3.2 Low Level Design
4. Development
4.1 UI
4.2 Database Integration
4.3 Framework
4.4 Prototype
5. Testing & Deployment
5.1 Test Report
5.2 Changes and Modification
5.3 User Manual
5.4 Real Time Report & Statistics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5.1 Interface Testing
5.2 Database Integrity
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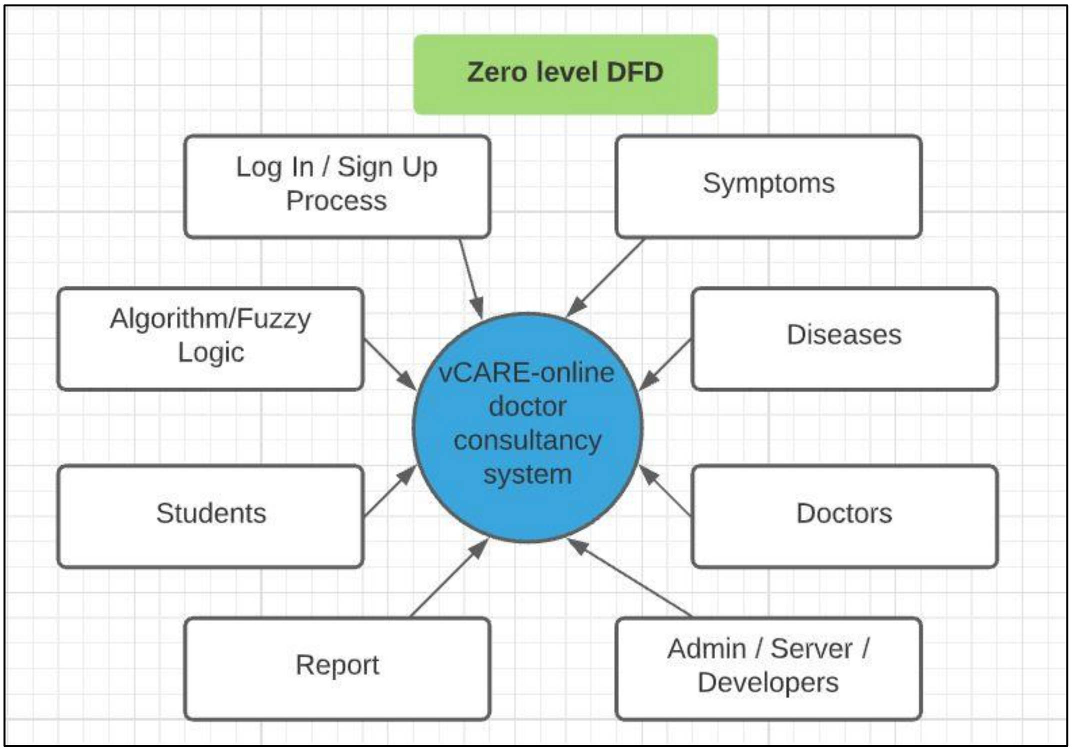
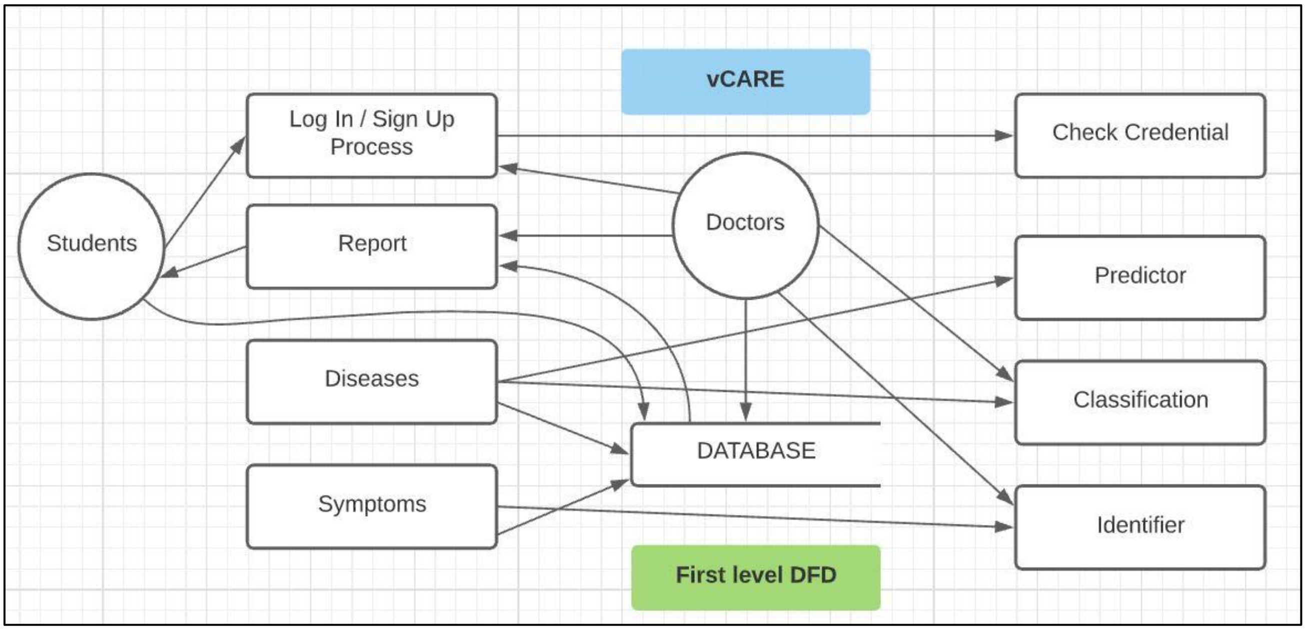
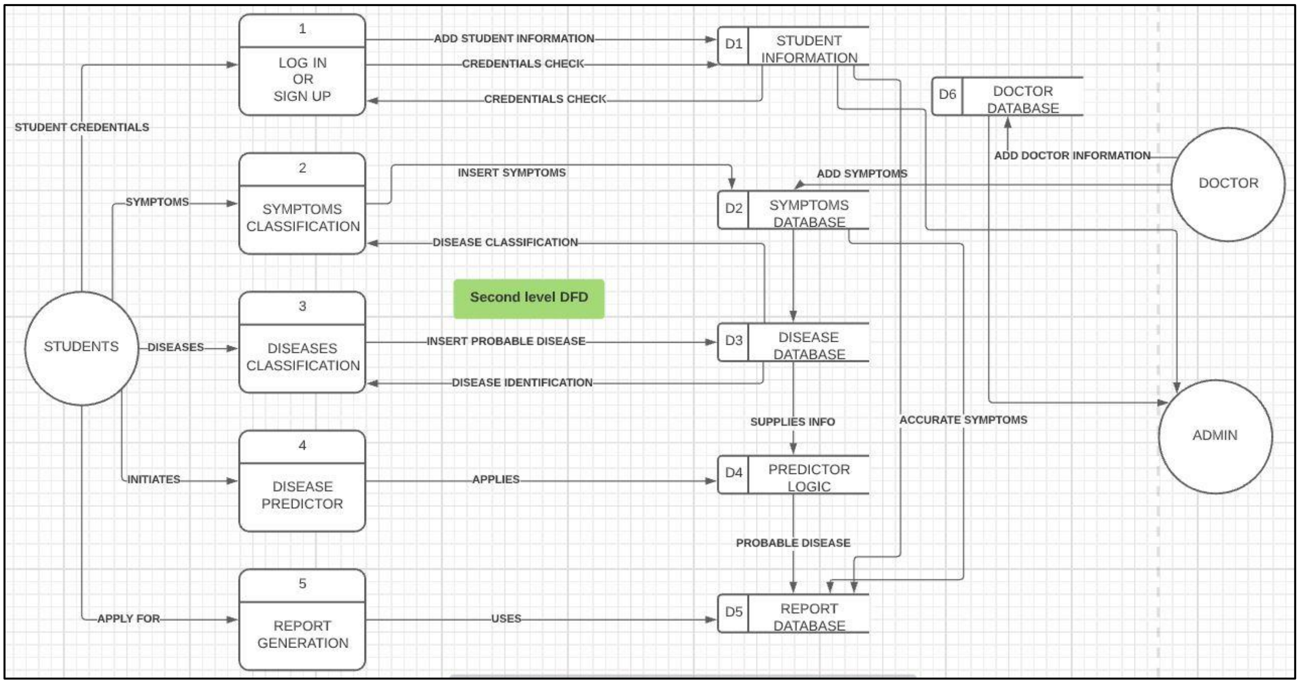
5.4 Cloud Deployment

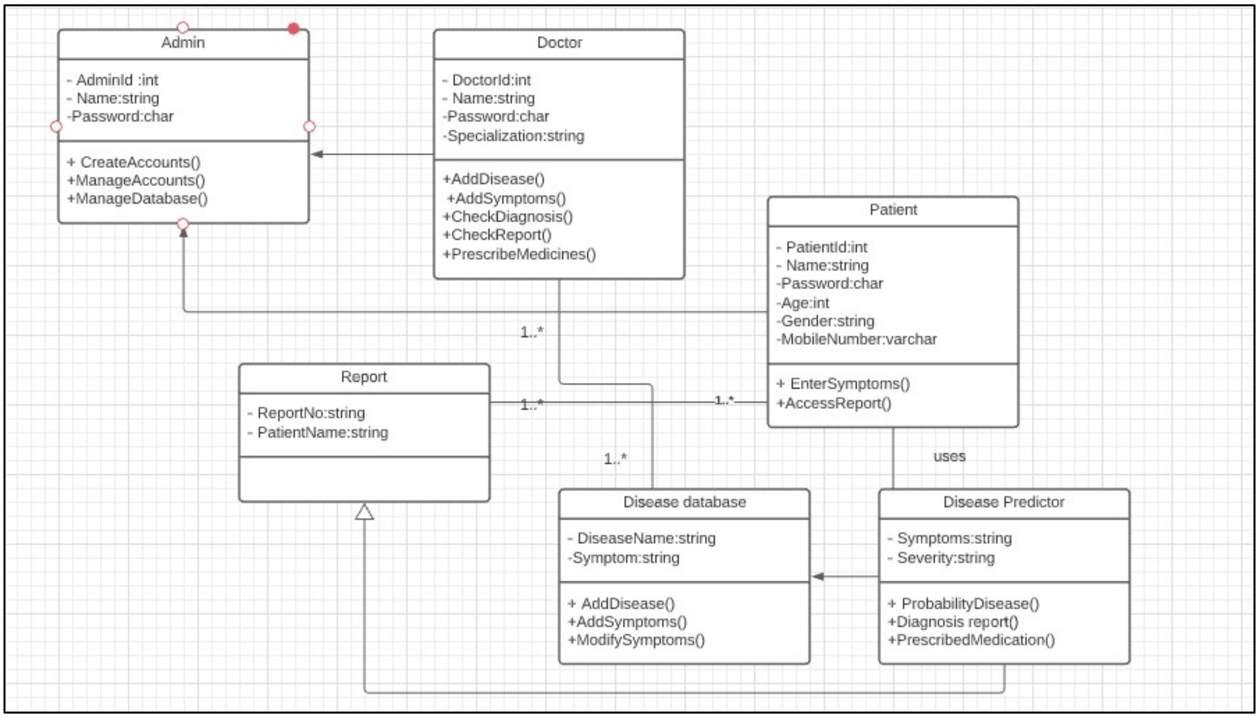
6.2: DFD


Zero level DFD
Log In / Sign Up Process
Symptoms
Algorithm/Fuzzy Logic
vCARE-online doctor consultancy system
Diseases
Students
Doctors
Report
Admin / Server / Developers

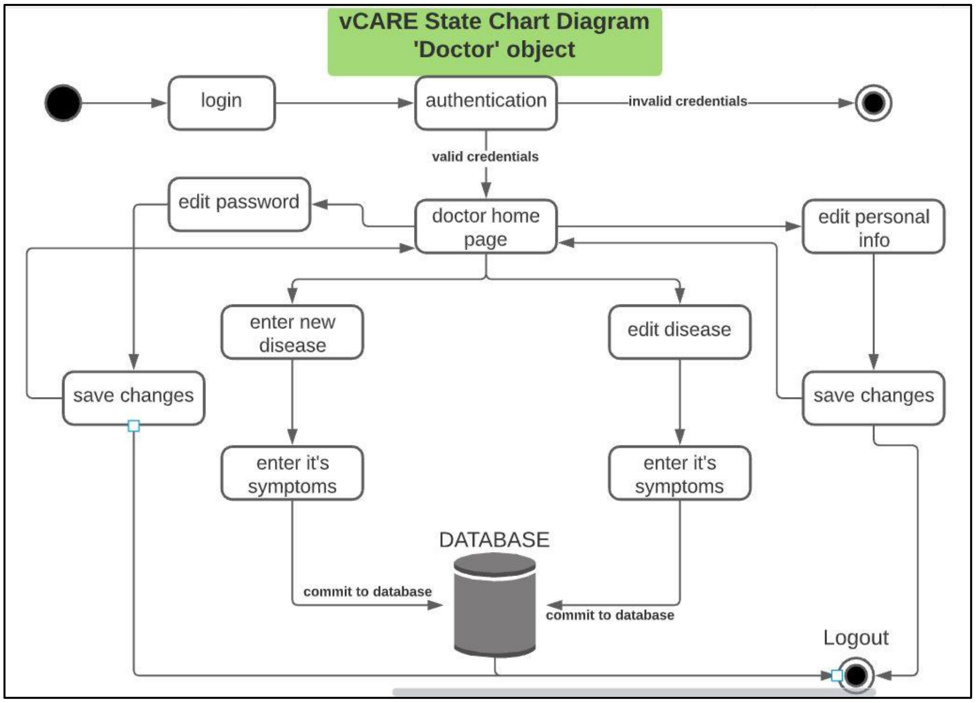

vCARE
Log In / Sign Up Process
Check Credential
Students
Report
Doctors
Predictor
Diseases
Classification
DATABASE
Symptoms
Identifier
First level DFD

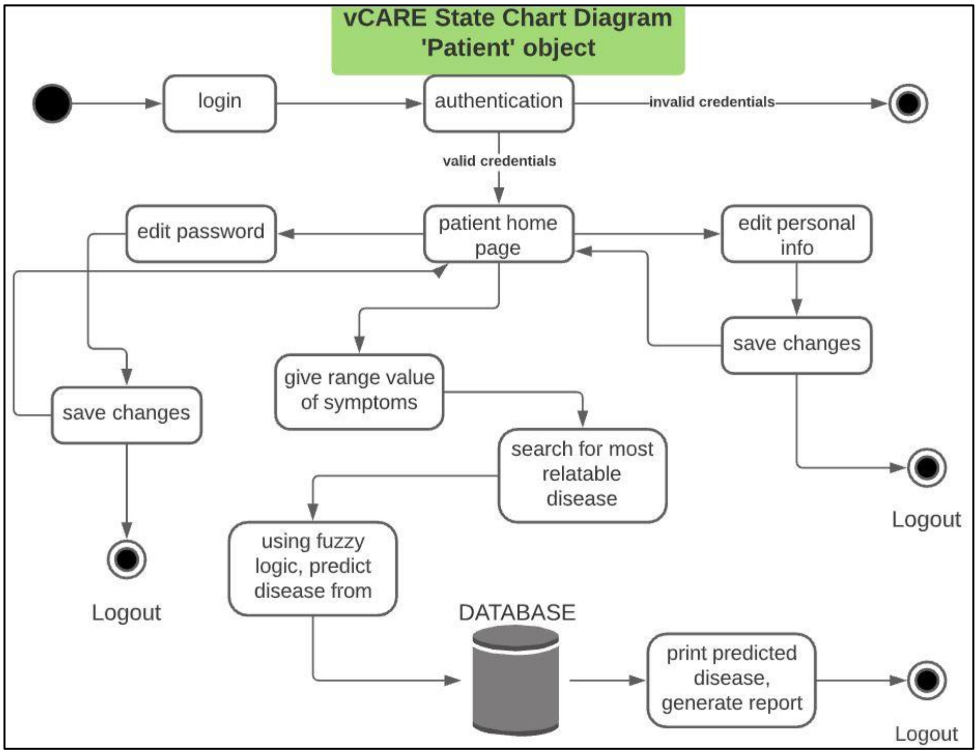


6.3: Class Diagram

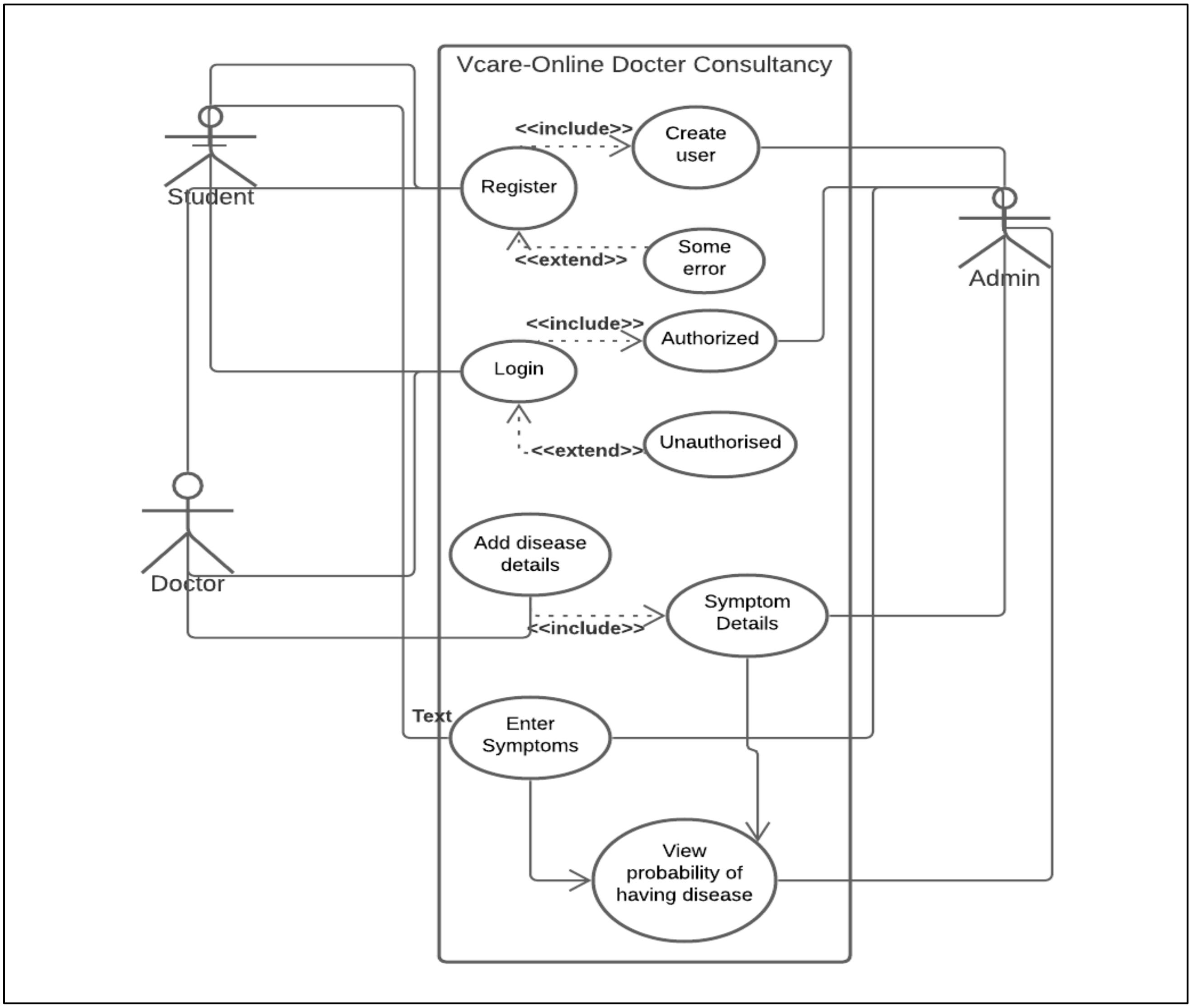


6.4: State chart Diagram

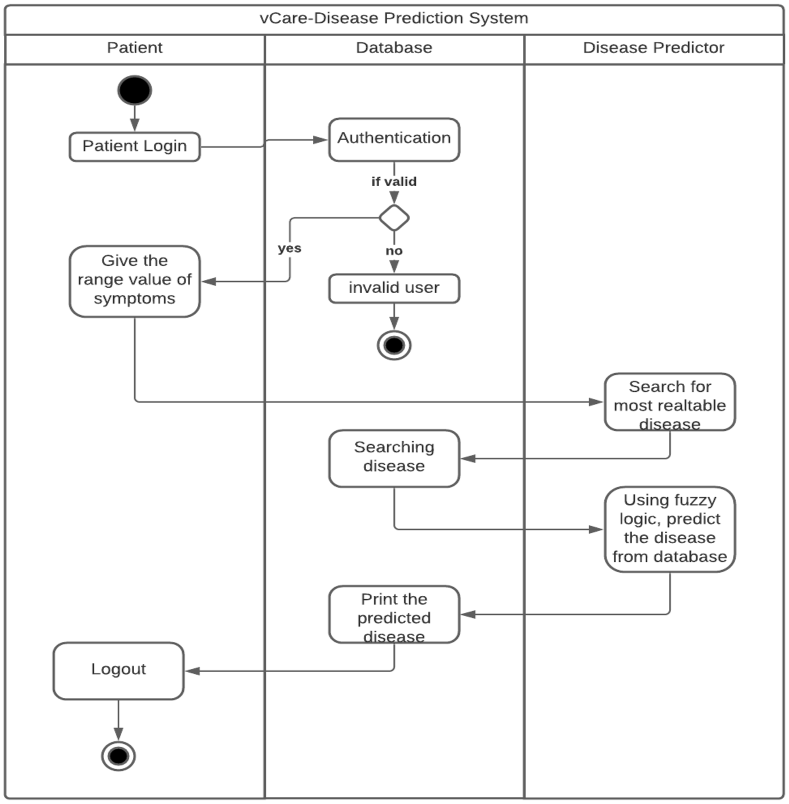


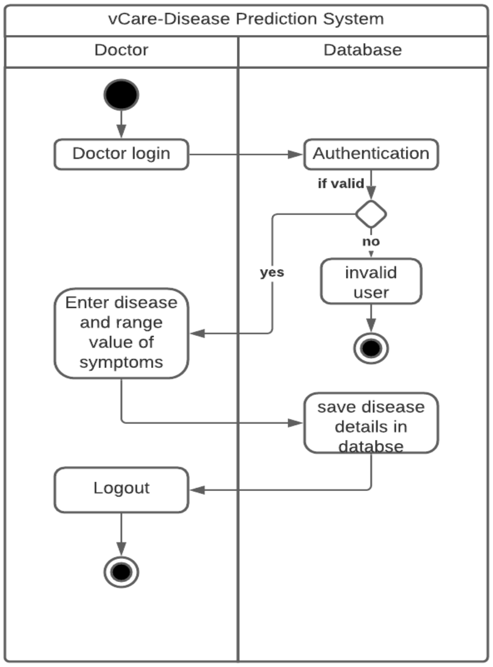


6.5 Use Case Diagram:

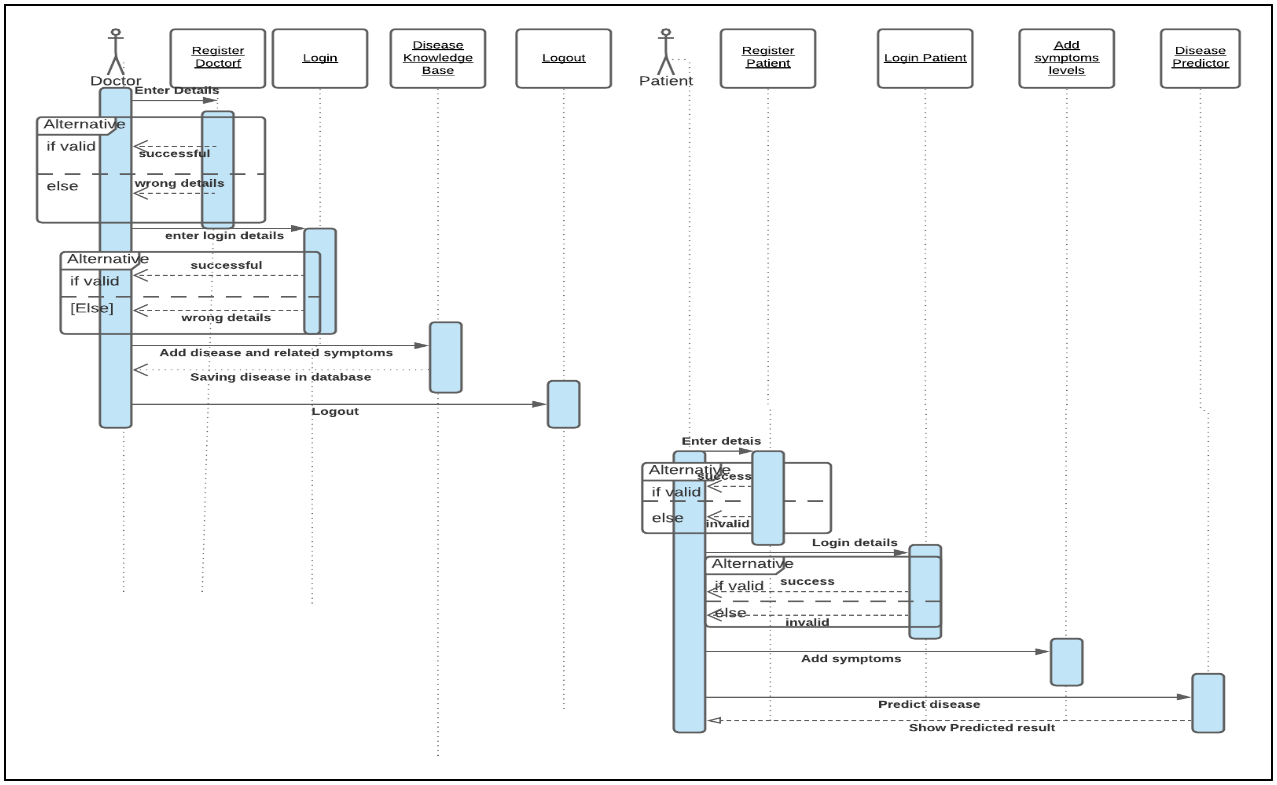


6.6 Activity Diagram:

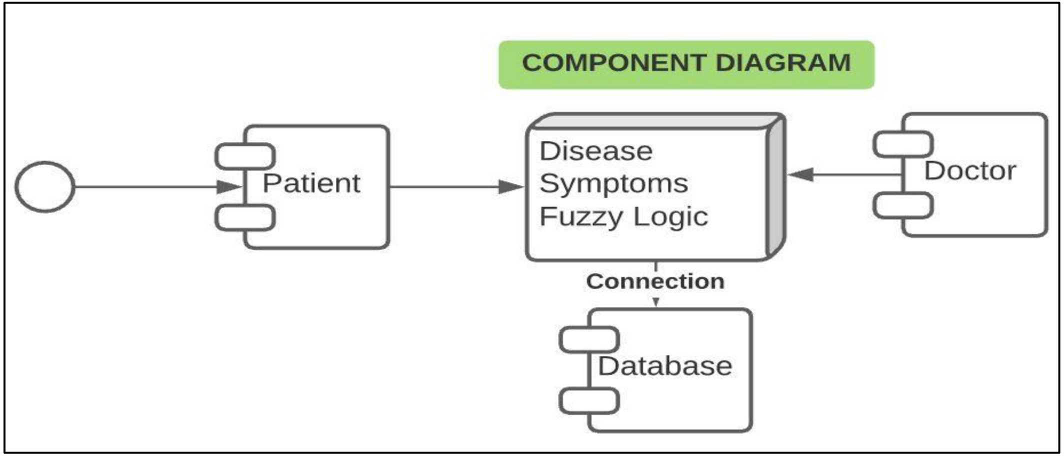

vCare-Disease Prediction System
Patient
Database
Disease Predictor
Patient Login
Authentication
if valid
yes
no
Give the range value of symptoms
invalid user
Search for most realtable disease
Searching disease
Using fuzzy logic, predict the disease from database
Print the predicted disease
Logout


vCare-Disease Prediction System
Doctor
Database
Doctor login
Authentication
if valid
no
yes
invalid user
Enter disease and range value of symptoms
save disease details in databse
Logout

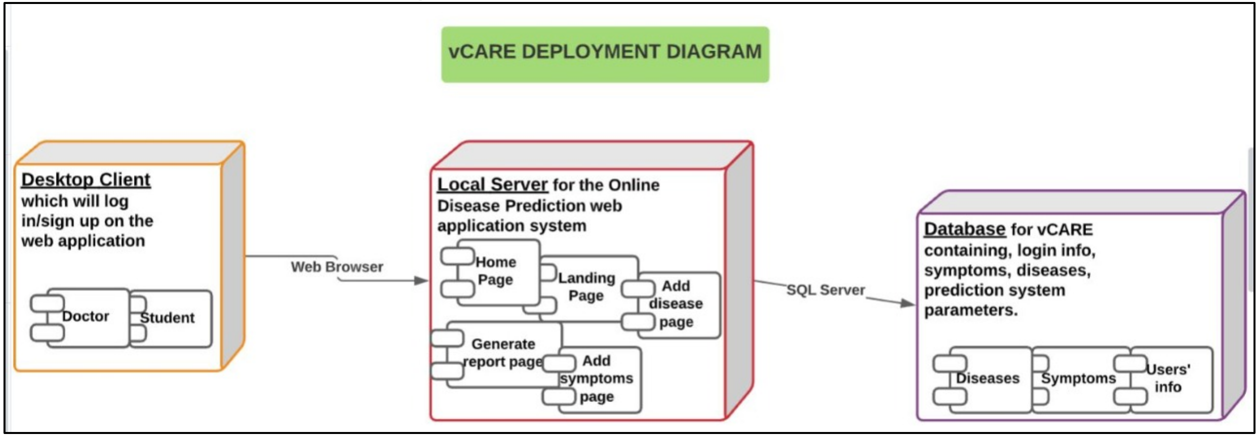
6.7 Sequential Diagram:



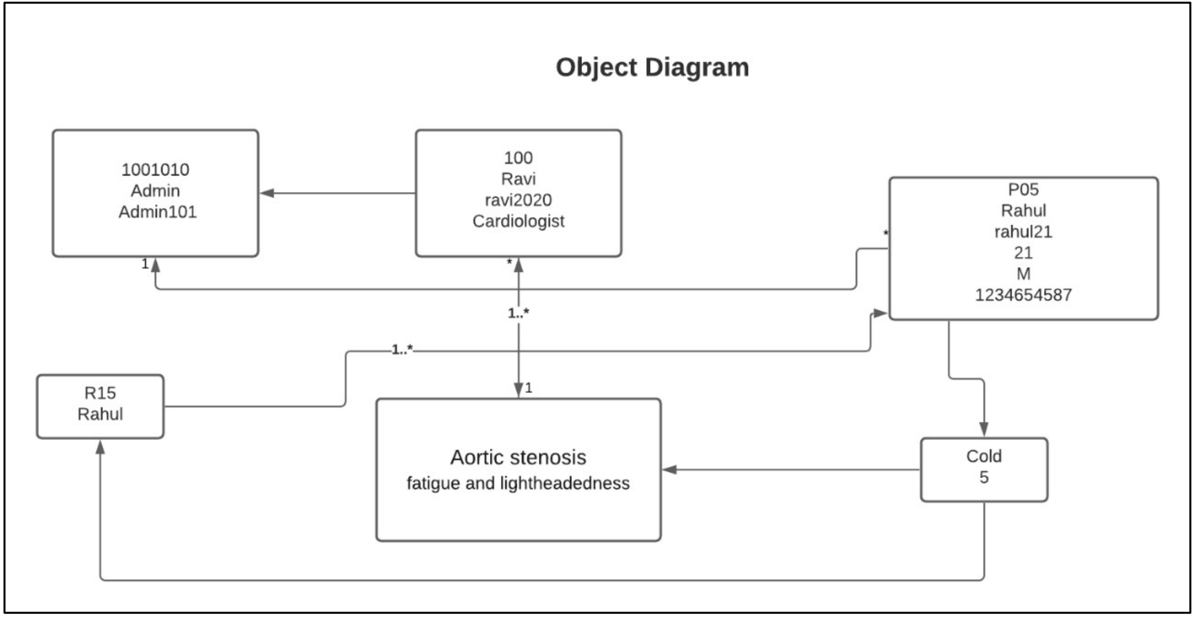
6.8 Component Diagram:



6.9 Deployment Diagram


vCARE DEPLOYMENT DIAGRAM
Desktop Client which will log in/sign up on the web application
Doctor
Student
Web Browser
Local Server for the Online Disease Prediction web application system
Home Page
Landing Page
Add disease page
Generate report page
Add symptoms page
SQL Server
Database for vCARE containing, login info, symptoms, diseases, prediction system parameters.
Diseases
Symptoms
Users' info

6.10 Object Diagram:



6. TEST CASES:

7.1: UNIT TESTINGS

1. On the landing page, verify whether the user type can be selected on clicking on the icon image. (YES)

2. On the landing page, verify whether the hover action works over a sufficient area around the text and the icon image. (YES)

3. On the landing page, verify whether both the login links direct to the correct login pages.(YES)

4. On the login pages, verify whether the system accepts invalid input too for log in. (NO)

5. On the login pages, verify whether the system allows user to login with a single input(email or password) (NO)

6. On the login page, verify if a user will be able to login with valid email id and password(YES)

7. On the registration page, verify whether the system allows user to create an account with not filling all inputs (NO)

8. Verify whether a patient user gets directed to the correct user form page on login. (YES)

9. On the user form page, verify if a user will be able to select discrete value of symptoms from drop down. (YES)

10. On the user form page, verify if a user is able to select the range value of symptoms from drop down. (YES)

11. On the user from page, verify if the user gets directed to the results page on clicking on button 'Evaluate Symptoms'. (YES)

12. On the results page, verify if the user is able to view precautions for the predicted disease?
Yes

13. On the results page, verify if the user is able to access nearby doctors using the feature available on the system?
Yes

14. Verify whether a doctor user gets directed to the correct user form page on login. (YES)

15. On the doctor's page after login, verify if a user is able to get the details of a disease on clicking disease details. (YES)

16. Verify if on clicking test accuracy for a disease, the user is directed to the testing page and the results are displayed. (YES)

17. Verify if a user will be able to add disease in disease knowledge base. (YES)

18. Verify whether the system allows doctor to proceed with adding symptoms for a disease by missing one of the entries among Disease name, Specialist and precautions. (NO)

19. Verify whether the system allows doctor to add a symptom for a disease by missing one of the entries among Symptom name, number and weight (NO)

20. Verify whether the system allows doctor to add discrete values as fuzzy values. (YES)

21. Verify whether the system allows doctor to add range values as fuzzy values. (YES)

22. Verify whether the system automatically puts up the minimum value for the next range. (YES)
23. Verify whether the system allows user to select between yes, maybe and no for all the fuzzy values.(YES)

24. Verify whether clicking on save button after adding the symptoms adds the disease adds the symptom to the database. (YES)

25. Verify if the user is redirected back to home page after logging out from the system by clicking on the logout button at any time.? (YES)

Test Case ID	Test Case	Test Data	Expected Results	Actual Results	Comments	Pass / Fail
1	Click on one of the icon (patient/doctor)	Click on specific icon	Login process for the specific category should starts.	Login process for the specific category starts.		Pass
2	Click anywhere on an area around the icon	Click around the patient icon	Patient login should open	Patient login opens		Pass
3	Click on one of the icon/text	Click on patient icon/text	Patient login should opens	Patient login opens		Pass
4	Enter an invalid input for login	Email = abc , password = abc	System should prompt an error	System prompts an error		Pass
5	Enter a single input for login	Email = abc@gmail.com	System should prompts an error	System prompts an error		Pass
6	Enter a valid input for login	Email = abc@gmail.com , password = abc	User should be able to log in to the software	User logs in to the software		Pass
7	Enter less than 4 inputs for registration	First Name = abc, Second Name = abc, Email = abc@gmail.com, Password = abc	User should be ble to log in to the software	User logs in to the software		Pass

8	Click on Login for patient category	Email = abc@gmail.com , password = abc	Patient user form should open	Patient user form opens		Pass
9	Select discrete symptom values from dropdown in symptoms column.	chest pain as 1	Chosen chest pain value should get selected	Chosen Chest pain value should get selected		Pass
10	Select range symptom values from dropdown in symptoms column.	Cholesterol value as 99-177	Chosen Cholesterol level should get selected	Chosen Cholesterol level gets selected		Pass
11	Select symptoms and click on ‘Evaluate Symptoms’	Symptoms selected. Press Evaluate Symptoms button	Result Page should open up in a new tab	Result page opens in a new tab		Pass
12	Click on precautions for any disease from the list corresponding to one of the disease.	Click on precautions button in the column for heart disease.	Precautions should be shown to the users for heart disease.	Heart disease precautions are displayed		Pass
13	Observe under the table of diseases.	Slide down the table of disease lists	Doctor nearby the location of the system should be shown	Doctors nearby the area of the system is displayed	User should allow browser to permit the site to access location	Pass
14	Click on Login for doctor category	Email = abc@gmail.com , password = abc	Doctor disease list should open	Doctor disease list opens		Pass
15	Click on disease details corresponding to one of the disease	Click on disease details button for heart disease	Disease Details of heart disease should get displayed	Heart disease details get displayed		Pass
16	Click on test accuracy for any disease	Click on test accuracy for heart disease.	Heart disease testing results should get displayed	Heart disease testing results are displayed	This takes a large amount of time because of extensive Javascript implementation of fuzzy logic	Pass
17	Add disease to the database with all its symptoms and click on save button	Disease name = Lung Disease, Specialist = Pulmonologist, Precautions: Exercise and healthy diet,	Lung Disease should get added to the database.	Lung Disease gets added to the database.	This added disease will be visible on the patient disease severity prediction interface too.	Pass

		Symptom : difficulty in breathing, number = 3, weight= 0.9, fuzzy values: 2, Yes; 1, Maybe; 0, No				
18	Add Disease to the database by missing at least one parameter from the disease name, disease specialist and precautions	Disease name = Lung Disease, Specialist = Pulmonologist	System should prompt the user to enter all the entries	Systems prompts the user to enter precautions too.	The prompt works in an order by checking for disease name first, specialist next and precautions at the last.	Pass
19	Add symptom for a disease to the database by missing at least one parameter from the the symptom name, number and weight	Disease name = Lung Disease, Specialist = Pulmonologist, Precautions: Exercise and healthy diet, Symptom : difficulty in breathing, number = 3,	System should prompt the user to enter all the entries	Systems prompts the user to enter weight too.	The prompt works in an order by checking for disease details first, symptom name next, number next and weight at the last.	Pass
20	Add discrete values as fuzzy logic values in the database for symptoms.	Disease name = Lung Disease, Specialist = Pulmonologist, Precautions: Exercise and healthy diet, Symptom : difficulty in breathing, number = 3, weight= 0.9, fuzzy values: 2, Yes; 1, Maybe; 0, No	Disease should get added to the database with the specified symptom.	Disease gets added to the database with the symptoms details too.		Pass
21	Add range values as fuzzy logic values in the database for symptoms.	Disease name = Lung Disease, Specialist = Pulmonologist, Precautions: Exercise and healthy diet,	Disease should get added to the database with the specified symptom.	Disease gets added to the database with the symptoms details too.		Pass

		Symptom: Oxygen level, number = 3, weight= 5.7, fuzzy values: 60-92, Yes; 93-95, Maybe; 96-99, No				
22	While adding the symptoms in a range, add one range’s maximum value and observe for the next range	Disease name = Lung Disease, Specialist = Pulmonologist, Precautions: Exercise and healthy diet, Symptom: Oxygen level, number = 3, weight= 5.7, fuzzy values: 60-92,	The next range should set minimum value as 93 by the system	The next range’s minimum value is set as 93	There is no option to change this. It gets fixed and not editable.	Pass
23.	Enter the disease details and in symptoms after adding fuzzy values, select yes/no/maybe from the dropdown.	Disease name = Lung Disease, Specialist = Pulmonologist, Precautions: Exercise and healthy diet, Symptom: Oxygen level, number = 3, weight= 5.7, fuzzy values: 60-92, Yes; 93-95, Maybe; 96-99, No	Yes/Maybe/No should get selected on user’s click and take correct predictions for calculations of severity levels using fuzzy logic.	Yes/Maybe/No gets selected on click and calculations take the correct evaluation of these inputs.		Pass
23	Click on save button after adding the disease and the symptoms	Disease name = Lung Disease, Specialist = Pulmonologist, Precautions: Exercise and healthy diet, Symptom: Oxygen level, number = 3, weight= 5.7, fuzzy values: 60-92, Yes; 93-95, Maybe; 96-99,	User should be notified on successful addition of disease to the database and data should also get correctly entered in the database.	Prompt displays disease added to the database. And data gets reflected in the database too.		Pass

		No				
24	Enter all the details and click on save button.	Disease name = Lung Disease, Specialist = Pulmonologist, Precautions: Exercise and healthy diet, Symptom: Oxygen level, number = 3, weight= 5.7, fuzzy values: 60-92, Yes; 93-95, Maybe; 96-99, No	Disease data should get saved in the database	Disease Data gets saved in the database correctly.		Pass
25	Click on logout button on any page	Logout button pressed	User should get redirected to the landing page of the website.	User gets directed to the landing page of the website.	This option is removed from the testing page to avoid testing to stop suddenly on click and further crash the site or lead to any incorrect results.	Pass

7.2 USABILITY TESTING

The usability evaluation of the **vCare Disease Prediction System** was conducted by **Group Number: 13** on **28.05.2021**

During the usability evaluation, **four** participants, matching the user profile(s), were asked to spend one hour with the site. During this hour, participants:

Completed a user background questionnaire
Answered questions about initial site impressions
Performed real-world tasks on the site while thinking aloud
Answered questions about their overall satisfaction

Participants, having the following profile characteristics, evaluated vCare Disease Prediction System.

Audience Type

Participant Number	Participant Name	Participant Registration Number
1	Rishita Reddy Chilla	18BCB0140
2	Swaraj Trivedi	18BCB0101
3	Parnika Rajendra	18BCB0067
4	Vishal R	19BCE0695

Age

Category	Number of participants
18-25	4
26-39	0
40-59	0
60-74	0

Gender

Category	Number of participants
Female	2
Male	2

Following is a summary of the participants' computing environment:

URL of tested website:	N/A
Computer platforms:	Windows
Browser tested:	Chrome
Screen resolution:	1536 x 864
Operating system:	Windows
Connection speed:	7 MBPS

The following tasks were identified from user data collection efforts and assistance from Team Number: 13 .

#	Task
1	Verify whether the landing page is intuitive enough for user to get directed to their logins (doctor and patient separate)
2	Verify whether the login page took only required necessary inputs.
3	Verify whether the directing for the sign up process in case an account does not exists is already easy
4	Verify whether the sign up page took only necessary inputs to create an account
5	Verify whether the page is displayed correctly after the login with the users' own account.
6	Verify whether the map shown covers the exact neighborhood areas of the user and the

	pointers marked at doctors are correct.
7	Verify whether on the doctors' login, accuracy testing page displays the results correctly and clearly, thus making it easier to analyze the accuracy of any disease data.
8	Verify whether the ‘Register Here!!’ page has all necessary text boxes to create account (First Name, Last Name, Email Address, Password).
9.	Verify whether the user knows which page he/she is currently navigating through page headers like ‘select symptoms’, ‘predict disease’, etc.
10	Verify whether Symptom, Value, and Symptom Description have right ranges and parameters (inclusive/exclusive).
11	Verify whether there is a navigation flow as a basic principle of heuristic evaluation for first time users.
12	Verify whether for each and every disease, there is it's respective severity, a prediction result and precaution page (HTML).
13	Verify whether the disease knowledge base (for add disease) has disease name, specialist and precautions dialog box in working condition with features to add symptom details.
14	Verify whether the fuzzy logic algorithm is consistent in it's results (output) for the same symptoms (input parameters) through a dry run.
15	Verify whether there is an option to save the details.

TESTS:

Participant 1 (18BCB0140 , Rishita Reddy Chilla) Observer (18BCB0087, Maitreyee Paliwal)	**Passed or failed**	**Time taken**	**Interface is good/bad/ok**
Verify whether the landing page is intuitive enough for user to get directed to their logins (doctor and patient separate)	Passed	2s	Good
Verify whether the login page took only required necessary inputs.	Passed	4s	Good
Verify whether the directing for the sign up process in case an account does not exists already easy	Passed	2s	Good
Verify whether the sign up page took only necessary inputs to create an account.	Passed	4s	Good
Verify whether the page is displayed correctly after the login with the users' own account.	Passed	2s	Good
Verify whether the map shown covers the exact neighborhood areas of the user and the pointers marked at doctors are correct.	Passed	2s	Good
Verify whether on the doctors' login, accuracy testing page displays the results correctly and clearly, thus making it easier to analyze the accuracy of any disease data.	Passed	5s	Good

Verify whether the 'Register Here!!' page has all necessary text boxes to create account (First Name, Last Name, Email Address, and Password).	Passed	3s	Good
Verify whether the user knows which page he/she is currently navigating through page headers like ‘select symptoms’, ‘predict disease’, etc.	Passed	2s	Good
Verify whether Symptom, Value, and Symptom Description have right ranges and parameters (inclusive/exclusive).	Passed	2s	Good
Verify whether there is a navigation flow as a basic principle of heuristic evaluation for first time users.	Passed	3s	Good
Verify whether for each and every disease, there is it's respective severity, a prediction result and precaution page (HTML).	Passed	3s	Good
Verify whether the disease knowledge base (for add disease) has disease name, specialist and precautions dialog box in working condition with features to add symptom details.	Passed	3s	Good
Verify whether the fuzzy logic algorithm is consistent in it's results (output) for the same symptoms (input parameters) through a dry run	Passed	4s	Good
Verify whether there is an option to save the details.	Failed	2s	Good

Participant 2 (Parnika Rajendra-18BCB0067) **Observer(V Shruthiy-18BCB0139)**	**Passed or Failed**	**Time taken**	**Interface is good ,bad or okay**
Verify whether the landing page is intuitive enough for user to get directed to their logins (doctor and patient separate)	Passed	2s	Good
Verify whether the login page took only required necessary inputs.	Passed	4s	Good
Verify whether the directing for the sign up process in case an account does not exists already easy	Passed	2s	Good
Verify whether the sign up page took only necessary inputs to create an account.	Passed	4s	Good
Verify whether the page is displayed correctly after the login with the users' own account.	Passed	2s	Good
Verify whether the map shown covers the exact neighborhood areas of the user and the pointers marked at doctors are correct.	Passed	2s	Good
Verify whether on the doctors' login, accuracy testing page displays the results correctly and clearly, thus	Passed	5s	Good

making it easier to analyze the accuracy of any disease data.			
Verify whether the 'Register Here!!' page has all necessary text boxes to create account (First Name, Last Name, Email Address, and Password).	Passed	3s	Good
Verify whether the user knows which page he/she is currently navigating through page headers like ‘select symptoms’, ‘predict disease’, etc.	Passed	2s	Good
Verify whether Symptom, Value, and Symptom Description have right ranges and parameters (inclusive/exclusive).	Passed	2s	Good
Verify whether there is a navigation flow as a basic principle of heuristic evaluation for first time users.	Passed	3s	Good
Verify whether for each and every disease, there is it's respective severity, a prediction result and precaution page (HTML).	Passed	3s	Good
Verify whether the disease knowledge base (for add disease) has disease name, specialist and precautions dialog box in working condition with features to add symptom details.	Passed	3s	Good
Verify whether the fuzzy logic algorithm is consistent in it's results (output) for the same symptoms (input parameters) through a dry run	Passed	4s	Good
Verify whether there is an option to save the details.	Failed	2s	Bad

Participant 2 (18BCB0101, Swaraj Trivedi) **Observer (18BCB0027, Abhishek Mishra)**	**Passed or Failed**	**Time taken**	**Interface is good ,bad or okay**
Verify whether the landing page is intuitive enough for user to get directed to their logins (doctor and patient separate)	Passed	2.5s	Good
Verify whether the login page took only required necessary inputs.	Passed	3s	Good
Verify whether the directing for the sign up process in case an account does not exists already easy	Passed	3s	Good
Verify whether the sign up page took only necessary inputs to create an account.	Passed	3.5s	Good
Verify whether the page is displayed correctly after the login with the users' own account.	Passed	3s	Good
Verify whether the map shown covers the exact neighborhood areas of the user and the pointers marked at doctors are correct.	Passed	3s	Good

Verify whether on the doctors' login, accuracy testing page displays the results correctly and clearly, thus making it easier to analyze the accuracy of any disease data.	Passed	5.5s	Good
Verify whether the 'Register Here!!' page has all necessary text boxes to create account (First Name, Last Name, Email Address, and Password).	Passed	3.5s	Good
Verify whether the user knows which page he/she is currently navigating through page headers like ‘select symptoms’, ‘predict disease’, etc.	Passed	2.5s	Good
Verify whether Symptom, Value, and Symptom Description have right ranges and parameters (inclusive/exclusive).	Passed	3s	Good
Verify whether there is a navigation flow as a basic principle of heuristic evaluation for first time users.	Passed	3.5s	Good
Verify whether for each and every disease, there is it's respective severity, a prediction result and precaution page (HTML).	Passed	4s	Good
Verify whether the disease knowledge base (for add disease) has disease name, specialist and precautions dialog box in working condition with features to add symptom details.	Passed	3.5s	Good
Verify whether the fuzzy logic algorithm is consistent in it's results (output) for the same symptoms (input parameters) through a dry run	Passed	4s	Good
Verify whether there is an option to save the details.	Failed	2.5s	Good

Participant4(***19BCE0695, Vishal R***) Observer (***19BCI0232, Sahitya Madipalli***)	**Passed or Failed**	**Time taken**	**Interface is good ,bad or okay**
Verify whether the landing page is intuitive enough for user to get directed to their logins (doctor and patient separate)	Passed	3s	Good
Verify whether the login page took only required necessary inputs.	Passed	3s	Good
Verify whether the directing for the sign up process in case an account does not exists already easy	Passed	3s	Good
Verify whether the sign up page took only necessary inputs to create an account.	Passed	4s	Good
Verify whether the page is displayed correctly after the login with the users' own account.	Passed	3.5s	Good
Verify whether the map shown covers the exact neighborhood areas of the user and the pointers marked at doctors are correct.	Passed	3.5s	Good

Verify whether on the doctors' login, accuracy testing page displays the results correctly and clearly, thus making it easier to analyze the accuracy of any disease data.	Passed	6s	Good
Verify whether the 'Register Here!!' page has all necessary text boxes to create account (First Name, Last Name, Email Address, and Password).	Passed	4s	Good
Verify whether the user knows which page he/she is currently navigating through page headers like ‘select symptoms’, ‘predict disease’, etc.	Passed	3s	Good
Verify whether Symptom, Value, and Symptom Description have right ranges and parameters (inclusive/exclusive).	Passed	4s	Good
Verify whether there is a navigation flow as a basic principle of heuristic evaluation for first time users.	Passed	4s	Good
Verify whether for each and every disease, there is it's respective severity, a prediction result and precaution page (HTML).	Passed	4.5s	Good
Verify whether the disease knowledge base (for add disease) has disease name, specialist and precautions dialog box in working condition with features to add symptom details.	Passed	4s	Good
Verify whether the fuzzy logic algorithm is consistent in it's results (output) for the same symptoms (input parameters) through a dry run	Passed	4.5s	Good
Verify whether there is an option to save the details.	Failed	3s	Good

7.3 EXIT QUESTIONS/USER IMPRESSIONS

At the end of each session, we asked participants these questions:

- What is your overall impression of the site?
- What is your impression of the search capability?
- Do you feel this site is current? Why?
- What did you like best about the site?
- What did you like least about the site?
- If you were the website developer, what would be the first thing you would do to improve the website?
- Is there anything that you feel is missing on this site? (Probe: content or site features/functions)

- If you were to describe this site to a colleague in a sentence or two, what would you say?
- Do you have any other final comments or questions?

Participant Name| Observer Name	**Question**	**Answer**
18BCB0140 , Rishita Reddy Chilla ***18BCB0087, Maitreyee Paliwal***	What is your overall impression to this web application?	It was really good. I liked the objective or aim behind this. And also the simple and easy to walkthrough and wonderful UI altogether. The functionalities provided like the display of severity levels along with the precautionary measures specific for the particular disease and the maps part where doctors nearby your area is shown is wonderful. The customer side form for the symptoms was also easy as fuzzy logic provides easier to choose inputs options for the users too.
	What is your impression of the search capability?	To me, the site was amazing. It has a great scope to be launched on the Web. It provides the perfect functionalities for a disease prediction system. Users will find it much more comfortable to evaluate the severity risks of different diseases from their own systems. And doctors can also provide simple information on their side easily with the organized method of adding diseases.
	Do you feel this site is current? Why?	Yes, of course, this site is the need of the hour. We are currently passing through the pandemic which has made social distancing and

		quarantining important and frequently going outside is discouraged. This calls for the need of a system like this to check the disease severity from the patients' home.
	What did you like best about the site?	I liked the best the user input in the form of Fuzzy Logic ranges. It seems to be much easier for the user to give input and the system to evaluate the disease severity with greater precision. And the way, doctors can test their fuzzy disease systems is amazing.
	What did you like least about the site?	One thing that I think is missing is that the doctors can create an account directly. There is no input of a degree or something that proves their practice and field. If you guys plan to ever launch this site, u can either involve more people to check their degrees and then accept their registration or some other easier computational practice could be used.
	If you were the website developer, what would be the first thing you would do to improve the website?	Yes, I am a website developer indeed, much more focused in the UX, UI. The site however is wonderfully built, with all units perfect. I don't think it needs any improvement in the functionalities or the UI. But, if one improvement I myself could do, it would be to provide already load this website with more data on diseases This is because at launching to attract more customers, we need to ensure there is already enough information available for disease prediction.

	Is there anything that you feel is missing on this site? (Probe: content or site features/functions)	Yes, like I have already said, there could be more diseases information in the database existing already. You can collect this data from some legitimate sources, be it WHO or KEGG or some other website. And with the very own functionality of testing, it could be tested on this application itself
	If you were to describe this site to a colleague in a sentence or two, what would you say?	It could be 'Disease Severity Prediction Web Application that yields very accurate results and is extremely easy, intuitive and appealing. Best Solution in lockdown, chronic diseases, aged people and emergency cases to prevent unnecessary hospital visits'.
	Do you have any other final comments or questions?	Yes, I would definitely comment that it is a beautiful website with a beautiful aim designed in the best way. And I suggest you all should present this application to some organization so that this could be used for the general public and serve its aims best. And as already said, you can add more diseases databases. Also, you can look for more features like when doctors nearby are shown, you can display the contact details or emergency dials for ambulance, etc. And the doctors' login could be made more legitimate by asking for doctors' degree or proof of their practice.
18BCB0101, Swaraj Trivedi ***18BCB0027, Abhishek Mishra***	How would you describe your overall impression of this web application?	It was fantastic. I loved the goal and objective of this. Also, the overall user interface is basic and easy to

		navigate. . The symptoms form on the customer's side was likewise simple. The features provided, such as the display of severity levels combined with specific precautionary measures for each ailment, and the maps section, which shows doctors in your area, are fantastic.
	What is your impression of the disease prediction capability of the website?	Well , the main function of the website is predicting disease. And it seems to be fairly accurate on predicting the disease. Also the amount of time required is not excessive. One have to only enter the symptoms range values and within seconds of time , the website is able to predict the most relatable disease.
	Do you feel this site is current? Why?	Of course, this website is really needed. We are currently experiencing a pandemic, which has made social isolation and quarantining necessary, and frequent outdoor activity is discouraged. This necessitates the use of a device like this to monitor the severity of the sickness from the patients' homes.
	What did you like best about the site?	I think overall the website is great, but if asked about the particular feature ,I will say the best advantage of this website is that it provide doctors to enter the symptoms and precautions related to a particular disease. The feature of showing nearby doctors is also highly impressive.
	What did you like least about the site?	I believe that a patient's ability to enter new

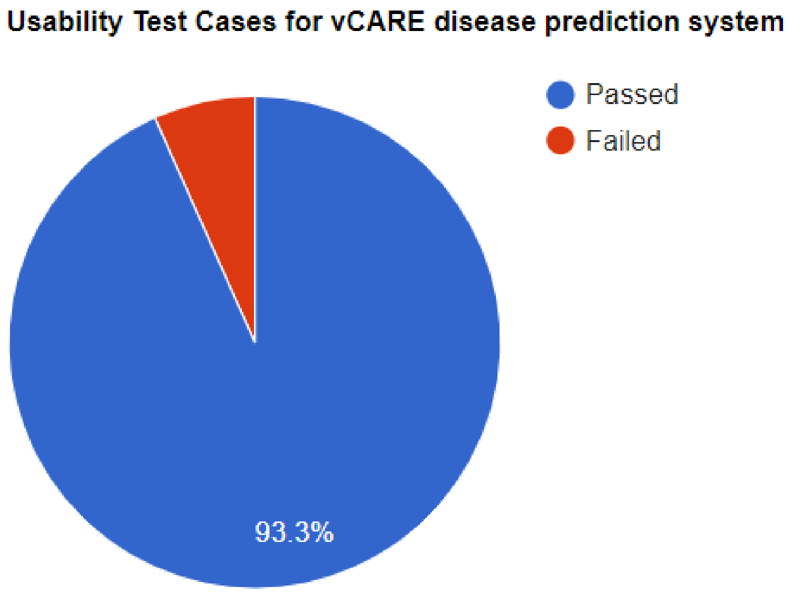
		symptoms is limited. I recommend that you allow patients to add new symptoms based on their own preferences, which will increase the flexibility of your website and allow it to be utilised by a wider range of patients.
	If you were the website developer, what would be the first thing you would do to improve the website?	If I have been given the chance of working on this website, I will like to add more data in disease knowledge base of this website so that it can be used by more number of peoples.
	Is there anything that you feel is missing on this site?	I will like to add more features and functionalities to this website. I'll try to include a video consultation between the doctor and the patient. I'll also aim to provide a tool that allows users to order medications. If the doctor prescribes medication, I'd like to be able to obtain it exclusively through my website.
	If you were to describe this site to a colleague in a sentence or two, what would you say?	It might be a "Disease Prediction Web Application" that provides exceptionally accurate predictions while being simple. It can also be termed as “Healthcare At Home” or “WeCare site”. It is mostly helpful in emergency situation, for old people and also for saving time and expenses.
	Do you have any other final comments or questions?	Yes, I would absolutely say that it is a lovely website with a lovely goal that has been well-designed. And I recommend that you all give this application to some organisation so that it can be

		used for the broader public and better serve the organization's goals. And as said earlier you can add more features like including a video consultation between the doctor and the patient and providing a tool that allows users to order medications.
18BCB0067, Parnika Rajendra-) ***18BCB0139, Observer(V Shruthiy***	What is your overall impression to this web application?	The overall application is good and the user interface is easy to navigate through. The functionality of choosing the symptoms along with severity levels as fuzzy values is one of the nice features of this web application.
	What is your impression of the search capability?	The search capability of this application is good. The main objective of this application is to predict disease .There are diseases along with their fuzzy values added to the database and the user has to simply select the fuzzy values for different symptoms and immediately the results are shown.
	Do you feel this site is current? Why?	Yes, this site is current. During this time of the pandemic its not possible to go to the doctor for every consultation. This application helps to identify disease and its severity level without much hassle .
	What did you like best about the site?	I like how the severity levels symptoms for a disease can be chosen based on fuzzy values .
	What did you like least about the site?	I think the database should cover more broad range of diseases and their associated symptoms ,so that the application can offer more

		broader range of diagnosis.
	If you were the website developer, what would be the first thing you would do to improve the website?	I would add more diseases to the database and probably provide options for uploading medical reports and add recommended medicine prescription for all diseases in the database.
	Is there anything that you feel is missing on this site? (Probe: content or site features/functions)	This application can be linked to medical store, so that based on their diagnosis they can immediately order medicines from the online medicine store.
	If you were to describe this site to a colleague in a sentence or two, what would you say?	This application is easy to use and gives accurate results about having a disease and its probability and can be considered as a self help tool .
	Do you have any other final comments or questions?	It's a good application, if the features can be improved a bit more and adjusted for a broader range of people to be able to use it would be better.
19BCE0695, Vishal R ***19BCI0232, Sahitya Madipalli***	What is your overall impression to this web application?	It was a nice experience for me, consider this ongoing pandemic, this would be a nice project to implement and was easy to use.
	What is your impression of the search capability?	Yeah I would give it a try if I think I had any kind of disease, since your application also shows the nearby doctors, it would be easier for me to go to the doctors if needed.
	Do you feel this site is current? Why?	The basic interface was pretty good for the product and was easy to understand, however, there are some places where it could have been better so to make this application a bit more easier to use such as adding sliders, etc.
	What did you like best about the site?	The best part of this website is the easiness to use and accuracy

		of predicting disease.
	What did you like least about the site?	According to me ,your website is not so secure, if one know your email id ,he can directly login .This create the chances of breaching of data.
	Is there anything that you feel is missing on this site? (Probe: content or site features/functions)	I think you can also implement the appointment booking part, with which you can directly book appointment with the doctor ,if you are not satisfied with the prediction of website
	If you were the website developer, what would be the first thing you would do to improve the website?	Maybe improve the UI colors if possible. Otherwise, it's fine
	If you were to describe this site to a colleague in a sentence or two, what would you say?	I would basically recommend this to anyone who would be sick since the self analysis part of the system is very useful for the people to get a basic idea of what they are actually suffering from. If they think that the prediction seems to be good enough, they can easily then approach the doctor if the severity is high. This would encourage people to get better healthcare.
	Do you have any other final comments or questions?	I would say it is a beautiful website with a beautiful purpose that has been well-designed. And I strongly advise that you all donate this application to a non-profit organisation so that it can be used by the general public and better serve the organization's objectives. As earlier said you can add more security to website so that it can be used by professionals

Test Cases Planned	Test Cases Executed	Test Case Passed	Test Cases Failed
75	60	56	4



Test Case	Average Time Taken
Verify whether the landing page is intuitive enough for user to get directed to their logins (doctor and patient separate)	3s
Verify whether the login page took only required necessary inputs.	3s
Verify whether the directing for the sign up process in case an account does not exists already easy	3.5s
Verify whether the sign up page took only necessary inputs to create an account.	3.5s
Verify whether the page is displayed correctly after the login with the users' own account.	3.5s
Verify whether the map shown covers the exact neighborhood areas of the user and the pointers marked at doctors are correct.	3s
Verify whether on the doctors' login, accuracy testing page displays the results correctly and clearly, thus making it easier to analyze the accuracy of any disease data.	6s
Verify whether the 'Register Here!!' page has all necessary text boxes to create account (First Name, Last Name, Email Address, and Password).	4s
Verify whether the user knows which page he/she is currently navigating through page headers like ‘select symptoms’, ‘predict disease’, etc.	3s
Verify whether Symptom, Value, and Symptom Description have right	3.5s

ranges and parameters (inclusive/exclusive).	3s
Verify whether there is a navigation flow as a basic principle of heuristic evaluation for first time users.	3.5s
Verify whether for each and every disease, there is it's respective severity, a prediction result and precaution page (HTML).	3s
Verify whether the disease knowledge base (for add disease) has disease name, specialist and precautions dialog box in working condition with features to add symptom details.	3.5s
Verify whether the fuzzy logic algorithm is consistent in it's results (output) for the same symptoms (input parameters) through a dry run	4s
Verify whether there is an option to save the details.	3s

7. IMPLEMENTATION

Team Member 1: 19BCI0232 , MADIPALLI SAHITYA

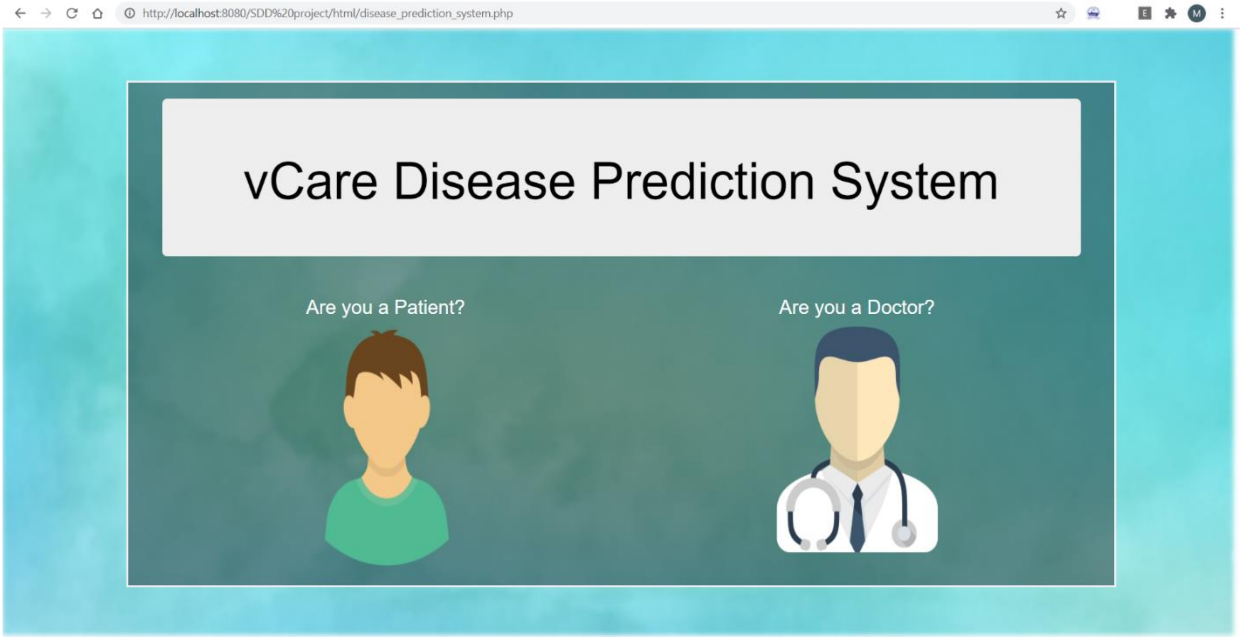
A. LANDING PAGE:

CODE:

```
<!DOCTYPE html>
<html lang="en-us">
<meta charset="utf-8" />
<head>
   <title>Disease Prediction System</title>
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
   <script src="../js/jquery.js" type="text/javascript"></script>
   <script src="../bootstrap/js/bootstrap.min.js"></script>
   <script src="../js/admin1.js" type="text/javascript"></script>
   <script src="../js/add_disease.js"  type="text/javascript"></script>
   <link rel="stylesheet" type="text/css" href="../css/basic style.css">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap.css">
</head>

<body >
<div class="bg-image">
      <img src="../img/background.jpg" class = "image">
   </div>

   <div class= "inside">
         <div class="container">
               <div class="jumbotron">
```

```
                    <h1>vCare Disease Prediction System</h1>
                </div>
            </div>
            <div class="container">
                <div class="row">
                    <div class="patient col-md-4 col-md-offset-1"><a href="patientlogin.php"><h3 style="color: white;"> Are you a Patient?</h3><img src="../img/Patient.png" class="rounded" alt="Patient" width="304" height="300"></a></div>
                    <div class="doctor col-md-4 col-md-offset-2"><a href="doctorlogin.php"><h3 style="color: white;">Are you a Doctor?</h3><img src="../img/Doctor.png" class="rounded" alt="Doctor" width="200" height="280"></a></div>
                </div>
            </div>
</div>

</body>
</html>
```

SCREENSHOT:



http://localhost:8080/SDD%20project/html/disease_prediction_system.php

vCare Disease Prediction System

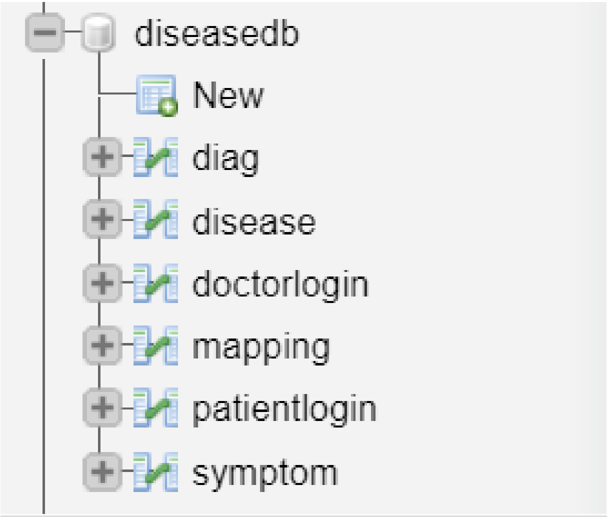
Are you a Patient?

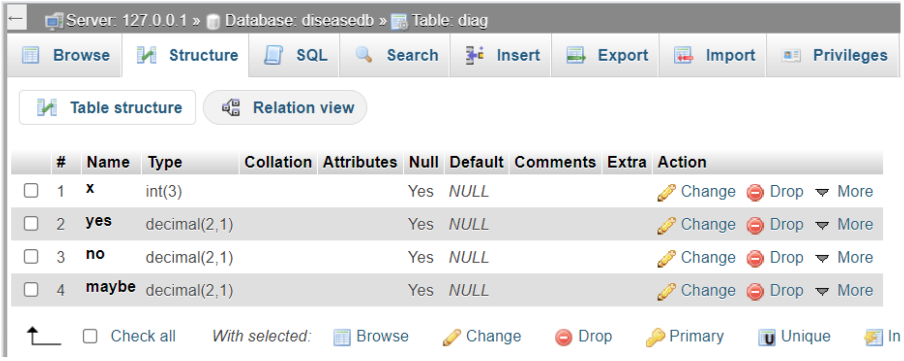
Are you a Doctor?

B. DB CONNECTION:

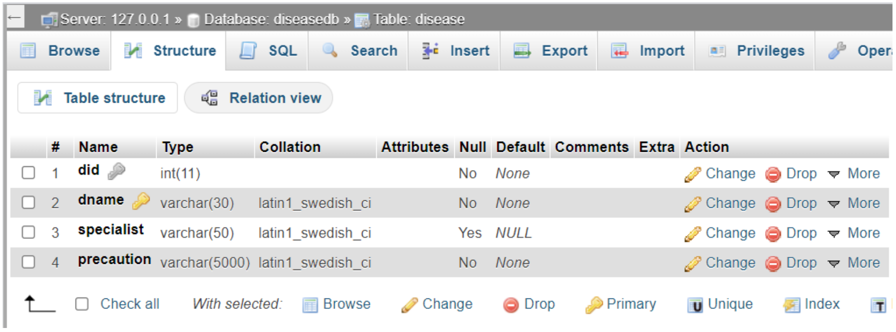
```
<?php
$con=mysqli_connect("localhost","root","","diseasedb") or die("couldn't to the  server");
?>
```

C. DATA COLLECTION & SQL TABLES:

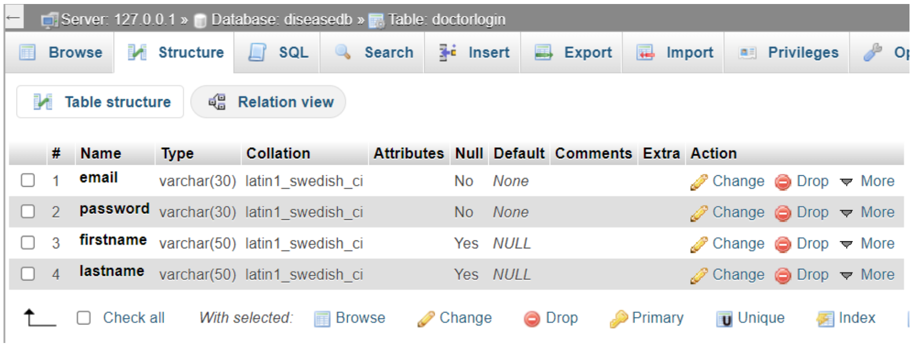




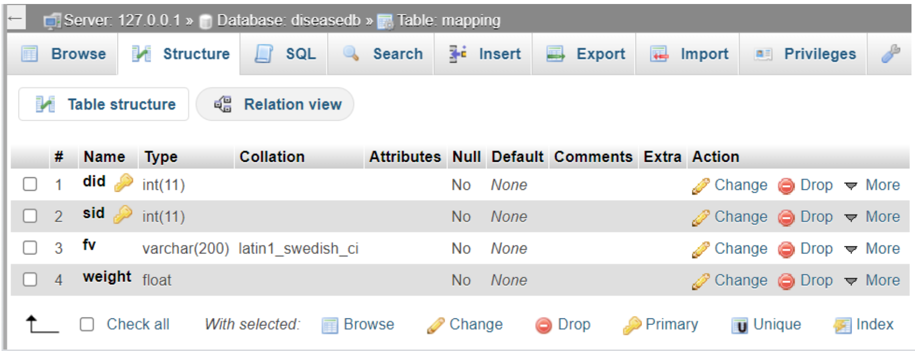
	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
□	1	**x**	int(3)			Yes	*NULL*			Change Drop More
□	2	**yes**	decimal(2,1)			Yes	*NULL*			Change Drop More
□	3	**no**	decimal(2,1)			Yes	*NULL*			Change Drop More
□	4	**maybe**	decimal(2,1)			Yes	*NULL*			Change Drop More



	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
□	1	**did**	int(11)			No	*None*			Change Drop More
□	2	**dname**	varchar(30)	latin1_swedish_ci		No	*None*			Change Drop More
□	3	**specialist**	varchar(50)	latin1_swedish_ci		Yes	*NULL*			Change Drop More
□	4	**precaution**	varchar(5000)	latin1_swedish_ci		No	*None*			Change Drop More

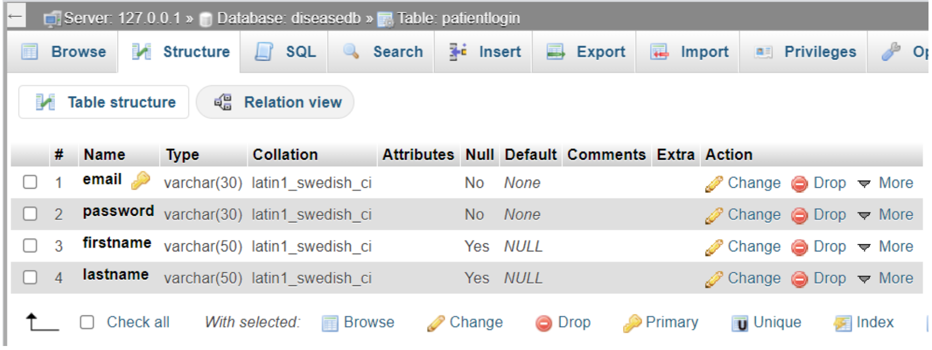


	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
□	1	**email**	varchar(30)	latin1_swedish_ci		No	*None*			Change Drop More
□	2	**password**	varchar(30)	latin1_swedish_ci		No	*None*			Change Drop More
□	3	**firstname**	varchar(50)	latin1_swedish_ci		Yes	*NULL*			Change Drop More
□	4	**lastname**	varchar(50)	latin1_swedish_ci		Yes	*NULL*			Change Drop More



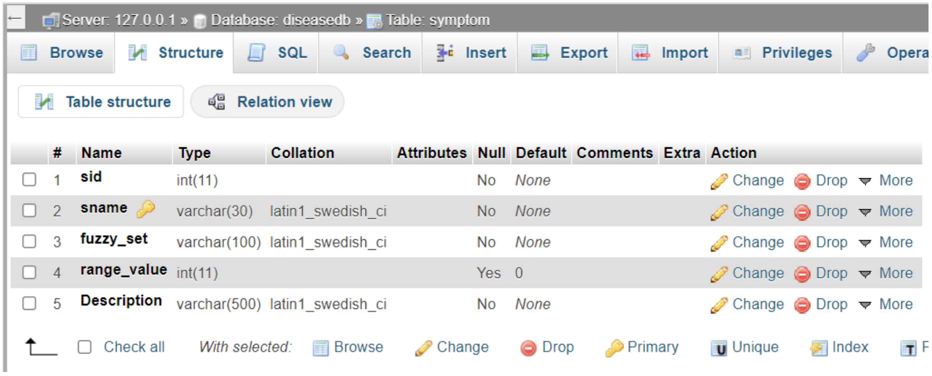
	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
□	1	did	int(11)			No	None			Change Drop More
□	2	sid	int(11)			No	None			Change Drop More
□	3	fv	varchar(200)	latin1_swedish_ci		No	None			Change Drop More
□	4	weight	float			No	None			Change Drop More

□ Check all *With selected:* Browse Change Drop Primary Unique Index



	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
□	1	email	varchar(30)	latin1_swedish_ci		No	None			Change Drop More
□	2	password	varchar(30)	latin1_swedish_ci		No	None			Change Drop More
□	3	firstname	varchar(50)	latin1_swedish_ci		Yes	NULL			Change Drop More
□	4	lastname	varchar(50)	latin1_swedish_ci		Yes	NULL			Change Drop More

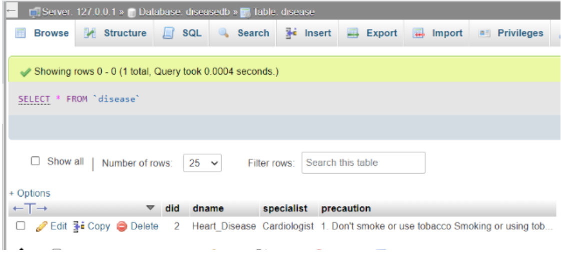
□ Check all *With selected:* Browse Change Drop Primary Unique Index



	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
□	1	sid	int(11)			No	None			Change Drop More
□	2	sname	varchar(30)	latin1_swedish_ci		No	None			Change Drop More
□	3	fuzzy_set	varchar(100)	latin1_swedish_ci		No	None			Change Drop More
□	4	range_value	int(11)			Yes	0			Change Drop More
□	5	Description	varchar(500)	latin1_swedish_ci		No	None			Change Drop More

□ Check all *With selected:* Browse Change Drop Primary Unique Index F

DATA USED: https://www.kaggle.com/sadiq2894/heart-disease-analysis-and-predicting/data?select=heart.csv

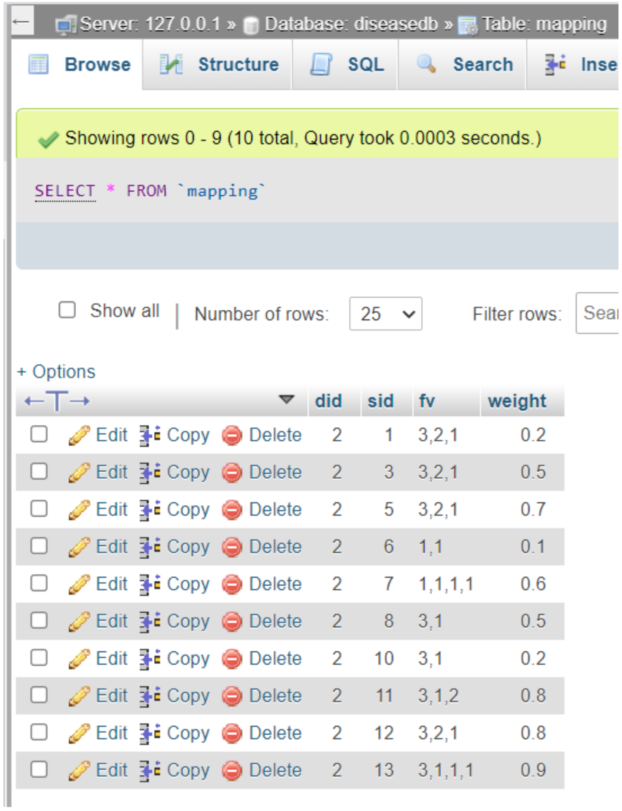


✓ Showing rows 0 - 0 (1 total, Query took 0.0004 seconds.)

```
SELECT * FROM `disease`
```

□ Show all | Number of rows: 25 Filter rows: Search this table

	did	dname	specialist	precaution
□ Edit Copy Delete	2	Heart_Disease	Cardiologist	1. Don't smoke or use tobacco Smoking or using tob...



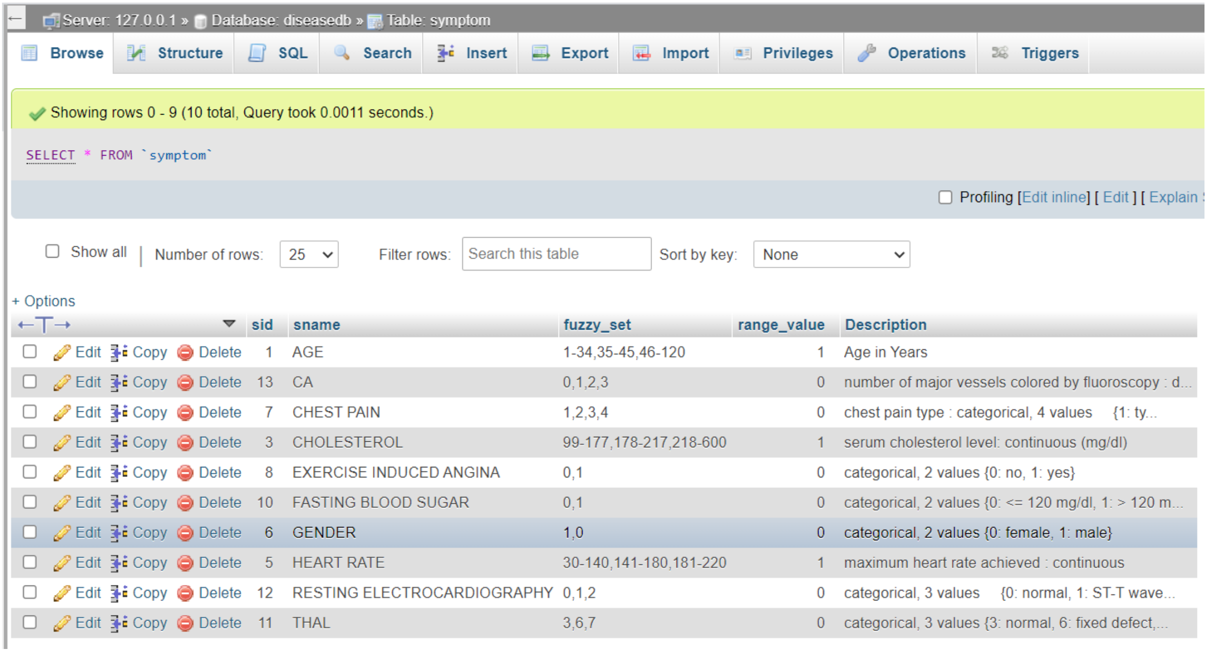
✓ Showing rows 0 - 9 (10 total, Query took 0.0003 seconds.)

```
SELECT * FROM `mapping`
```

□ Show all | Number of rows: 25 Filter rows: Sea

+ Options

←T→ ▼	did	sid	fv	weight
□ Edit Copy Delete	2	1	3,2,1	0.2
□ Edit Copy Delete	2	3	3,2,1	0.5
□ Edit Copy Delete	2	5	3,2,1	0.7
□ Edit Copy Delete	2	6	1,1	0.1
□ Edit Copy Delete	2	7	1,1,1,1	0.6
□ Edit Copy Delete	2	8	3,1	0.5
□ Edit Copy Delete	2	10	3,1	0.2
□ Edit Copy Delete	2	11	3,1,2	0.8
□ Edit Copy Delete	2	12	3,2,1	0.8
□ Edit Copy Delete	2	13	3,1,1,1	0.9



✓ Showing rows 0 - 9 (10 total, Query took 0.0011 seconds.)

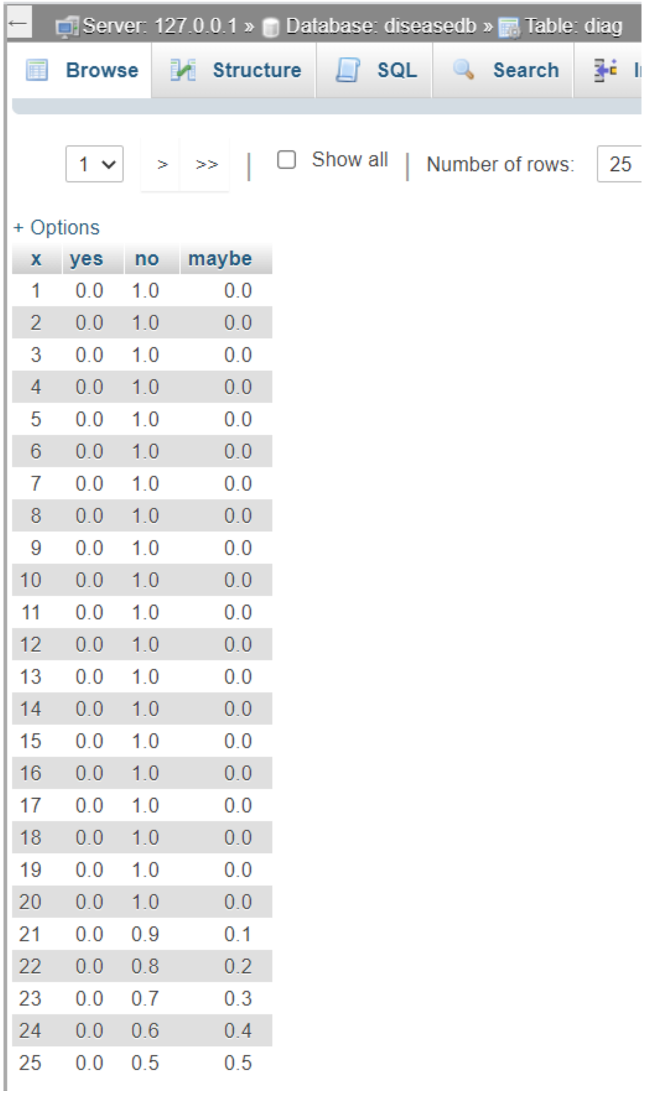
```
SELECT * FROM `symptom`
```

□ Profiling [Edit inline] [Edit] [Explain

□ Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

+ Options

←T→ ▼	sid	sname	fuzzy_set	range_value	Description
□ Edit Copy Delete	1	AGE	1-34,35-45,46-120	1	Age in Years
□ Edit Copy Delete	13	CA	0,1,2,3	0	number of major vessels colored by fluoroscopy : d...
□ Edit Copy Delete	7	CHEST PAIN	1,2,3,4	0	chest pain type : categorical, 4 values {1: ty...
□ Edit Copy Delete	3	CHOLESTEROL	99-177,178-217,218-600	1	serum cholesterol level: continuous (mg/dl)
□ Edit Copy Delete	8	EXERCISE INDUCED ANGINA	0,1	0	categorical, 2 values {0: no, 1: yes}
□ Edit Copy Delete	10	FASTING BLOOD SUGAR	0,1	0	categorical, 2 values {0: <= 120 mg/dl, 1: > 120 m...
□ Edit Copy Delete	6	GENDER	1,0	0	categorical, 2 values {0: female, 1: male}
□ Edit Copy Delete	5	HEART RATE	30-140,141-180,181-220	1	maximum heart rate achieved : continuous
□ Edit Copy Delete	12	RESTING ELECTROCARDIOGRAPHY	0,1,2	0	categorical, 3 values {0: normal, 1: ST-T wave...
□ Edit Copy Delete	11	THAL	3,6,7	0	categorical, 3 values {3: normal, 6: fixed defect,...



x	yes	no	maybe
1	0.0	1.0	0.0
2	0.0	1.0	0.0
3	0.0	1.0	0.0
4	0.0	1.0	0.0
5	0.0	1.0	0.0
6	0.0	1.0	0.0
7	0.0	1.0	0.0
8	0.0	1.0	0.0
9	0.0	1.0	0.0
10	0.0	1.0	0.0
11	0.0	1.0	0.0
12	0.0	1.0	0.0
13	0.0	1.0	0.0
14	0.0	1.0	0.0
15	0.0	1.0	0.0
16	0.0	1.0	0.0
17	0.0	1.0	0.0
18	0.0	1.0	0.0
19	0.0	1.0	0.0
20	0.0	1.0	0.0
21	0.0	0.9	0.1
22	0.0	0.8	0.2
23	0.0	0.7	0.3
24	0.0	0.6	0.4
25	0.0	0.5	0.5

Team Member 2: 19BCE2249 , SIDDHARTH CHATTERJEE

- **LOGIN & REGISTRATION FORM FOR PATIENTS:**

```
<!DOCTYPE html>
<html lang="en-us">
<meta charset="utf-8" />
<head>
   <title>Patient login</title>
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
   <script src="../js/jquery.js" type="text/javascript"></script>
   <script src="../bootstrap/js/bootstrap.min.js"></script>
   <script src="../js/admin1.js" type="text/javascript"></script>
   <script src="../js/add_disease.js"  type="text/javascript"></script>
   <link rel="stylesheet" type="text/css" href="../css/basic style.css">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap.css">
</head>
<body>
<div class="bg-image">
      <img src="../img/background.jpg" class = "image">
   </div>
   <div class= "inside">
   <div id="loginbox" style="margin-top:50px;" class="mainbox col-md-6 col-md-offset-3 col-sm-8 col-sm-offset-2">
      <div class="form">
         <h1 style="color: white">Login Here!!</h1><br>
<form id="loginform" class="form - horizontal" role="form" action="../php/patientlogin.php" method="post">
                    <input id="login-email" type="email" class="form-control" name="email" value="" placeholder="Enter your Email id" required>
                    <br>
                    <input id="login-password" type="password" class="form-control" name="password" placeholder="Enter your password" required>
                          <div style="margin-top:10px" class="form-group">
                             <div class="col-sm-12 controls">
                              <button type="submit" id="btn-login" href="#" class="btn btn-info" style ="color: white; border: 3px solid indigo; background-color: blueviolet;">Login  </button>
                             </div>
                          </div>
                          <div class="form-group">
                             <div class="col-md-12 control">
                                <div style="border-top: 3px solid black; padding-top:15px; font-size:85%" ><br>
                                   Don't have an account?
                                <a href="#" onClick="$('#loginbox').hide(); $('#signupbox').show()">
                                  <h5 style ="color: white; border: 3px solid darkgreen; padding:4px; margin-left:20%; margin-right:20%; background-color: forestgreen;"> Sign Up Here </h5>
                                </a>
                                </div>
                             </div>
                          </div>
                       </form>
                    </div>
</div>
         <div id="signupbox" style="display:none; margin-top:50px" class="mainbox col-md-6 col-md-offset-3 col-sm-8 col-sm-offset-2">
         <div class="form">
```

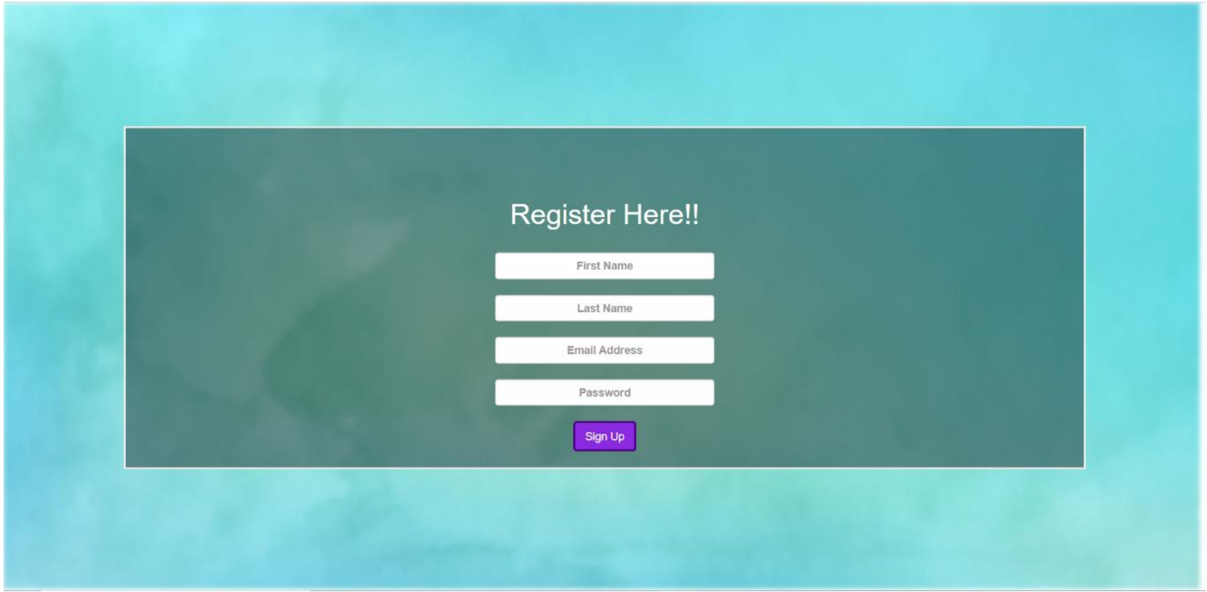
```
            <h1 style="color: white">Register Here!!</h1>
            <br>
            <form id="signupform" class="form-horizontal" role="form" action="../php/patientsignup.php" method="post">

                                    <div id="signupalert" style="display:none" class="alert alert-danger">
                                        <p>Error:</p>
                                        <span></span>
                                    </div>
                                            <input type="text" class="form-control" name="firstname" pattern="[A-Za-z]" placeholder="First Name" required>
                                            <br>
                                            <input type="text" class="form-control" name="lastname" pattern="[A-Za-z]"  placeholder="Last Name" required>
                                            <br>
                                            <input type="email" class="form-control" name="email" placeholder="Email Address" required>
                                            <br>
                                            <input type="password" class="form-control" name="password" placeholder="Password" required>
                                            <br>
                                        <div class="col-sm-12 controls">
                                            <button type="submit" id="btn-signup" type="button" class="btn btn-info" style ="color: white; border: 3px solid indigo; background-color: blueviolet;">Sign Up</button>
                                        </div>

                                </form>
                             </div>
                        </div>
</div>
</body>
</html>
```

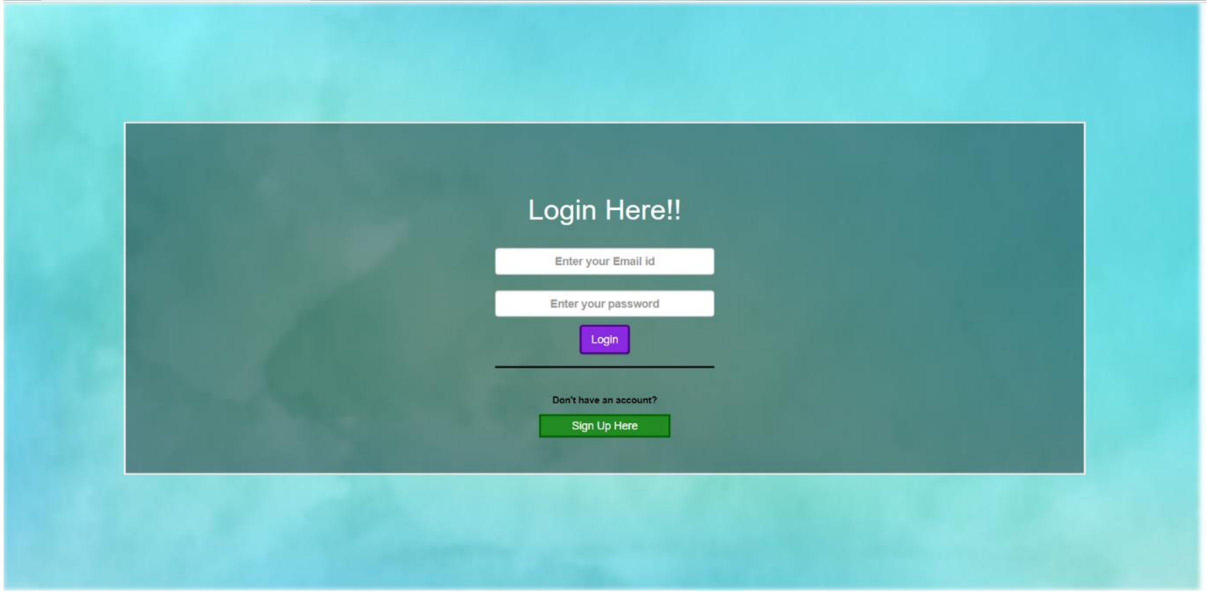
- **LOGIN & REGISTRATION FORM FOR DOCTORS:**

```
<!DOCTYPE html>
<html lang="en-us">
<meta charset="utf-8" />
<head>
    <title>Doctor login</title>
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
    <script src="../js/jquery.js" type="text/javascript"></script>
    <script src="../bootstrap/js/bootstrap.min.js"></script>
    <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
    <link rel="stylesheet" type="text/css" href="../css/basic style.css">
    <link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
    <link rel="stylesheet" href="../bootstrap/css/bootstrap.css">
</head>
<body>
<div class="bg-image">
        <img src="../img/background.jpg" class = "image">
    </div>

    <div class= "inside">
    <div id="loginbox" style="margin-top:50px;" class="mainbox col-md-6 col-md-offset-3 col-sm-8 col-sm-offset-2">
        <div class="form">
            <h1 style="color: white">Login Here!!</h1>
            <br>
            <form id="loginform" class="form-horizontal" role="form" action="../php/doctorlogin.php" method="post">
                            <input id="login-email" type="email" class="form-control" name="email" value="" placeholder="Enter your Email id" required>
                            <br>
                            <input id="login-password" type="password" class="form-control" name="password" placeholder="Enter your password" required>
                                    <div style="margin-top:10px" class="form-group">
                                        <div class="col-sm-12 controls">
                                          <button type="submit" id="btn-login" href="#" class="btn btn-info" style ="color: white; border: 3px solid indigo; background-color: blueviolet;">Login  </button>
                                        </div>
                                    </div>
                                    <div class="form-group">
                                        <div class="col-md-12 control">
                                            <div style="border-top: 3px solid black; padding-top:15px; font-size:85%" ><br>
                                                Don't have an account?
                                            <a href="#" onClick="$('#loginbox').hide(); $('#signupbox').show()">
                                               <h5 style ="color: white; border: 3px solid darkgreen; padding:4px; margin-left:20%; margin-right:20%; background-color: forestgreen;"> Sign Up Here </h5>
                                            </a>
                                            </div>
                                        </div>
                                    </div>
                                </form>
                            </div>
</div>
            <div id="signupbox" style="display:none; margin-top:50px" class="mainbox col-md-6 col-md-offset-
```

```
3 col-sm-8 col-sm-offset-2">
            <div class="form">
            <h1 style="color: white">Register Here!!</h1>
            <br>
            <form id="signupform" class="form-
horizontal" role="form" action="../php/doctorsignup.php" method="post">

                                    <div id="signupalert" style="display:none" class="alert alert-danger">
                                        <p>Error:</p>
                                        <span></span>
                                    </div>
                                            <input type="text" class="form-control" name="firstname" pattern="[A-Za-z]"
 placeholder="First Name" required>
                                            <br>
                                            <input type="text" class="form-control" name="lastname" pattern="[A-Za-z]"
  placeholder="Last Name" required>
                                            <br>
                                            <input type="email" class="form-
control" name="email" placeholder="Email Address" required>
                                            <br>
                                            <input type="password" class="form-
control" name="password" placeholder="Password" required>
                                            <br>
                                        <div class="col-sm-12 controls">
                                            <button type="submit" id="btn-signup" type="button" class="btn btn-
info" style ="color: white; border: 3px solid indigo; background-color: blueviolet;">Sign Up</button>
                                        </div>
                                </form>
                            </div>
                        </div>
</div>
</body>
</html>
```

SCREENSHOTS:





The Same UI has been used for the doctor’s login. The data storing is changed.

Team Member 3: 18BCB0027 , ABHISHEK MISHRA

A. Patient Symptoms User form

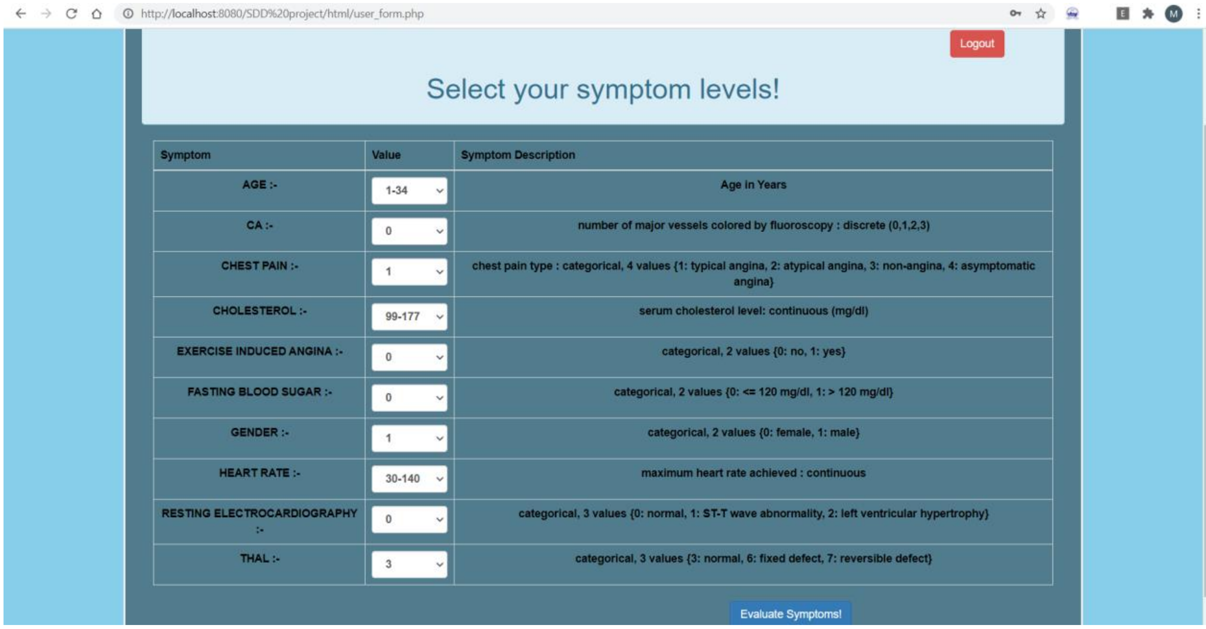
```
<!DOCTYPE html>
<html lang="en-us">
<meta charset="utf-8" />
<head>
   <title>User Form</title>
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
   <script src="../js/jquery.js" type="text/javascript"></script>
```

```
    <script src="../bootstrap/js/bootstrap.min.js"></script>
    <script src="../js/user_form.js"  type="text/javascript"></script>
    <link rel="stylesheet" type="text/css" href="../css/basic style.css">
    <link rel="stylesheet" type="text/css" href="../css/add_disease.css">
    <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">

</head>

<body style="background-color: skyblue;">

<div class= "inside2">
                <div class="alert alert-info">
                        <?php session_start(); ?>
                        <?php echo "Hello, ".$_SESSION['pemail']; ?>
                        <?php if(!isset($_SESSION['pemail'])) header('location:disease_prediction_system.php'); ?>
                        <a class=" btn btn-danger col-md-offset-10" href="../php/logout.php" >Logout</a>
            <h1>Select your symptom levels!</h1>
                </div>


        <div class="container ">
        <div id="add_here">
        </div>
    </div>

    <div class="container">
        <div class="vertical-gap">
                <button class="btn btn-default btn-primary col-sm-offset-
5" onclick="make_string()">Evaluate Symptoms!</button>

        </div>
    </div>
</div>
</body>

</html>
```

Javascript part:

```
$(document).ready(function(){
    ajax_call();
});
var symptom_description = [];

function ajax_call(str)
```

```
{
  $.ajax({
      url   : "../php/symptom_description.php",
      type  : "POST",
      async : false,
      data  : {

              },
      success: function(data)
      {
          //alert(data);
          //console.log(data);
          symptom_description = data.split('|');
          //console.log(symptom_description);
          // for(var i=0; i<11; i++){
          //     console.log(tmp[i]);
          //     symptom_description.push(tmp[i]);
          // }
      }
  });

    $.ajax({
        url   : "../php/user_form.php",
        type  : "POST",
        async : false,
        data  : {

                },
        success: function(data)
        {
            //alert(data);
            make_array(data);
        }
    });


}

var sname = [];
var fv = [];

function make_array(str)
{
    var ar = str.split('|');
    for (var i = 0; i < ar.length; i++) {
        var ind = ar[i].indexOf(',');
        sname[i] = ar[i].substring(0,ind);
        fv[i] = ar[i].substring(ind+1,ar[i].length).split(',');
        //alert(sname[i]+" "+fv[i]);
    }
    show();
}

function show()
{
    //console.log(fv.length);
    var tb1 = '<div class=""><table class="table table-responsive table-bordered "><thead><tr><th>Symptom </th><th>Value</th><th>Symptom Description</th></tr></thead><tbody>';
    var tb2 = '</tbody></table></div>';
    for (var i = 0; i < sname.length; i++) {
        var box = '<tr><td class = "sname">'+sname[i]+' :- </td>';
        box = box +'<td><select class=" form-control" id="s'+i+'">'+(i+1)+' '+sname[i];

        for (var j = 0; j < fv[i].length; j++) {
            var t = '<option value="'+fv[i][j]+'">'+fv[i][j]+'</option>';
            box += t;
        }

        box+='</select></td>';

        box += '<td>'+ symptom_description[i] +'</td></tr>';
        tb1 = tb1+box;
    }
    $("#add_here").append(tb1+tb2);
}

var json;
function make_string()
{

    var str = '';
    for (var i = 0; i < sname.length; i++) {
        str = str +sname[i]+','+$("#s"+i).val();
        if(sname.length-1!=i)
            str += '|';
    }
    console.log(str);
    //send this data to evaluate
    //alert(str);
    $.ajax({
        url   : "../php/evaluate.php",
        type  : "POST",
        async : false,
        dataType : "json",
        data  : {
                  "str" : str ,
                },
        success: function(data)
        {
            //alert(data);
            // var queryString = "?" + JSON.stringify(data);
            // window.location.href = "result.html" + queryString;
            //alert(data);
            json = (data);
            //alert(JSON.parse(json));
            w = window.open("../html/result.php", "Result");
        }
    });
}


function accuracy()
{

}

function getJSON(){
        return json;
}
```



Select your symptom levels!

Symptom	Value	Symptom Description
AGE :-	1-34	Age in Years
CA :-	0	number of major vessels colored by fluoroscopy : discrete (0,1,2,3)
CHEST PAIN :-	1	chest pain type : categorical, 4 values {1: typical angina, 2: atypical angina, 3: non-angina, 4: asymptomatic angina}
CHOLESTEROL :-	99-177	serum cholesterol level: continuous (mg/dl)
EXERCISE INDUCED ANGINA :-	0	categorical, 2 values {0: no, 1: yes}
FASTING BLOOD SUGAR :-	0	categorical, 2 values {0: <= 120 mg/dl, 1: > 120 mg/dl}
GENDER :-	1	categorical, 2 values {0: female, 1: male}
HEART RATE :-	30-140	maximum heart rate achieved : continuous
RESTING ELECTROCARDIOGRAPHY :-	0	categorical, 3 values {0: normal, 1: ST-T wave abnormality, 2: left ventricular hypertrophy}
THAL :-	3	categorical, 3 values {3: normal, 6: fixed defect, 7: reversible defect}

6. Results display with disease severity prediction

CODE:

```
<!DOCTYPE html>
<html lang="en-us">
<meta charset="utf-8" />
<head>
   <title>Result</title>
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
   <script src="../js/jquery.js" type="text/javascript"></script>
   <script src="../bootstrap/js/bootstrap.min.js"></script>
   <script src="../js/result.js" type="text/javascript"></script>
   <link rel="stylesheet" type="text/css" href="../css/basic style.css">
   <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">

</head>

<body style="background-color: skyblue;">
<br><br>
   <div class="container alert alert-info ">
      <?php session_start(); ?>
      <?php echo "Hello, ".$_SESSION['pemail']; ?>
      <?php if(!isset($_SESSION['pemail'])) header('location:disease_prediction_system.php'); ?>
      <a class=" btn btn-danger col-md-offset-10" href="../php/logout.php" >Logout</a>
      <br>
      <div id="result" class="container   ">
      </div>
   </div>
```

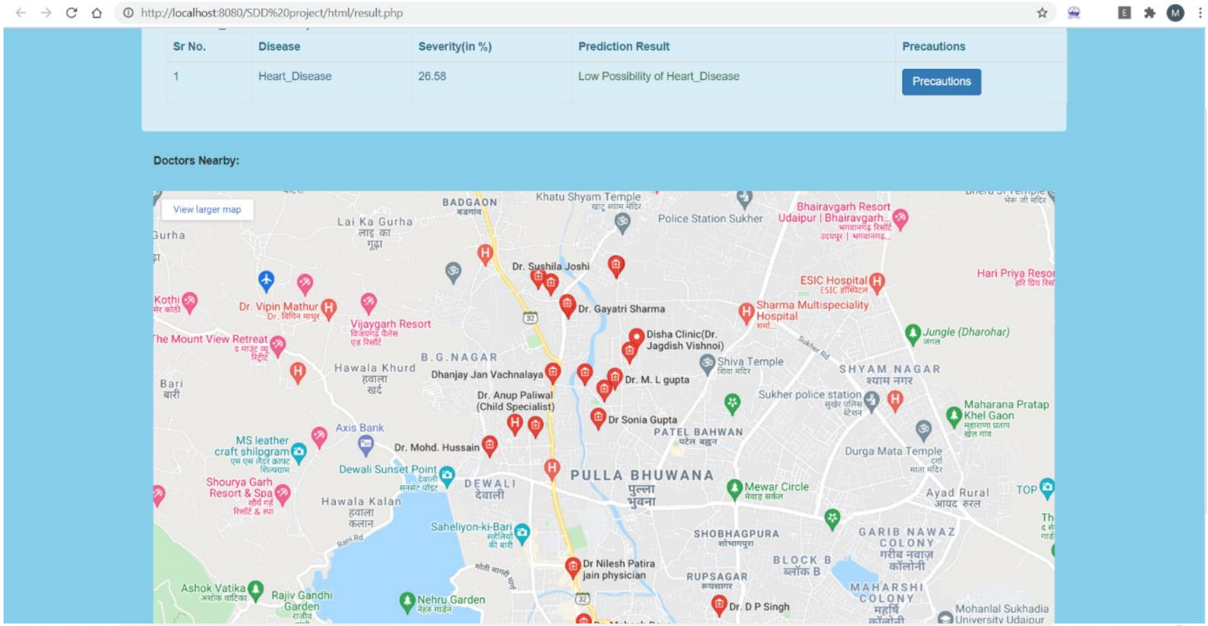
```
    <div class="container">
            <div id="map" style ="height:750px;"><h5><b>Doctors Nearby: <b></h5><br><iframe width="100%" height="90%" style="border:0" loading="lazy" allowfullscreen src="https://www.google.com/maps/embed/v1/search?q=doctors%20near%20me&key=AIzaSyBhKby_bqftsSOZnHM3H0DBor_I1iJlFpY"></iframe></div>
            <div id="precaution" style="margin-top: 30px"></div>
    </div>
</body>

</html>
```

Javascript part:

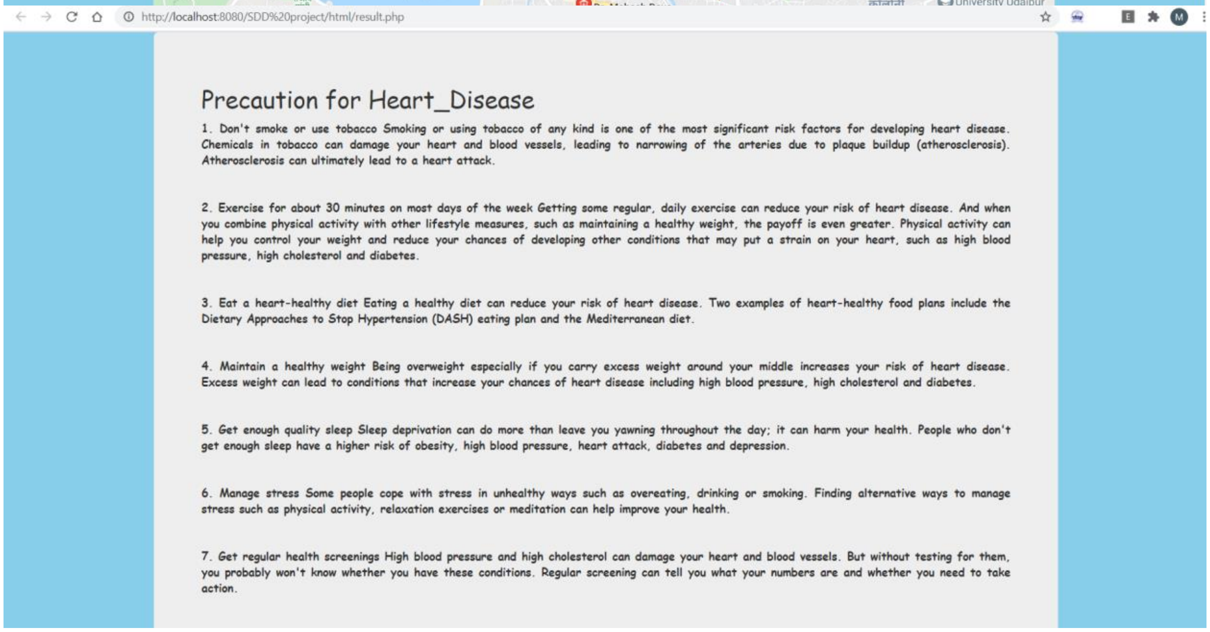
```
 //alert(window.opener.getJSON());
$(document).ready(function(){

    var json = window.opener.getJSON();
    var len = Object.keys(json).length;
    var i = 1;
    var str = '';

    var tuple1 = '<td><button class="btn btn-primary" onclick="precaution(this)"  id="';
    var tuple2 = '">Precautions</button></td>"  id="';

    var tb1 = '<div class="vertical-gap"><table class="table table-responsive table-bordered "><thead><tr><th>Sr No. </th><th>Disease</th><th>Severity(in %)</th><th>Prediction Result</th><th>Precautions</th></tr></thead><tbody>';
    var tb2 = '</tbody></table></div>';
    for(key in json){

        str += '<tr><td>'+i+'</td>'+'<td>'+key+'</td>'+'<td>'+json[key].toFixed(2)+'</td>';
        var danger = '<td class="text-danger">High Possibility of '+key+'</td>';
        var normal = '<td class="text-success">Low Possibility of '+key+'</td>';
        if(json[key] > 50)
            str += danger;
        else
            str += normal;

        str += tuple1+key+tuple2+key+'">Nearby Doctors</button></td></tr>';
        i++;
    }
    $('#result').append(tb1+str+tb2);
 });
```

```
var map;
var infowindow;
var geolocate;
var specialist = '';

function precaution(e)
{
    $.ajax
    ({
            url : "../php/map.php",
            type : "POST",
            data : {
                "disease" : e.id,
                "type" : 0
            },
            success : function(data){
                $('#precaution').html('<div id ="prec1" class="jumbotron text-justify" style="font-family:Comic Sans MS, cursive, sans-serif">');
                $('#prec1').html('<h2>Precaution for '+e.id+' </h2>'+data+'</div>');
                $('html, body').animate({
                    scrollTop: $("#prec1").offset().top
                }, 3000);
            },
            error : function(err)
            {
                alert('error in ajax');
            }
    });

}
```

SCREENSHOT:



Sr No.	Disease	Severity(in %)	Prediction Result	Precautions
1	Heart_Disease	26.58	Low Possibility of Heart_Disease	Precautions



Precaution for Heart_Disease

1. Don't smoke or use tobacco Smoking or using tobacco of any kind is one of the most significant risk factors for developing heart disease. Chemicals in tobacco can damage your heart and blood vessels, leading to narrowing of the arteries due to plaque buildup (atherosclerosis). Atherosclerosis can ultimately lead to a heart attack.

2. Exercise for about 30 minutes on most days of the week Getting some regular, daily exercise can reduce your risk of heart disease. And when you combine physical activity with other lifestyle measures, such as maintaining a healthy weight, the payoff is even greater. Physical activity can help you control your weight and reduce your chances of developing other conditions that may put a strain on your heart, such as high blood pressure, high cholesterol and diabetes.

3. Eat a heart-healthy diet Eating a healthy diet can reduce your risk of heart disease. Two examples of heart-healthy food plans include the Dietary Approaches to Stop Hypertension (DASH) eating plan and the Mediterranean diet.

4. Maintain a healthy weight Being overweight especially if you carry excess weight around your middle increases your risk of heart disease. Excess weight can lead to conditions that increase your chances of heart disease including high blood pressure, high cholesterol and diabetes.

5. Get enough quality sleep Sleep deprivation can do more than leave you yawning throughout the day; it can harm your health. People who don't get enough sleep have a higher risk of obesity, high blood pressure, heart attack, diabetes and depression.

6. Manage stress Some people cope with stress in unhealthy ways such as overeating, drinking or smoking. Finding alternative ways to manage stress such as physical activity, relaxation exercises or meditation can help improve your health.

7. Get regular health screenings High blood pressure and high cholesterol can damage your heart and blood vessels. But without testing for them, you probably won't know whether you have these conditions. Regular screening can tell you what your numbers are and whether you need to take action.

Team Member 4: 18BCB0087 , MAITREYEE PALIWAL

- **Doctor’s Page after login:**

```
<!DOCTYPE html>
<html lang="en-us">
<meta charset="utf-8" />
<head>
   <title>Add Disease</title>
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
```

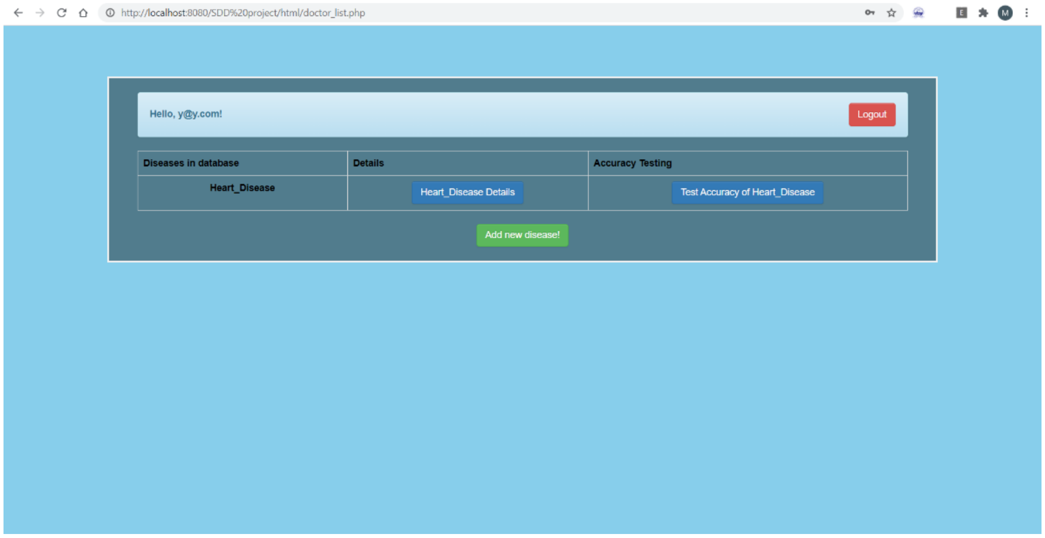
```
 <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
 <script src="../js/jquery.js" type="text/javascript"></script>
 <script src="../bootstrap/js/bootstrap.min.js"></script>
 <link rel="stylesheet" type="text/css" href="../css/basic style.css">
 <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
 <link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
 <link rel="stylesheet" href="../bootstrap/css/bootstrap.css">
<script type="text/javascript">

   var no=0;
   $(document).ready(function(){
     ajax_call();
   });
   function ajax_call(str)
   {
     $.ajax({
       url   : "../php/doctor_list.php",
       type  : "POST",
       async : false,
       data  : {

           },
       success: function(data)
       {
         console.log(data);
         $('#add_here').append(data);
       }
     });
   }

   function disease_info(str)
   {
     $.ajax({
       url   : "../php/disease_info.php",
       type  : "POST",
       async : false,
       data  : {
             "disease":str,
           },
       success: function(data)
       {
         format(data);
       }
     });
```

```
    }

    function disease_data(e)
    {
            disease_info(e.id);
    }

    function format(str)
    {
            var row = '';
            var fi = '';
            var a = str.split('/');
            for(var i=0;i<a.length-1;i++)
            {
                row = a[i].split('|');
                fi += f3(i ,row);

            }
            $('#disease_info').html(fi);
            $('html, body').animate({
                 scrollTop: $("#disease_info").offset().top
            }, 2000);
    }

    function f3(ind , rows)
    {

        var eff = ["Yes" , "Maybe" , "No"];
        var name = '<div class=" vertical-gap sym_header"><h2>'+(ind+1)+'. '+rows[2]+'</h2><h5> Weight of the symptom '+rows[2] + ' = ' +(rows[3])+'</h5></div>';
        var tuple1 = '<td><input type="text" class="form-control" disabled value="'
        var tuple2 = '"></td><td><input class="form-control" disabled name="cars"  value="'

        var tb1 = '<div class="vertical-gap"><table class="table table-responsive table-bordered table-hover"><thead><tr><th>Sr No. </th><th>Fuzzy Values</th><th>Effect</th></tr></thead><tbody>';
        var tb2 = '</tbody></table></div>';

        var fuzzy = rows[4].split(',');

        var effect = rows[6].split(',');
        var s = '';
        for(var i=0; i<fuzzy.length;i++)
        {
                s += '<tr><td>'+(parseInt(i)+1)+'</td>'+tuple1 + fuzzy[i]  + tuple2 + eff[parseInt(effect[i])-
1]+'"></td></tr>';
            }
            var tp = (name+tb1+s+tb2);
            return tp;
        }

  </script>
</head>
<body style="background-color: skyblue;">

    <div class= "inside2">
    <div class="container" id="add_here">
                <div class="alert alert-info">
                        <?php session_start(); ?>
                        <?php echo "Hello, ".$_SESSION['demail']. "!" ?>
                        <?php if(!isset($_SESSION['demail'])) header('location:disease_prediction_system.php'); ?>
                        <a class=" btn btn-danger col-md-offset-10" href="../php/logout.php" >Logout</a>
                        <br>
                </div>
      </div>

      <div class="container"><a href="add_disease.php" class="btn btn-success">Add new disease!</a></div>

            <div class="container" id="disease_info">

      </div>
    </div>

</body>

</html>
```

```
<?php

  require "dp.php";

  $all_disease = array_of_disease($con);

  function array_of_disease($con)
  {
        $i = 1;
        $output = '<div><table class="table  table-bordered  ">
```

```
            <tr>
                <th >Diseases in database</th>
                <th >Details</th>
                <th >Accuracy Testing</th>
            </tr>';

      $q1 = "Select * from disease";
      $res = mysqli_query($con,$q1);

      while($row = $res->fetch_array())
      {
         $id = $row['did'];
         $output .= '<tr><td id='.$row['dname'].'>'.$row['dname'].'</td>
         <td><button class="btn btn-
primary" onclick="disease_data(this)" id='.$row['dname'].'>'.$row['dname'].' Details</button></td>
         <td> <a class="btn btn-
primary" href="csv_read.php?disease='.$row['dname'].'" id='.$row['dname'].'> Test Accuracy of '.$row['dname'].'</a
></td>';
         $i += 1;
      }
      echo $output;
  }
```

SCREENSHOT:

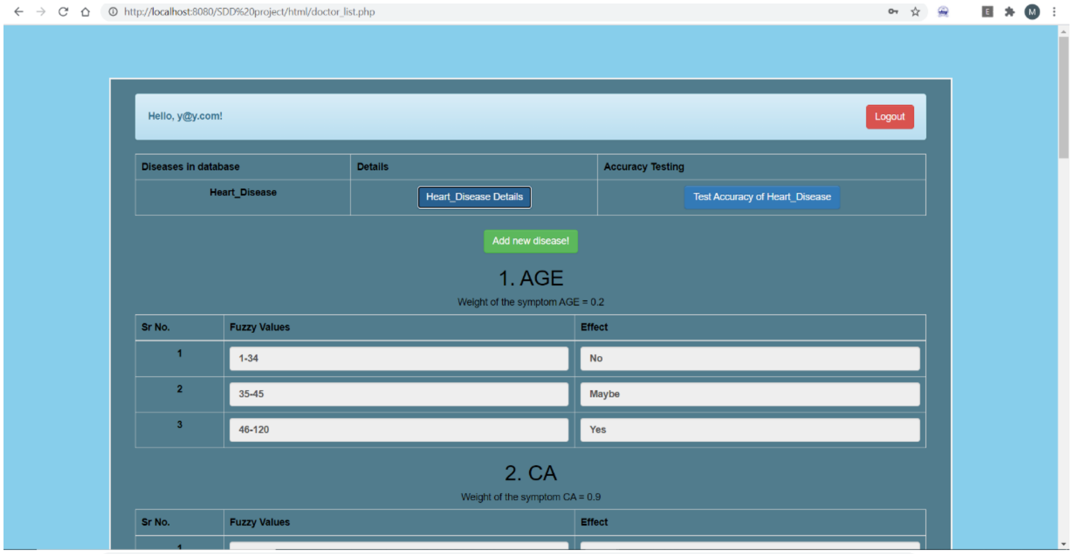


http://localhost:8080/SDD%20project/html/doctor_list.php

Hello, y@y.com!

Diseases in database	Details	Accuracy Testing
Heart_Disease	Heart_Disease Details	Test Accuracy of Heart_Disease

Clicking on Heart Disease Details:


http://localhost:8080/SDD%20project/html/doctor_list.php
Logout
Heart_Disease Details
Test Accuracy of Heart_Disease
Add new disease!

Hello, y@y.com!

Diseases in database	Details	Accuracy Testing
Heart_Disease	Heart_Disease Details	Test Accuracy of Heart_Disease

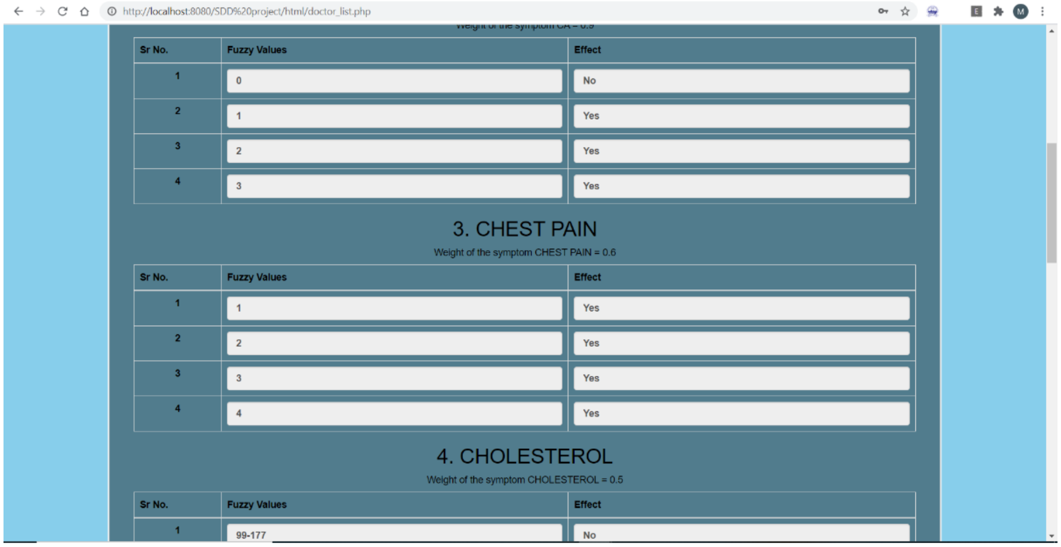
1. AGE

Weight of the symptom AGE = 0.2

Sr No.	Fuzzy Values	Effect
1	1-34	No
2	35-45	Maybe
3	46-120	Yes

2. CA

Weight of the symptom CA = 0.9



Sr No.	Fuzzy Values	Effect
1	0	No
2	1	Yes
3	2	Yes
4	3	Yes

3. CHEST PAIN

Weight of the symptom CHEST PAIN = 0.6

Sr No.	Fuzzy Values	Effect
1	1	Yes
2	2	Yes
3	3	Yes
4	4	Yes

4. CHOLESTEROL

Weight of the symptom CHOLESTEROL = 0.5

Sr No.	Fuzzy Values	Effect
1	99-177	No

And so on..

- **ADD DISEASE TO DATABASE**

```
<?php

 require "dp.php";
 $precaution = $_POST['precaution'];
 $specialist = $_POST['specialist'];


 $ar = explode('?',$_POST['str']);

 $dname = strtoupper($ar[0]);
 $did = insertdis($dname,$con, $precaution, $specialist);
 for ($i=1 ; $i<sizeof($ar) ; $i++)
 {
   $sym = explode('/',$ar[$i]);
   $sname = strtoupper($sym[0]);
   $wt = $sym[1];
   $fv = explode('|',$sym[2]);
   $des = $sym[3];
   $range_value = $sym[4];
   $sid = checksym($sname,$con);

   if($sid==-1)
    $sid = insert_in_symptoms($sname,$fv[0],$con,$range_value,$des);

   insert_in_mappings($did,$sid,$fv[1],$wt,$con);
 }
 function insertdis($str,$con,  $precaution, $specialist )
 {
  $q1 = "Select * from disease where dname='".$str."'";
  $res = mysqli_query($con,$q1);
  $no = mysqli_num_rows($res);

  if($no==1){
    while($row = $res->fetch_array())
    {
     return $row['did'];
    }
  }

  $q1 = "Select max(did) as max from disease";
  $res = mysqli_query($con,$q1);
  $no = 0;
  while($row = $res->fetch_array())
  {
   $no = $row['max'] + 1;
  }
  $query = "Insert into disease (did , dname, specialist, precaution) values('".$no."','".$str."', '".$specialist."', '".
$precaution."')";
  $res = mysqli_query($con,$query);
  return $no;
 }

 function checksym($sname,$con)
 {
  $q1 = "Select * from symptom where sname='".$sname."'";
```

```
   $res = mysqli_query($con,$q1);
   $no = mysqli_num_rows($res);

   if($no==0)
     return -1;

   while($row = $res->fetch_array())
   {
     return $row['sid'];
   }
  }

  function insert_in_symptoms($sname,$fv,$con, $range_value, $des)
  {
   $q1 = "Select * from symptom";
   $res = mysqli_query($con,$q1);
   $no = mysqli_num_rows($res)+1;
   $query = "Insert into symptom (sid , sname , fuzzy_set , range_value , Description) values('".$no."','".$sname."','".$fv."','".$range_value."','".$des."')";
   $res = mysqli_query($con,$query);
   return $no;
  }

  function insert_in_mappings($did,$sid,$fv,$wt,$con)
  {
    $query = "Insert into mapping values('".$did."','".$sid."','".$fv."','".$wt."')";
    $res = mysqli_query($con,$query);
  }

 ?>
```

JavaScript Part:

```
var no=0;
var srow = []
var snames=[]
var sw=[]
var sstrings=[]
var fv_ar=[];
var in_db;
var max = 0;
var dis = $('#dis').val();
var precaution, specialist;
var check_ar = [];
var dis_ar = [];
//alert(precaution+"  "+specialist);
//appends a symptom form just before .add_sym

$().ready(function(){
   $("#modal_button").hide();
});
function checkBoxClick()
{
        rows = $('#no').val();
        sname = $('#sname').val();
        w = $('#weight').val();


        if(!$('#dname').val().replace(/ /g,''))
        {
           alert("Please fill disease name first");
           return 1;
        }

        if(!$('#specialist').val().replace(/ /g,''))
        {
           alert("Please fill specialist first");
           return 1;
        }


        if(!$('#precaution').val().replace(/ /g,''))
        {
           alert("Please fill precaution first");
           return 1;
        }


        if(!rows || !w || !sname)
        {
           alert("Please fill all the symptom fields first!");
           return 1;
        }

        precaution = $('#precaution').val();
        specialist = $('#specialist').val();

        check_sym(sname);
        if(in_db)
           rows = fv_ar.length;

        max = rows;

        f3_checkbox(sname , rows);
        snames.push(sname);
        sw.push(w);
        srow.push(rows);

        if(in_db==true)
            make_disabled_checkbox();

}

function update_start_of_next_range(e)
{
    var cur_id = e.id, next_id = '';
    var third = 1+parseInt(cur_id.charAt(3));

    if(third-1 == max)
           return;

    next_id = setCharAt(cur_id , 3 , third.toString());
    cur_id = '#'+cur_id+'';
    next_id = '#'+next_id+'';
    if(isInt(parseFloat($(cur_id).val())))
        $(next_id).val((parseInt($(cur_id).val())+1));
    else
        $(next_id).val((parseFloat($(cur_id).val())+0.01));
    $(next_id).prop("disabled",true);

}

function setCharAt(str,index,chr) {
   if(index > str.length-1) return str;
   return str.substr(0,index) + chr + "_1";
}

function isInt(n){
   return Number(n) === n && n % 1 === 0;
}

function isFloat(n){
   return Number(n) === n && n % 1 !== 0;
```

```
}
function f3_checkbox(sname , rows)
{
        var name = '<div class=" vertical-gap sym_header"><h2>'+(no+1)+'. '+sname+'</h2><input class="form-control" placeholder="Description" id="des'+no+'"></div>';
        var tuple1 = '<td><input type="text" class="form-control" id="'
        var tuple22 = '"></td><td><input type="text" onchange="update_start_of_next_range(this)" class="form-control" id="'
        var tuple2 = '"></td><td><select class="form-control" name="cars" id="'
        var tuple3 = '"><option value="1">Yes</option><option value="2">May Be</option><option value="3">No</option></select></td>'
        var tb1 = '<div class=" vertical-gap"><table class="table table-responsive table-bordered table-hover"><thead><tr><th>Sr No.</th><th>MIN_VALUE OF Range</th><th>MAX_VALUE OF Range</th><th>Effect</th></tr></thead><tbody>';
        var tb2 = '</tbody></table></div>';
        var s = "";
        for (var i=1;i<=rows;i++)
        {
          s += '<tr><td>'+i+'</td>'+tuple1+'s'+no+'_'+i+'_1'+tuple22+'s'+no+'_'+i+'_2'+tuple2+'s'+no+'-'+i+tuple3+'</tr>';
        }

        $('#add_here').append(name+tb1+s+tb2);
        no++;
}

function make_disabled_checkbox()
{
  var ind = no-1;
  for(var i=1;i<=srow[ind];i++)
  {
    var id1 = '#s'+ind+'_'+i+"_"+1;
    var id2 = '#s'+ind+'_'+i+"_"+2;
    $(id1).prop("disabled", true );
    $(id2).prop("disabled", true );
    //alert(fv_ar[i-1]);
    var range = fv_ar[i-1];
    //console.log(range);
    var split = range.split('-');
    $(id1).val(split[0]);
    $(id2).val(split[1]);

  }
```

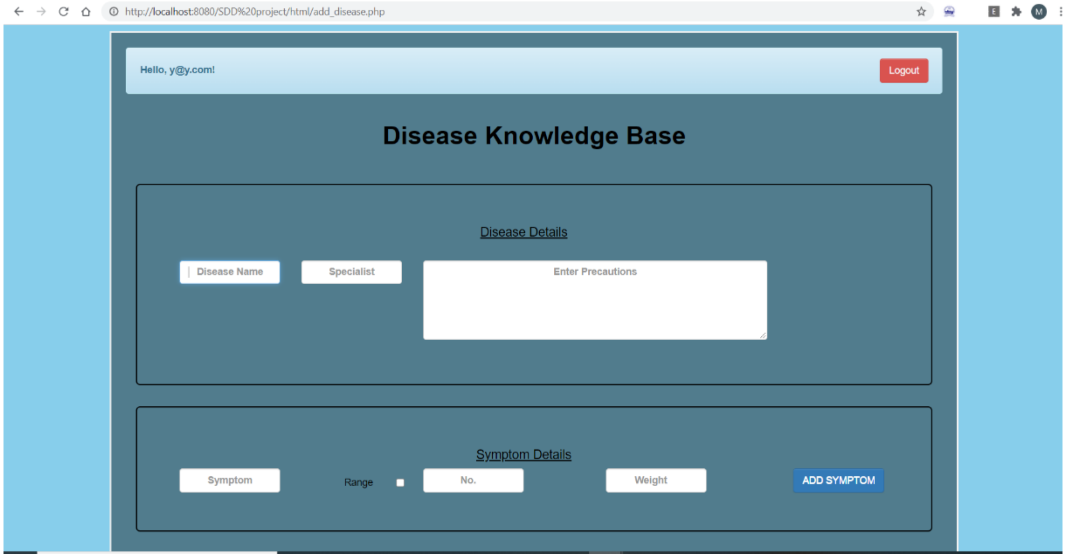
```
}

function f2()
{

        if ( !$('#mycheck').is(":checked") )
        {
                check_ar[no] = 0;
                rows = $('#no').val();
                sname = $('#sname').val();
                w = $('#weight').val();

                if(!$('#dname').val().replace(/ /g,''))
                {
                    alert("Please fill disease name first");
                    return 1;
                }

                if(!$('#specialist').val().replace(/ /g,''))
                {
                    alert("Please fill specialist first");
                    return 1;
                }


                if(!$('#precaution').val().replace(/ /g,''))
                {
                    alert("Please fill precaution first");
                    return 1;
                }

                precaution = $('#precaution').val();
                specialist = $('#specialist').val();

                if(!rows || !w || !sname)
                {
                    alert("Please fill all the symptom fields first!");
                    return 1;
                }

                //check if sname already exist or not, if so then
                //then bring the values of it!
                check_sym(sname);

                //If symptom already in db, count of fuzzy values same as before!
                if(in_db==true)
                    rows = fv_ar.length;

                //store name,weight and count of fuzzy values in array to be sent later!
                snames.push(sname);
                sw.push(w);
                srow.push(rows);

                //Make input table
                f3(sname,rows);

                if(in_db==true)
                    make_disabled();


        }
        else {
                check_ar[no] = 1;
                checkBoxClick();
        }

        $('#no').val('');
        $('#sname').val('');
        $('#weight').val('');


        $('html, body').animate({
             scrollTop: $("#save").offset().top
        }, 2000);

}

//builds the table
function f3(sname,rows)
{
  var name = '<div class=" vertical-gap sym_header"><h2>'+(no+1)+'. '+sname+'</h2> <input class="form-control" placeholder="Description" id="des'+no+'"></div>';

  var tuple1 = '<td><input type="text" class="form-control" id="'
  var tuple2 = '"></td><td><select class="form-control" name="cars" id="'
  var tuple3 = '"><option value="1">Yes</option><option value="2">May Be</option><option value="3">No</option></select></td>'
  var tb1 = '<div class=" vertical-gap"><table class="table table-responsive table-bordered table-hover"><thead><tr><th>Sr No.</th><th>Fuzzy Values</th><th>Effect</th></tr></thead><tbody>';
  var tb2 = '</tbody></table></div>';
```

```
    var s = "";
    for (var i=1;i<=rows;i++)
    {
        s += '<tr><td>'+i+'</td>'+tuple1+'s'+no+'_'+i+tuple2+'s'+no+'-'+i+tuple3+'</tr>';
    }

    $('#add_here').append(name+tb1+s+tb2);
    no++;
}

//when save button is clicked, it validates the fields and  sends data to database
function send_data()
{
    //validate();
    for(var i=0; i<no; i++)
    {
        rows = srow[i];
        sname = snames[i];
        w = sw[i];

        if(!rows || !w || !sname)
        {
            alert("Please fill all the symptom fields first!");
            return 1;
        }

    }

    if(!$('#dname').val().replace(/ /g,''))
    {
        alert("Please fill disease name first");
        return 1;
    }

    if(!$('#specialist').val().replace(/ /g,''))
    {
        alert("Please fill specialist first");
        return 1;
    }

    if(!$('#precaution').val().replace(/ /g,''))
    {
        alert("Please fill precaution first");
        return 1;
    }
    data_in_string();
}

//converts data to be stored in below format
//old
// TB ? COUGH/4/L,1|M,1|H,1 ? BP/5/L,1|M,1|H,1
//changed to this format now
// TB ? COUGH/4/des/L,M,H|1,2,3 ? BP/5/des/L,M,H|1,2,3
function data_in_string()
{
    //for all symptoms
    var str = $('#dname').val()+'?';
    for(var i=0;i<no;i++)
    {
        var ret = '';
        if (check_ar[i] === 0 )
            ret = make_fuzzy_string(i);
        else {
                ret = make_fuzzy_string_checkbox(i);
        }
        if(ret==1 || $('#des'+i).val() === '')
        {
            alert("Please fill all the fields first!");
            return 1;
        }
        str = str+snames[i]+'/'+sw[i]+'/'+ret+'/'+$('#des'+i).val()+'/'+check_ar[i];

      if(i != no-1)
        str = str + '?';
    }
    console.log(str);
    console.log(precaution+"  "+specialist);
    ajax_call(str);

}
function make_fuzzy_string_checkbox(sym)
{
     var str1 = "";
     var str2 = "";
     for(var i=1; i<=srow[sym] ; i++)
     {

        var fv1 = $('#s'+sym+'_'+i+'_1').val();
        var fv2 = $('#s'+sym+'_'+i+'_2').val();
        var ev = $('#s'+sym+'-'+i).val();

        if(!fv1 || !fv2)
        {
            return 1;
        }
        str1 = str1+fv1+'-'+fv2;
        str2 = str2+ev;

        if(i!=srow[sym])
        {
            str1 +=',';
            str2 +=',';
        }
    }
    return str1+'|'+str2;
}
//converts fuzzy values to given format
function make_fuzzy_string(sym)
{
    var str1 = "";
    var str2 = "";
    for(var i=1; i<=srow[sym] ; i++)
    {

        var fv = $('#s'+sym+'_'+i).val();
        var ev = $('#s'+sym+'-'+i).val();

        if(!fv)
        {
            return 1;
        }
        str1 = str1+fv;
        str2 = str2+ev;

        if(i!=srow[sym])
        {
            str1 +=',';
            str2 +=',';
        }
    }
    return str1+'|'+str2;
}
```

```
//finally data is sent to php
function ajax_call(str)
{

    $.ajax({
        url   : "../php/add_to_db.php",
        type  : "POST",
        async : false,
        data  : {
                  "str" : str ,
                  "precaution" : precaution,
                  "specialist" : specialist
                },
        success: function(data)
        {
            console.log(data);
            $("#modal_button").click();
            //redirect to new page
        }
    });
}
//Checks if the symptom name already added to database before (may be a different disease)
//If so, then don't let doctor to add new fuzzy values
//Instead load the same fuzzy values as added before!
function check_sym(str)
{
    $.ajax({
        url   : "../php/check_sym.php",
        type  : "POST",
        async : false,
        data  : {
                  "str" : str ,
                },
        success: function(data)
        {
            if(data==-1)
                in_db = false;
            else
            {
                alert("Symptom "+str+" is already added to database.Fuzzy values will remain same.("+data+")");
                fv_ar = data.split(",");
                in_db = true;
            }
        }
```

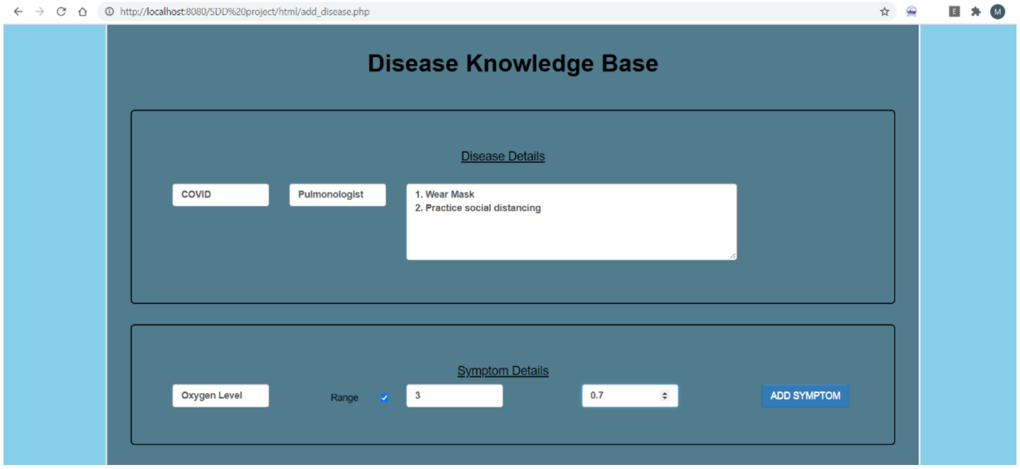
```
   });
}
//Makes input disabled for symptoms which already exist in database!
function make_disabled()
{
   var ind = no-1;
   for(var i=1;i<=srow[ind];i++)
   {
      var id = '#s'+ind+'_'+i;
      $(id).prop("disabled", true );
      //alert(fv_ar[i-1]);
      $(id).val(fv_ar[i-1]);}}
```

SCREENSHOTS:



2 types of symptoms can be taken

- **In a range:**



COVID

Pulmonologist

1. Wear Mask
2. Practice social distancing

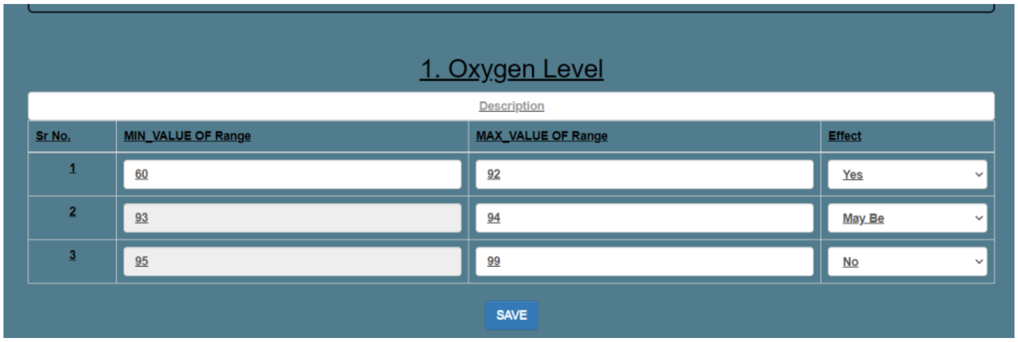
Oxygen Level

Range ☑

3

0.7

Click on add symptoms and Enter the inputs

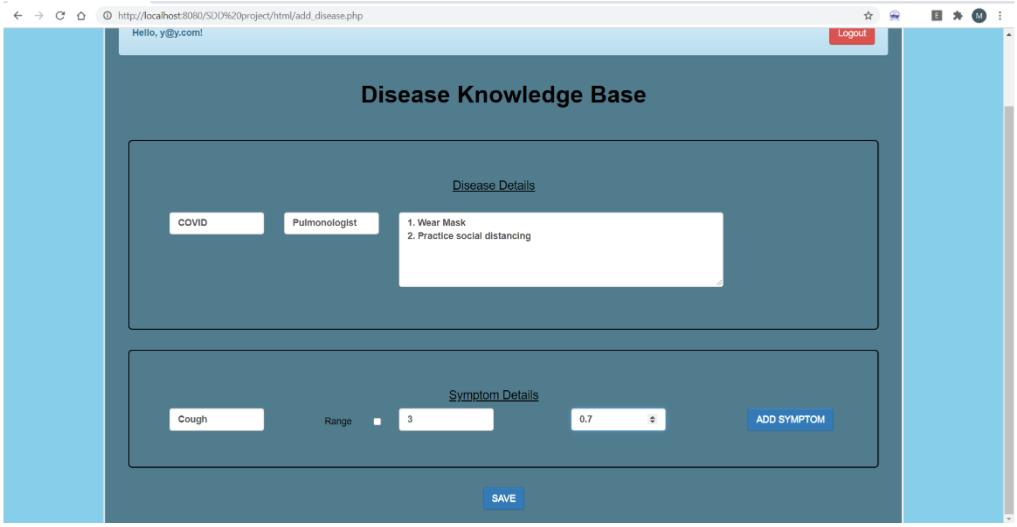


1. Oxygen Level

Description

Sr No.	MIN_VALUE OF Range	MAX_VALUE OF Range	Effect
1	60	92	Yes
2	93	94	May Be
3	95	99	No

- **Discrete values:**



Disease Knowledge Base

Disease Details

COVID

Pulmonologist

1. Wear Mask
2. Practice social distancing

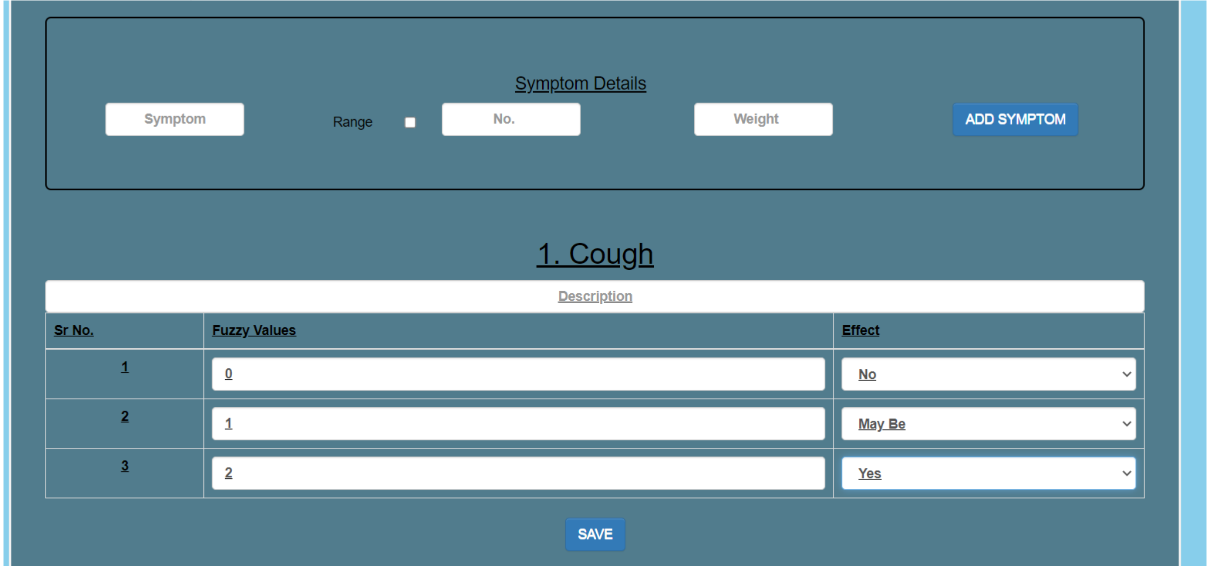
Symptom Details

Cough

Range □ 3

0.7

Click on add symptom and Enter data like:



Symptom Details

1. Cough

Description

Sr No.	Fuzzy Values	Effect
1	0	No
2	1	May Be
3	2	Yes

Testing Fuzzy System

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

```
 <head>
  <title>Testing Fuzzy System!</title>
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
  <script src="../js/jquery.js" type="text/javascript"></script>
  <script src="../bootstrap/js/bootstrap.min.js"></script>
  <link rel="stylesheet" href="../bootstrap/css/bootstrap.min.css">
  <link rel="stylesheet" href="../bootstrap/css/bootstrap-theme.min.css">
  <link rel="stylesheet" href="../bootstrap/css/bootstrap.css">
 </head>
 <body style="background-color: skyblue;">

  <div class= "inside2">
  <div class="container alert-info">

    <h1 style ="align:center">Testing Fuzzy System!</h1>

  </div>


  <div class="">
      <br /> <br />
      <div id="LoadingImage" class="container" style="display: none">
        <img src="../img/loader.gif" />
      </div>
      <div id="add_here" class="container alert-info" style="display: none">
      </div>
  </div>
</div>
 </body>
</html>

<script>
var zero = [];
var one = [];
var two = [];
var three = [];
var arr_2d = [];
var json = '';
var TP = TN = FP = FN = 0;
var predicted_no = predicted_yes = actual_no = actual_yes = 0;


var csv_columns = ['AGE', 'GENDER', 'CHEST PAIN', 'BP', 'CHOLESTEROL', 'FASTING BLOOD SUGAR'
, 'RESTING ELECTROCARDIOGRAPHY', 'HEART RATE', 'EXERCISE INDUCED ANGINA', 'OLD PEA
```

```
K', 'SLOPE OF PEAK EXERCISE', 'CA' , 'THAL' , 'NUM'];

var is_range = [1, 0, 0, 1, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0];

var sname = [];
var fv = [];
var c = c1 =  0;

function getAllSym()
{
    $.ajax({
       url:"../php/user_form.php",
       dataType:"text",
       async:true,
       success:function(data)
       {
            make_array(data);
       }

   });

}

function make_array(str)
{
    var ar = str.split('|');
    for (var i = 0; i < ar.length; i++) {
        var ind = ar[i].indexOf(',');
        sname[i] = ar[i].substring(0,ind);
        fv[i] = ar[i].substring(ind+1,ar[i].length).split(',');
    }
    handle_csv();
}


function handle_csv()
{
         $("#LoadingImage").show();
         $.ajax({
           url:"../csv/heart_disease_all14.csv",
           dataType:"text",
           async:true,
           success:function(data)
           {
```

```
var lines = data.split(/\r?\n|\r/);
for(var count = 0; count<lines.length; count++)
{
 var cell_data = lines[count].split(",");
 arr_2d.push(cell_data);
}

for(var i=0; i<arr_2d.length-1; i++)
{
  var cur_row = '';
  for(var j=0; j<arr_2d[0].length-1; j++)
  {
    if(j == 3 || j == 9 || j == 10)
     continue;

    var cur = parseFloat(arr_2d[i][j]);
    if(is_range[j] === 1)
    {
      sym:
      for(var k=0; k<sname.length; k++)
      {

       if(sname[k] === csv_columns[j])
       {
          var cur_fv = fv[k];

          for(var f=0; f<cur_fv.length; f++)
          {
            var minmax = cur_fv[f].split('-');
            var min = parseFloat(minmax[0]);
            var max = parseFloat(minmax[1]);

            if(cur >= min && cur <= max)
            {
              cur_row += csv_columns[j]+','+cur_fv[f];
              break sym;
            }
          }
        }
      }




    }
```

```
           else
           {
             cur_row += csv_columns[j]+','+cur;
           }


           if(j != arr_2d[0].length-2)
            cur_row += '|';
         }
         console.log(cur_row);
         ajax_call(cur_row, i);
       }



       var e = '#add_here';

       var tb1 = '<h2 class="heading"> Confusion Matrix </h2><div class="vertical-gap"><table class="table table-responsive table-bordered "><thead><tr><th>N=299 </th><th>predicted_no</th><th>predicted_yes</th></tr></thead><tbody>';
       var tb2 = '</tbody></table></div>';
       var r1 = '<tr><th>actual_no</th><td>TN = '+TN+'</td><td>FP = '+ FP+'</td><td>'+parseFloat(TN+FP)+'</td></tr>';
       var r2 = '<tr><th>actual_yes</th><td>FN = '+FN+'</td><td>TP = '+ TP+'</td><td>'+parseFloat(FN+TP)+'</td></tr>';
       var r3 = '<tr><th></th><td>'+parseFloat(TN+FN)+'</td><td>'+ parseFloat(FP+TP)+'</td><td>'+parseFloat(TP+TN+FP+FN)+'</td></tr>';


       $(e).append(tb1+r1+r2+r3+tb2);
       $(e).append('<br><br><b>Accuracy : </b>'+(((TP+TN)/(arr_2d.length-1)*100).toFixed(2) + '%'));
       $(e).append('<br><br><b>True Positive Rate(Sensitivity) : </b>'+(((TP)/actual_yes)*100).toFixed(2) + '%');
       $(e).append('<br><br><b>False Positive Rate : </b>'+(((FP)/actual_no)*100).toFixed(2) + '%');
       $(e).append('<br><br><b>Specificity : </b>'+(((TN/actual_no))*100).toFixed(2) + '%');
       $(e).append('<br><br><b>Precision : </b>'+(((TP/predicted_yes))*100).toFixed(2) + '%');
       $(e).append('<br><br><b>Error Rate : </b>'+(((FP+FN)/(arr_2d.length-1)*100).toFixed(2) + '%'));
       $(e).append('<br><br><b>Prevalence : </b>'+(((actual_yes/(arr_2d.length-1)))*100).toFixed(2) + '%');

       $(e).show();
       console.log("total match = "+(c/(arr_2d.length-1)));
       $("#LoadingImage").hide();
      }
    });
```

```
}


function ajax_call(str, i)
{
  console.log(str);
  $.ajax({
     url   : "../php/evaluate_testing.php",
     dataType:'json',
     type  : "POST",
     data: {
      'str' : str,
     },
     async : false,
     success: function(data)
     {
       json = (data);
       var severity = parseFloat(json.Heart_Disease).toFixed(2);
       console.log(severity);
       var out = 1;
       if(severity < 63){
         out = 0;
         predicted_no++;
       }
       else
        predicted_yes++;


       if(arr_2d[i][13] == 0){
         actual_no++;
         if(out == 0)
          c++;
       }
       else{
        actual_yes++;
        if(out == 1)
         c++;
       }



       console.log(i+"       "+severity+"   "+arr_2d[i][13]);
```

```
              if(arr_2d[i][13] == 0 && out == 0)
                  TN += 1;
              else if(out == 1 && arr_2d[i][13] >= 1)
                  TP += 1;
              else if(out == 1 && arr_2d[i][13] == 0)
                  FP += 1;
              else
                  FN += 1;
          },
          error : function(){
            console.log('Error in ajax');
          },

    });

}

function mean(numbers) {
    var total = 0, i=0;
    for (i = 0; i < numbers.length; i += 1) {
        total += parseFloat(numbers[i]);
    }

    return parseFloat(total / numbers.length);
}

function median(numbers) {
    var median = 0, numsLen = parseFloat(numbers.length);
    numbers.sort();

    if (numsLen % 2 === 0 ) {
        median = parseFloat((parseFloat(numbers[numsLen / 2 - 1]) + parseFloat(numbers[numsLen / 2])) / 2);
    } else {
        median = parseFloat(numbers[(numsLen - 1) / 2]);
    }

    return median;
}

$(document).ready(function(){
  getAllSym();
});

</script>
```

Team Member 5: 18BCB0139 , V SHRUTHIY

- **Testing Fuzzy Logic**

```
<?php

 require "dp.php";
 if(!isset($_POST['str']))
     return;
 $st = explode('|',$_POST['str']);
 $sname = array();
 error_log("Oracle database not available!", 0);

 $hm = array();

 for ($i=0; $i < sizeof($st); $i++) {

     $ind = strpos($st[$i], ',');
     $sname = substr($st[$i],0,$ind);
     $fv = substr($st[$i],$ind+1,strlen($st[$i]));

     $q2 = "Select * from symptom where sname='".$sname."'";
     $res2 = mysqli_query($con,$q2);
     $fvar=[];
     while($row2 = $res2->fetch_array())
     {
         $fvar = explode(',',$row2['fuzzy_set']);
         $sid  = $row2['sid'];
     }

     for ($j=0; $j < $fvar ; $j++)
     {
       if($fv == $fvar[$j])
       {
         $hm[$sid]=$j;
         break;
       }
     }
 }

 $main_arr = all_dis($con,$hm);
 $results = [];

 foreach ($main_arr as $key => $value) {

   $q2 = "Select * from diag";
   $res2 = mysqli_query($con,$q2);
   $num=0;
   $denom=0;
   while($row2 = $res2->fetch_array())
   {
     $yes = $row2['yes'];
     $no = $row2['no'];
     $maybe = $row2['maybe'];
     $x = $row2['x'];

     $fx = $yes*$value[1]+$maybe*$value[2]+$no*$value[3];
     $denom += $fx;
     $num += ($fx*$x);
   }


   $ci = $num/(100*$denom);
   $cy = 0.87;

   $per = ($ci*100)/$cy;
   $results[$key] = $per;


   file_put_contents('php://stderr',"Ci === ".$ci."per ==".$per);
 }

 echo json_encode($results);

function all_dis($con,$hm)
 {
  $main_arr = [];
  $idd = "2";
  $q1 = 'Select * from disease where did="'.$idd.'"';
  $res = mysqli_query($con,$q1);

  while($row = $res->fetch_array())
  {
   $did = $row['did'];
   $q2 = "Select * from mapping where did='".$did."'";
```

```
    $res2 = mysqli_query($con,$q2);

    $dis_arr = array('1'=>0,'2'=>0,'3'=>0);
    while($row2 = $res2->fetch_array())
    {

        $fvar = explode(',',$row2['fv']);
        $dis_arr[$fvar[$hm[$row2['sid']]]] += $row2['weight'];
    }

    $sum = $dis_arr[1]+$dis_arr[2]+$dis_arr[3];

    if($sum!=0){

      $dis_arr[1] /= $sum;
      $dis_arr[2] /= $sum;
      $dis_arr[3] /= $sum;
    }

    $main_arr[$row['dname']] = $dis_arr;
  }
  return $main_arr;
}
```

- **EVALUATING FUZZY LOGIC**

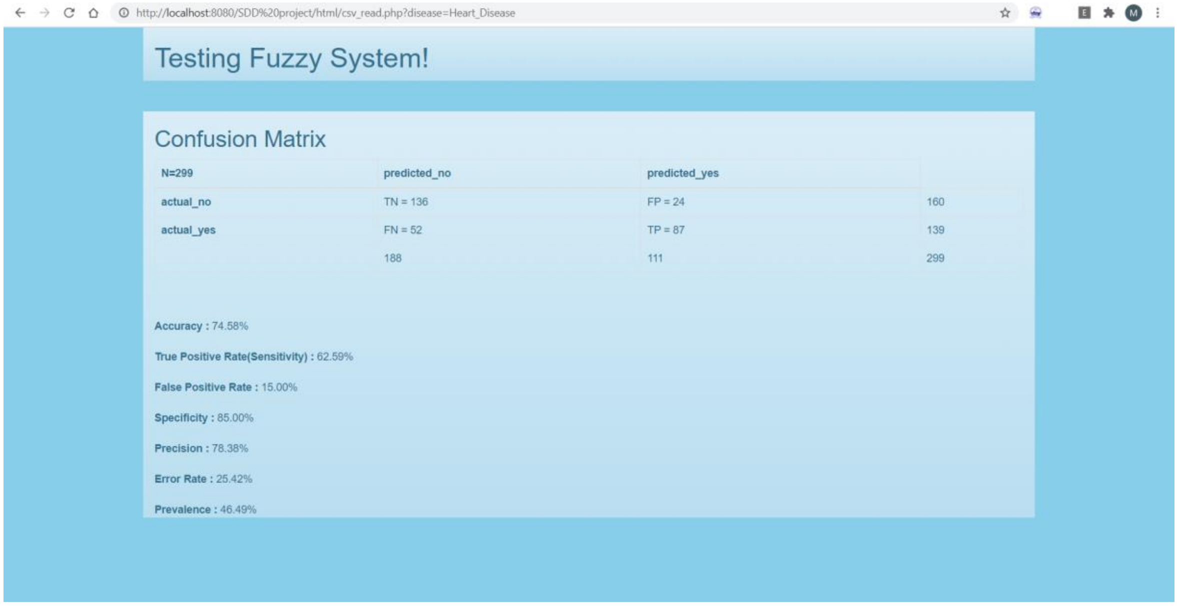
```
<?php

  require "dp.php";
  if(!isset($_POST['str']))
      return;
  $st = explode('|',$_POST['str']);
  $sname = array();
  error_log("Oracle database not available!", 0);

  //key as symptom name,value as index of fuzzy value(0 based indexing)
  $hm = array();

  for ($i=0; $i < sizeof($st); $i++) {

      $ind = strpos($st[$i], ',');
      $sname = substr($st[$i],0,$ind);
      $fv = substr($st[$i],$ind+1,strlen($st[$i]));
      $q2 = "Select * from symptom where sname='".$sname."'";
      $res2 = mysqli_query($con,$q2);
      $fvar=[];
      while($row2 = $res2->fetch_array())
      {
        $fvar = explode(',',$row2['fuzzy_set']);
        $sid  = $row2['sid'];
      }

      for ($j=0; $j < $fvar ; $j++)
      {
       if($fv == $fvar[$j])
       {
        $hm[$sid]=$j;
        break;
       }
      }
  }

  //file_put_contents('php://stderr', print_r($hm, TRUE));
  $main_arr = all_dis($con,$hm);
  //file_put_contents('php://stderr', print_r($main_arr, TRUE));

  //$str = "";

  $results = [];

  //defuzzication for each disease!
  foreach ($main_arr as $key => $value) {

      $q2 = "Select * from diag";
      $res2 = mysqli_query($con,$q2);
      $num=0;
      $denom=0;
      while($row2 = $res2->fetch_array())
      {
        $yes = $row2['yes'];
        $no = $row2['no'];
        $maybe = $row2['maybe'];
        $x = $row2['x'];

        $fx = $yes*$value[1]+$maybe*$value[2]+$no*$value[3];
        $denom += $fx;
        $num += ($fx*$x);
      }
      //$ci  = centroid of the overall diagnosis decision fuzzy set
      //$cy = centroid for the Yes fuzzy set

      $ci = $num/(100*$denom);
      $cy = 0.87;
     //echo $ci.'    '.$cy;
      //$per = certainty of presence of the disease di in percent
      $per = ($ci*100)/$cy;
      $results[$key] = $per;

      //echo $key;
      //echo implode(",", $value);
      //$str = "num = ".$num." denom = ".$denom." \n";
      //echo $str;
     //error_log($str, 0);
      file_put_contents('php://stderr',"Ci === ".$ci."per ==".$per);
      // echo $key." -- >".$per." \n";
  }

  echo json_encode($results);



//Finding the weights of yes,no and may_be
//for each disease and return the array

function all_dis($con,$hm)
  {
     $main_arr = [];
     $q1 = "Select * from disease";
     $res = mysqli_query($con,$q1);

     while($row = $res->fetch_array())
     {
      $did = $row['did'];
      //echo $did;

      $q2 = "Select * from mapping where did='".$did."'";
      $res2 = mysqli_query($con,$q2);

      $dis_arr = array('1'=>0,'2'=>0,'3'=>0);
      while($row2 = $res2->fetch_array())
      {
        $fvar = explode(',',$row2['fv']);
```

```
      $dis_arr[$fvar[$hm[$row2['sid']]]] += $row2['weight'];
                //1,2,3 -->yes,maybe,no
    }

    $sum = $dis_arr[1]+$dis_arr[2]+$dis_arr[3];

    if($sum!=0){

      $dis_arr[1] /= $sum;
      $dis_arr[2] /= $sum;
      $dis_arr[3] /= $sum;
    }
    $main_arr[$row['dname']] = $dis_arr;
  }
  return $main_arr;
}
```

- **LOGOUT:**

```
<?php
  session_start();
  session_destroy();
  header('location:../html/disease_prediction_system.php');
?>
```

SCREENSHOTS:


http://localhost:8080/SDD%20project/html/csv_read.php?disease=Heart_Disease

Testing Fuzzy System!

Confusion Matrix

N=299	predicted_no	predicted_yes	
actual_no	TN = 136	FP = 24	160
actual_yes	FN = 52	TP = 87	139
	188	111	299

Accuracy : 74.58%

True Positive Rate(Sensitivity) : 62.59%

False Positive Rate : 15.00%

Specificity : 85.00%

Precision : 78.38%

Error Rate : 25.42%

Prevalence : 46.49%