# BRAIN STROKE PREDICTION APPLICATION

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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**DHAKA, BANGLADESH**

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## APPROVAL

This Project titled "**BRAIN STROKE PREDICTION APPLICATION**", submitted by Zarin Tasnim and Md Said Mahmud and Erina Kabir to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 2/6/2021

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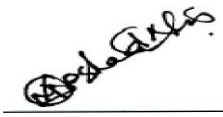

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# DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Md. Azizul Hakim, Senior Lecturer, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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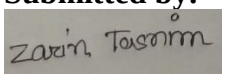

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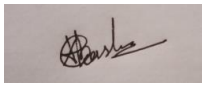

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Finally, we must acknowledge with due respect the constant support and patients of our parents.

# ABSTRACT

In this modern era everyone wants to live a healthy and smart life, and day by day people are being dependent on their smart phone. And this world now requires some smart technology which provides excellent health system to assure that people community can live healthy life. It is true that day by day we getting smart and modern but it is also true that people are suffering much than before from many kinds of health issues, like Cancer, Heart Attack, Brain Stroke etc. So, it is very important for everyone to get instant healthcare. So, here we made an application which is called "Brain Stroke Prediction Application", by using this application people can get idea about the condition of their brain by measuring their brain stroke possibilities. This is an web based android application where a user have to get access first with their required information and after that they have to fill the requirement form for getting the result of their brain stroke possibilities. And after that there is a neurologist has been suggested in case user needs any suggestion. The ambition of making this project is to provide an instant report or medical direction for a patient who needs to know about their brain's condition.

# TABLE OF CONTENTS


| CONTENTS | PAGE |
|---|---|
| Board of examiners | i-ii |
| Declaration | iii |
| Acknowledgments | iv |
| Abstract | v |
| **CHAPTER** | |
| **CHAPTER 1: INTRODUCTION** | **1-4** |
| 1.1 Introduction | 1 |
| 1.2 Motivation | 1 |
| 1.3 Objectives | 2 |
| 1.4 Expected outcome | 2 |
| 1.5 Report Layout | 2-4 |
| **CHAPTER 2: BACKGROUND** | **5-6** |
| 2.1 Introduction | 5 |
| 2.2 Related Works | 5 |
| 2.3 Scope of the Project | 6 |
| 2.4 Challenges | 6 |
| **CHAPTER 3: REQUIREMENT SPECIFICATION** | **7-16** |
| 3.1 Business Process Modeling | 7 |
| 3.2 Requirement Collection and Analysis | 7 |
| 3.3 Software requirements | 8 |

3.4 Hardware requirements 8

3.5 Functional requirements 8

3.6 Use Case Diagram and Description 9

3.7 Logical Data Model 15

3.8 Design requirements 16

**CHAPTER 4: DESIGN SPECIFICATION 17-20**

4.1 Front-end Design 17

4.2 Back-end Design 17

4.3 Interaction Design and UX 19

4.4 Implementation Requirements 20

**CHAPTER 5: IMPLEMENTATION AND TESTING 21-29**

5.1 Implementation of Database 21

5.1.1 Registration Page 23

5.1.2 Login Page 24

5.1.3 Home page 25

5.1.4 Brain Stroke Prediction Form 26

5.1.5 Result Page 28

5.2 Implementation of Interactions 29

5.3 Testing Implementation 29

**CHAPTER 6: IMPACT ON SOCIETY, ENVIRONMENT, AND SUSTAINABILITY 30**

6.1 Impact on Society 30

6.2 Impact on the Environment 30

6.3 Sustainability Plan 30

**CHAPTER 7: CONCLUSION AND FUTURE SCOPE 31-32**

7.1 Discussion and Conclusion 31

7.2 Scope for Future Developments 31

**APPENDIX 33**

**REFERENCES 34**

# LIST OF FIGURES


| FIGURES | PAGE |
|---|---|
| Figure 3.1: BPM for “Brain Stroke prediction App”. | 7 |
| Figure 3.2: Use Case Diagram of “Brain Stroke Prediction App”. | 9 |
| Figure 3.3: ER-Diagram of “Brain Stroke Prediction Application”. | 15 |
| Figure 3.4: Flowchart of “Brain Stroke Prediction Application”. | 16 |
| Figure 5.1: Database Formation | 21 |
| Figure 5.2: Fields for Registration Page | 23 |
| Figure 5.3: Login Page | 24 |
| Figure 5.4: Home Page | 25 |
| Figure 5.5: Prediction Form | 26 |
| Figure 5.6: Result Page | 28 |

# LIST OF TABLES


| TABLES | PAGE |
|---|---|
| Table 3.1: Use Case Description for Registration | 10 |
| Table 3.2: Use Case Description for Login | 10 |
| Table 3.3: Use Case Description for Disease Prediction | 11 |
| Table 3.4: Use Case Description for Edit Profile | 11 |
| Table 3.5: Use Case Description for Add/Delete Doctor's Info | 12 |
| Table 3.6: Use Case Description for Add/Delete User Information | 12 |
| Table 3.7: Use Case Description for Add/Delete Symptoms Info | 13 |
| Table 3.8: Use Case Description for Wrong Info Combination | 13 |
| Table 3.9: Use Case Description for Logout | 14 |
| Table 4.1: Information List for the User | 18 |

# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction

“Brain stroke prediction app” is a web-based mobile app which will predict any person’s brain stroke possibilities by measuring the percentages of RBS, S. Cholesterol, S. Creatinine, LDL, HDL, Triglyceride, FBS, HbA1C, Hb, RBC.

This application will also check their ages and combine them with the percentages of those things to give a perfect prediction of brain stroke. Here in our application system a person can know the actual condition of his or her brain and can take the necessary steps. And if the condition of the brain is not so good then the application will give some instance guidance. At first in this application one user have to do register with fill up with some information about himself, then they have to log in in this application with their own account then they have to give the percentages about those things from which this application will predict the brain strokes possibilities.

## 1.2 Motivation

There were so many things to motivate ourselves for making this application. Brain and hurt is the most important body part of human body. But without our brain we can't live or we can't take any decision even we can't stand without it. So it is very important to take proper care of our brain.

But in our village area doctors are not available all time, So if we need to check the condition of our brain urgently but doctors are not currently available then we can check the condition cover brain by this application. We just need a prescription. Nowadays at least one smartphone is available in every house. And more than half of them are Android users and uses internet regularly[1]. So we have decided to build a smart mobile app so a person can easily install this app and can get entrance so easily to check their brain stroke possibilities.

### 1.3. Objectives

There are some objectives of our project. The objects of our project are:

- User will be helpful from this application.
- People will be able to know their brain stroke possibilities.
- People will get instant guidance according to the user input.
- Reduce the cost of medical test.
- From sitting home, user can know about their possibilities of brain stroke.

### 1.4 Expected Outcome

"Brain Stroke Prediction Application" will provide simple and easy interface to user so that people can feel more comfortable to use the application. Because all person would like to go in an easy and understandable way. By using this application people can save their valuable time. The expected outcomes of this application are given below:

- To create a superior site for general people or patient.
- Saving time
- Patient will get instant guidelines[2]
  Doctor will get more clients.
- People can able to get know about their possibilities of brain stroke anytime from anywhere.

### 1.5 Report Layout

To recognize this project without doubt, different parts are separated in different categories. Our research paper is separated in seven section and those chapter explanation are given below:

Section 1: Introduction

We mainly tell of what this app mainly carries in this introduction part. Beside that we described the motivation, objectives and the expected outcomes of the application in this chapter.

Section 2: Background

This app related works and range and also some key challenges of the project have been described in this section.

Section 3: Requirement Specifications

We discussed every modelling process offer project in this chapter like business process diagram, use case model, data model, ER model, and necessary things.

Section 4: Design Specifications

We discussed about every kind of coding design here.

Section 5: Implementation and Testing

Here we discussed about our database execution and also discussed about result testing.

Section 6: Impact on society, Environment and sustainability

How the application will impact on society and on environment it has been discussing here and also discussing why this application is feasibility.

## Section 7: Conclusion and Future Scope

This section carrying the discussion about this applications ending and future scope.

# CHAPTER 2

# BACKGROUND

## 2.1 Introduction:

It is an android app. Major idea beyond this application is to offer a substructure that predicts user's brain stroke possibilities .System inspects numerous sign and this disorder associated with these systems. Patient shares his or her symptoms and problems to the system. It processes patient's signs to inspect dissimilar diseases what possibly will connected with this whether this can't offer proper result, it notifies patient regarding this. Then patient can get suggestion from doctor. Here we talked about future scope, related project and challenges.

## 2.2 Related Works

This project exceptional prediction of brain stroke outlook has produced. So far there are some project which designed this point of view. Some of them are Smart Healthcare Application With Disease Prediction[3], where a patient can get instance guidance on their health issues. The software also lists different features like hospitals, ambulances, expert Doctors available where patients can search for hospitals, ambulances, and doctors for their clinical issues. In this application a user can able to get predictions by giving his/their health symptoms and also be able to know, are they suffering from specific diseases like dengue, malaria, typhoid, pneumonia etc. Instant Health Prediction[4]. In this application people can know their health problems from their Date of Birth. Doctor Bari[5].In this application they have provided some home remedies that anyone can follow to cure any of their common ailments at home. Smart Healthcare[6]. Smart healthcare can promote interaction between all parties in the healthcare field, ensure that participants get the services they need, help the parties make informed decisions, and facilitate the rational allocation of resources. Brain stroke prediction is very important in today. This app has few special attributes by which patient can see there user data at a time.

## 2.3 Scope of the Project

A Brain stroke Prediction app is made for those persons who have the possibility of brain stroke. This app has more unique features. This made this app more unique than other analogous project. We made this app for helping those people who are worry about having brain stroke and chance to have brain stroke. Today, android phones are available at people's hand. Now android phones are become a part of our life, as 96% of people uses android phones in this country. So, any people can be able to use this application. Also this app is very easy to install and use.

## 2.4 Challenges

As we have write a huge line of codes, sometimes it was really difficult to fix some error even a single error. We also faced challenges when we were working on the prediction system with patient's symptoms. Testing a project application in various versions of android is also a difficult task and copy button was wasting plentiful time. Those were really frustrating. And we have faced real challenge in the time of collecting data for brain stroke patient and implementing those in our project as we are not so good at making android application.

# CHAPTER 3

# REQUIRMENT SPECIFICATON

## 3.1 Business Process Modeling

Business Process Model in short BPM is the graphical representation of the workflows or business processes[7]. That identify the improvement. The Business Process Model for our application "BRAIN STROKE PREDICTION APPLICATION" is given below:

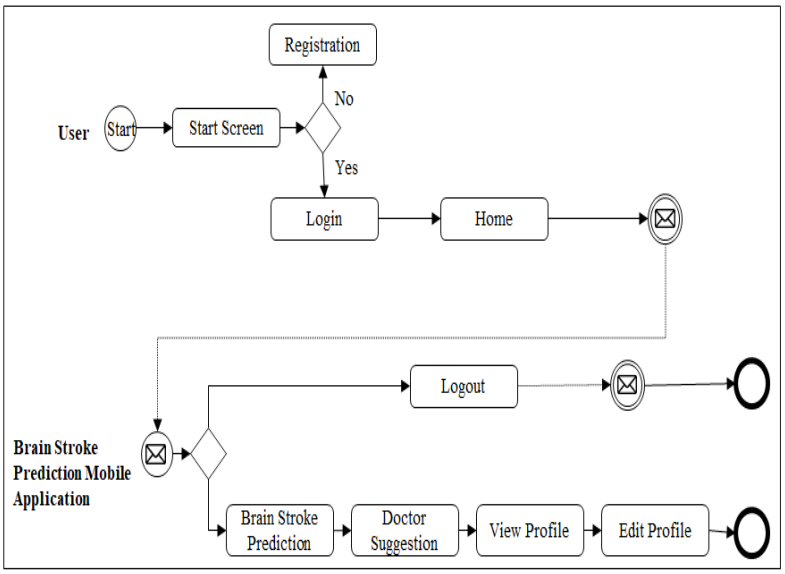


Figure 3.1: BPM for "Brain Stroke Prediction App"

## 3.2 Requirement Collection and Analysis

For building any app, we Requirement collection and Analysis such as software requirement, hardware requirement, functional requirement etc. In case of making our application we have used Use-case, ERD, Business Process Model and Flowchart diagram. Our Supervisor Md Azizul Hakim Sir has helped us a lot. He is a senior Lecturer of Daffodil International University. The requirement collection are described below.

### 3.3 Software Requirements

For the development of the application, we have used the following software:

- Operating System: Windows.
- System Design: Adobe Photoshop, Illustrator.
- Language: Hypertext Preprocessor[8], Hypertext markup language, Java.
- Database: MYSQL[9].
- Integrated Drive Electronics: Android Studio, Visual Studio Code.
- Tool: Java Development Kit.

Software Requirements of the application:

- Networks: Wireless Fidelity, Mobile Data.
- Compatible Device: Android smartphone.

### 3.4 Hardware Requirements

In case of development the app, we conducted the given hardware:

- Processor: Intel Core i3
- RAM: 3.00GB
- Space on disk: min 0.2 GB

### 3.5 Functional Requirements

- GUI
- Mysql

### 3.6 Use Case Diagram and Description

Use case diagram[10] of "Brain Stroke Prediction App" is given below:

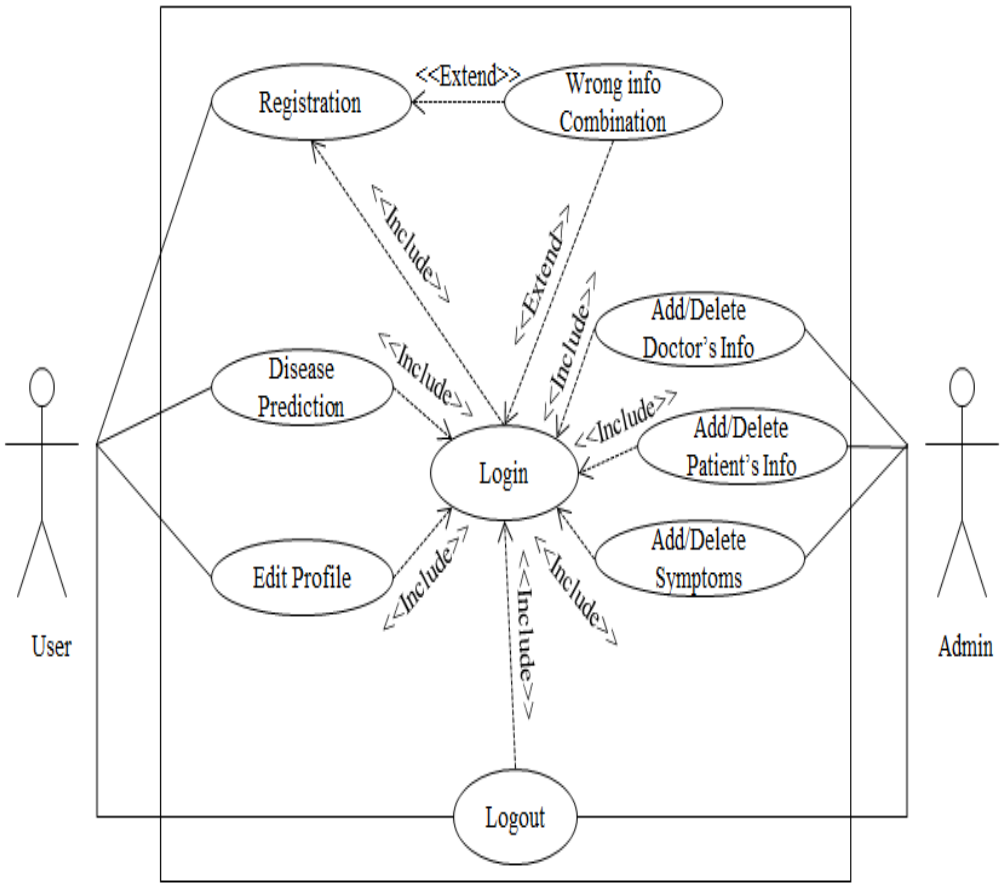


Figure 3.2: Use Case Diagram of "Brain Stroke Prediction App"

**Registration Use Case Description Table:**

The Registration Use Case Description Table is because of the Use Case description of Registration. Here, the actors, pre-condition, internal path and exceptional path of Registration because of Use Case are describing under:

Table 3.1: Use case description for Registration

| Use Case Name | Registration |
|---|---|
| Actors | Users/Patient |
| Pre-Condition | Method have to attached with the internet. |
| Internal Path | 1. Filling requisite info.<br>2. Pressing the submit switch. |
| Exceptional Path | 1. No option can be left vacant.<br>2. Email and mobile no cannot be match. |

**Login Use Case Description Table:**

The Login Use Case Description Table is because of the Use Case description of Login. Here, the actors, pre-condition, internal path and exceptional path of Login because of Use Case are describing under:

Table 3.2: Use case description for Login

| Use Case Name | Login |
|---|---|
| Actors | Users/Admin |
| Pre-Condition | User have to register. |
| Internal Path | 1. Providing Email and password<br>2. Pressing the login switch. |
| Exceptional Path | Wrong Email/password combination. |

**Disease Prediction Use Case Description Table**:

The Disease Prediction Use Case Description Table is because of the Use Case description of Disease Prediction. Here, the actors, pre-condition, internal path and exceptional path of Disease Prediction because of Use Case are describing under:

Table 3.3: Use case description for Disease Prediction

| Use Case Name | Disease Prediction |
|---|---|
| Actors | Users |
| Pre-Condition | Login |
| Internal Path | 1. Input data.<br>2. Click 'submit' switch |
| Exceptional Path | 1. Require all value before submit. |

**Edit Profile Use Case Description Table:**

The Edit Profile Use Case Description Table is for the Use Case description of Edit Profile. Here, the actors, pre-condition, internal path and exceptional path of Edit Profile for Use Case are describing under:

Table 3.4: Use case description for Edit Profile

| Use Case Name | Edit Profile |
|---|---|
| Actors | Users |
| Pre-Condition | Login |
| Internal Path | 1. Choose Profile<br>2. Providing Name, Email, Password.<br>3. Pressing the update switch. |
| Exceptional Path | Email and password cannot be match. |

**Add/Delete Doctor's Information Use Case Description Table:**

The Add/Delete Doctor's Information Use Case Description Table is for the Use Case description of Add/Delete Doctor's Information. Here, the actors, pre-condition, internal path and exceptional path of Add/Delete Doctor's Information for Use Case are describing under:

Table 3.5: Use case description for Add/Delete Doctor's Information

| Use Case Name | Add/Delete Doctor's Information |
|---|---|
| Actors | Admin |
| Pre-Condition | Login |
| Internal Path | 1. Providing doctor's name, doctor id, email and mobile no.<br>2. Pressing the add switch.<br>3. Pressing the Delete switch. |
| Exceptional Path | 1. Doctor's id and info can't be same. |

**Add/Delete User Information Use Case Description Table:**

The Add/Delete User Info Use Case Description Table is for the Use Case description of Add/Delete User Info. Here, the actors, pre-condition, internal path and exceptional path of Add/Delete User Information because of Use Case are describing under:

Table 3.6: Use case description for Add/Delete User Information

| Use Case Name | Add/Delete User Info. |
|---|---|
| Actors | Admin |
| Pre-Condition | Login |
| Internal Path | 1. User name, email, password, mobile no, city, age, gender.<br>2. Pressing the add switch.<br>3. Pressing the Delete' switch. |
| Exceptional Path | 1. User info can not be match. |

**Add/Delete Brain Stroke Symptoms Information Use Case Description Table:** The Add/Delete Brain Stroke Symptoms Information Use Case Description Table is for the Use Case description of Add/Delete Brain Stroke Symptoms Info. Here, the actors, pre-condition, internal path and exceptional path of Brain Stroke Symptoms Information for Use Case are describing under:

Table 3.7: Use case description for Add/Delete Symptoms Information

| Use Case Name | Add/Delete Brain Stroke Symptoms Information |
|---|---|
| Actors | Admin |
| Pre-Condition | Login |
| Internal Path | 1. Providing the symptoms name.<br>2. Pressing the add switch.<br>3. Pressing the Delete' switch. |
| Exceptional Path | 1. Filling up the Disease related info is must. |

**Wrong Information Combination Use Case Description Table:**

The wrong Information Combination Use Case Description Table is for the Use Case description of wrong Information Combination. Here, the actors, pre-condition, internal path and exceptional path of wrong Information Combination for Use Case are describing under:

Table 3.8: Use case description for Wrong Information Combination

| Use Case Name | Wrong Info Combination |
|---|---|
| Actors | User |
| Pre-Condition | Filling all Login info. |
| Internal Path | 1. Filling the requisite area.<br>2. Checking user info.<br>3. Pressing the login switch. |
| Exceptional Path | Vacant option doesn't work. |

**Logout Use Case Description Table:**

The Logout Use Case Description Table is because of the Use Case description of Logout. Here, the actors, pre-condition, internal path and exceptional path of Logout for Use Case are describing under:

Table 3.9: Use case description for Logout

| | |
|---|---|
| Use Case Name | Logout |
| Actors | Admin/Users |
| Pre-Condition | Login |
| Internal Path | 1. Choosing profile.<br>2. Pressing the logout switch. |
| Exceptional Path | 1. Session not working. |

### 3.7 Logistic data model

The logical data model illustrate the data in details. This provides structural and gentile view of the data. The logical data model display an overview of all entities, including their attributes and relationship. The ER Model represents the logical data model. The full from of ER model is Entity-Relationship Model. The ER Diagram of 'BRAIN STROKE PREDICTION APPLICATION' is given in figure 3.3

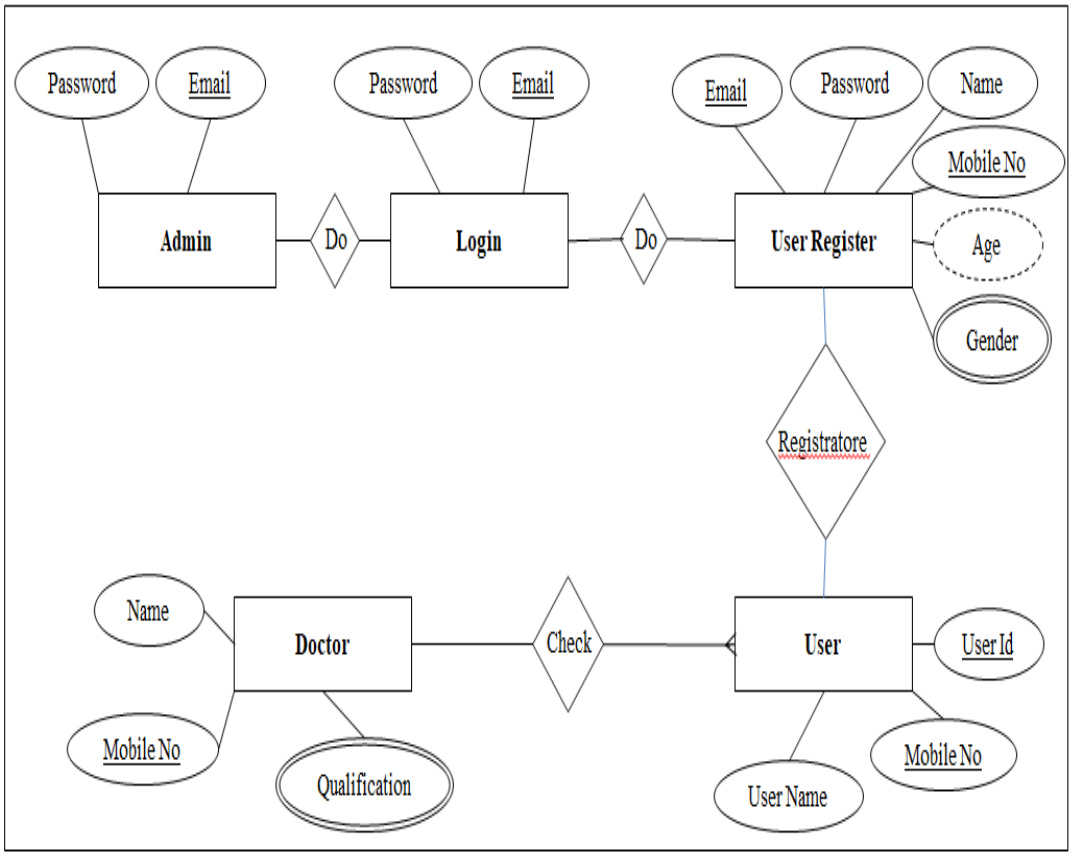


Figure 3.3: ER Diagram of "Brain Stroke Predication Application"

### 3.8 Design Requirements

Design is the most important thing for creating an application. For designing, we need Flowchart diagram. Flowchart is the ocular representation of the order of steps. And decisions needed to fulfill a process. So, the Flowchart diagram for our application "BRAIN STROKE PREDICTION APPLICATION' is given below:

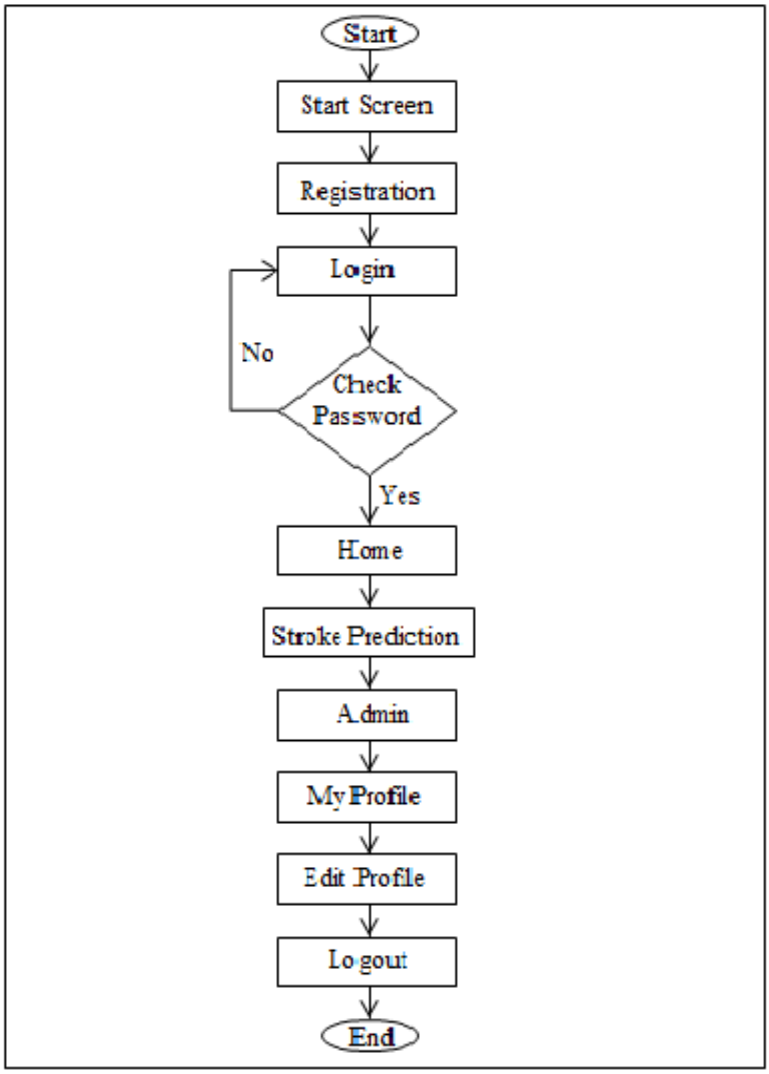


Figure 3.4: Flowchart of "Brain Stroke Predication App"

# CHAPTER 4

# DESIGN SPECIFICATION

## 4.1 Front-end Design

Front end design means Graphical User Interface. In short form, this is GUI. People get attracted by this design. Which Application's front end design is good, people get attract by this application and they use it. On the other hand, which Application's front end design is bad, people didn't get attract by this application and they not use it. We have tried our best to give our application a good front end design. So that, people are attracted towards our application. Front-end design of our application which is "BRAIN STROKE PREDICTION APPLICATION" is given below:

• HTML: We have used html to display content.

• CSS: CSS is being used for adjustment of html content.

• Bootstrap: Here, we used bootstrap version 4 for better design.

• JavaScript: We have used JavaScript for making dynamic layout.

## 4.2 Back-end Design

Back end design is connected with server-side. Through back end design the application is connected to the server. As back end design we used in our application "BRAIN STROKE PREDICTION APPLICATION" is:

• PHP

• And MySQL

**User Database Table**

At first the user have to fill up the registration form. When the users will fill up the registration form, all the information of users will be in database. When the user do login in system then the user information which is already saved to the database will be match with the email and password that the user was given to the registration form. Then the user logged in. The Database table of user is given under:

Table 4.1: Information List for the User

| id | name | Email | password | Phone number | City | age | Gender |
|---|---|---|---|---|---|---|---|
| 1 | Zarin Tasnim | tasnimzarin1888@gmail.com | ilovecode | 1796445147 | Rajshahi | 22 | Female |
| 2 | Erina Kabir | erinakabir@gmail.com | Eru123 | 1303279819 | Dhaka | 25 | Female |
| 3 | Md Prem | sagorislam824@gmail.com | 123456 | 1303603374 | Pabna | 21 | Male |
| 4 | Nazim | nazim.sr1994@gmail.com | 112233 | 1825615172 | Comilla | 22 | Male |
| 5 | Oronno | said15-8891@diu.edu.bd | 12345678 | 1737103270 | Dhaka | 24 | Male |
| 6 | Md. Azizul Hakim | shuvo038@gmail.com | 123456789 | 1673562638 | Dhaka | 30 | Male |

### 4.3 Interaction Design and UX

Interaction Design is the design which interact between users and products. This is a portion of User Experience. UX means Applications Experience. This supplies significant and pertinent experience to patient. And also Interaction Design inquire how a patient do interaction with system. What a user thinks when interacting with application-based system. In lieu of best experience gratifies a tangible user want. This is a tangible factor. Originally, seven factors here which affects the UX. The seven factors are given below:

• Useful

• Usable

• Valuable

• Desirable

• Findable

• Accessible

• Credible

Our application which is “BRAIN STROKE PREDICTION APPLICATION” is planned established on those seven factors. We created this app to keep in mind those significant points.

**Start Screen Interaction Design and UX:**

Home page refers to login page. It is highly facile with simple design, where users can spontaneously login and register.

**Registration Screen Interaction Design and UX:**

Registration screen is for the new users. So that users can register without any difficulty, providing some information such as name, email, phone number, city, gender.

**Login Screen Interaction Design and UX:**

Login screen design is easy design. For login, user just need to give their email and password. By giving email and password user can easily get access.

**Profile Screen Interaction Design and UX:**

In profile screen, patient can watch their information. User can change and modifying their details.

### 4.4 Implementation Requirements

Executing necessary things for our app are given below:

- Java
- Android Studio
- JDK
- MYSQL database
- PHP
- JavaScript

# CHAPTER 5

# IMPLEMENTATION AND TESTING

## 5.1 Implementation of Database

This is a back-end application which is mainly runs on a server. We are utilizing an online database which supplies details like real location, also reserves details. We have apply authentication because of registration and login details reserve. We also used a cloud based database so that we can add doctor suggestion brain stroke possibilities. Through the database connectivity we can see the real time data by tracing the location.

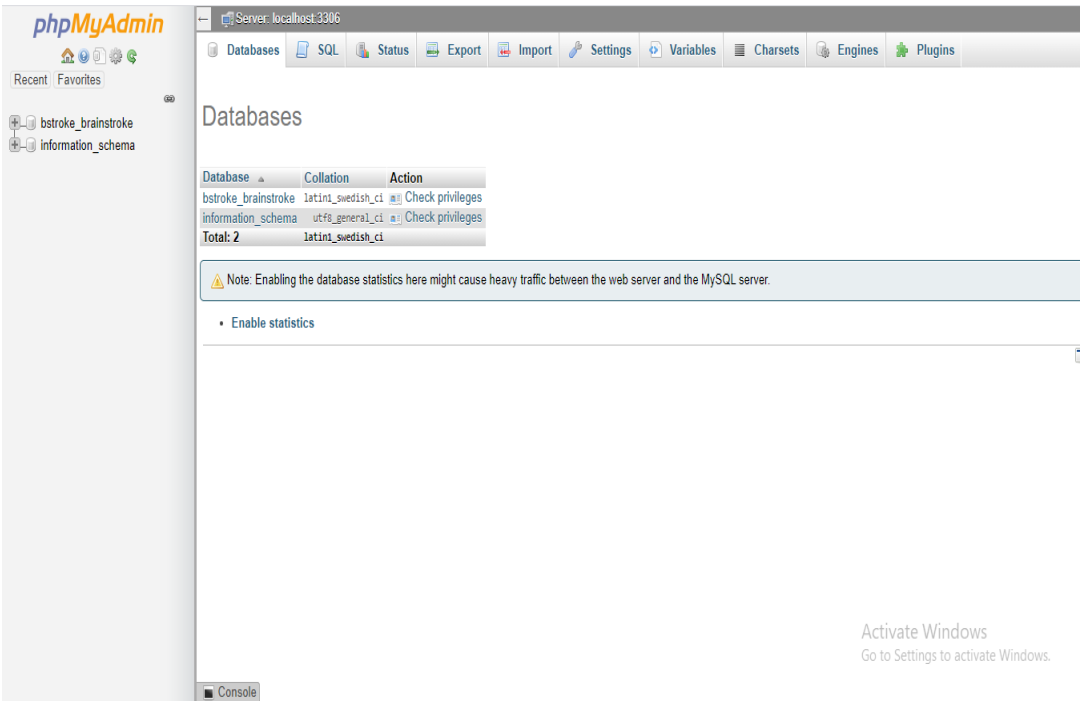


Figure 5.1: Database Formation of "Brain Stroke Prediction Mobile Application"

**Implementation table of Users**

This user carries some required fields for the database table such as name, email, password, phone number, age, gender, data for brain stroke prediction etc. Through this database tables data any person can log in to system by using that information which he or she has given on registration page. MySQL user table carrying those data, whenever any user desires to get access in with his or her user data then inspect it with the MySQL user data and if data is matched then go to the next activity.

**Implementation table of Users Confirmation**

This table carries the user identifier and user id. Primarily if any person attempts to get access, then confirmation inspects the users email and password.

### 5.1.1 Registration Page

We must fill registration form first to get access in this application. A new page will arrive when you will click the registration button. And for doing registration, you have to put your essential details.

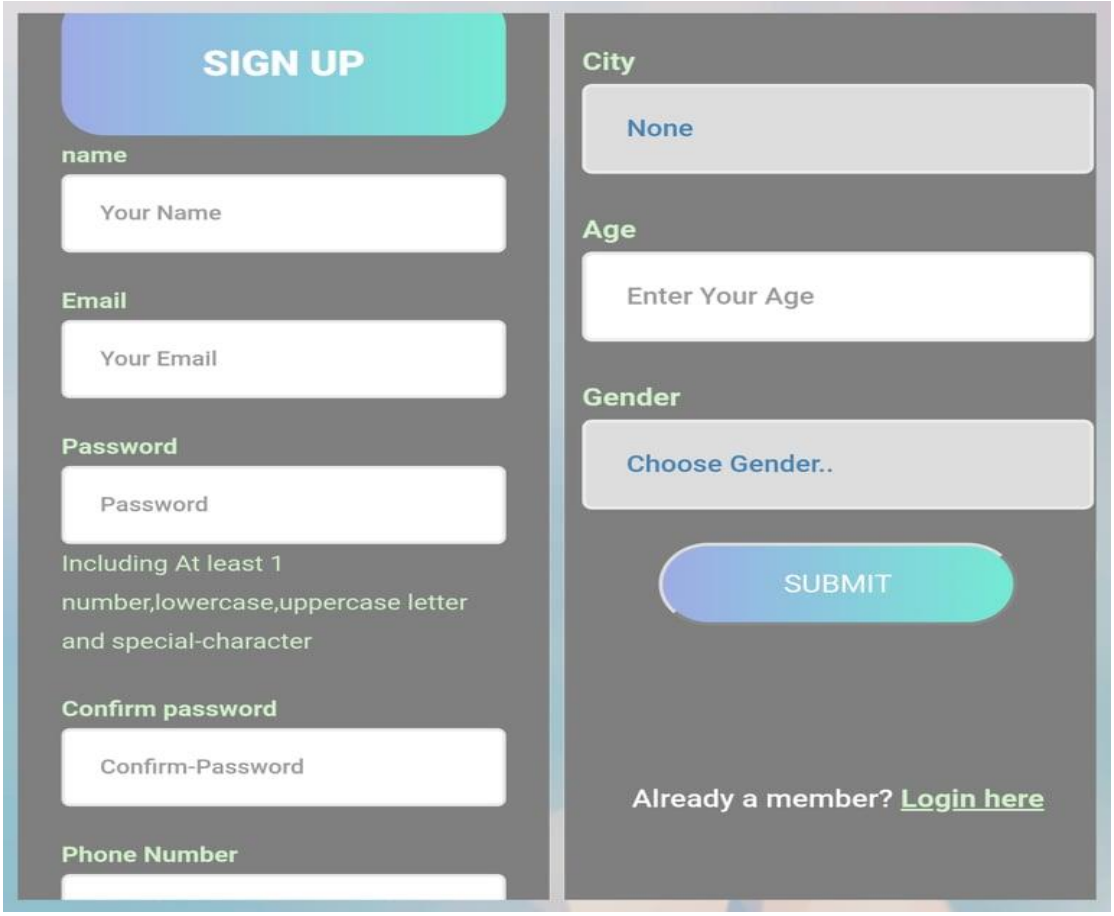


Figure 5.2 Fields for registration page

### 5.1.2 Login Page

After fill registration form a person can simply get access in the system. The user has to put his or her mobile no. and password and when the password matches then the user will get access in the app.

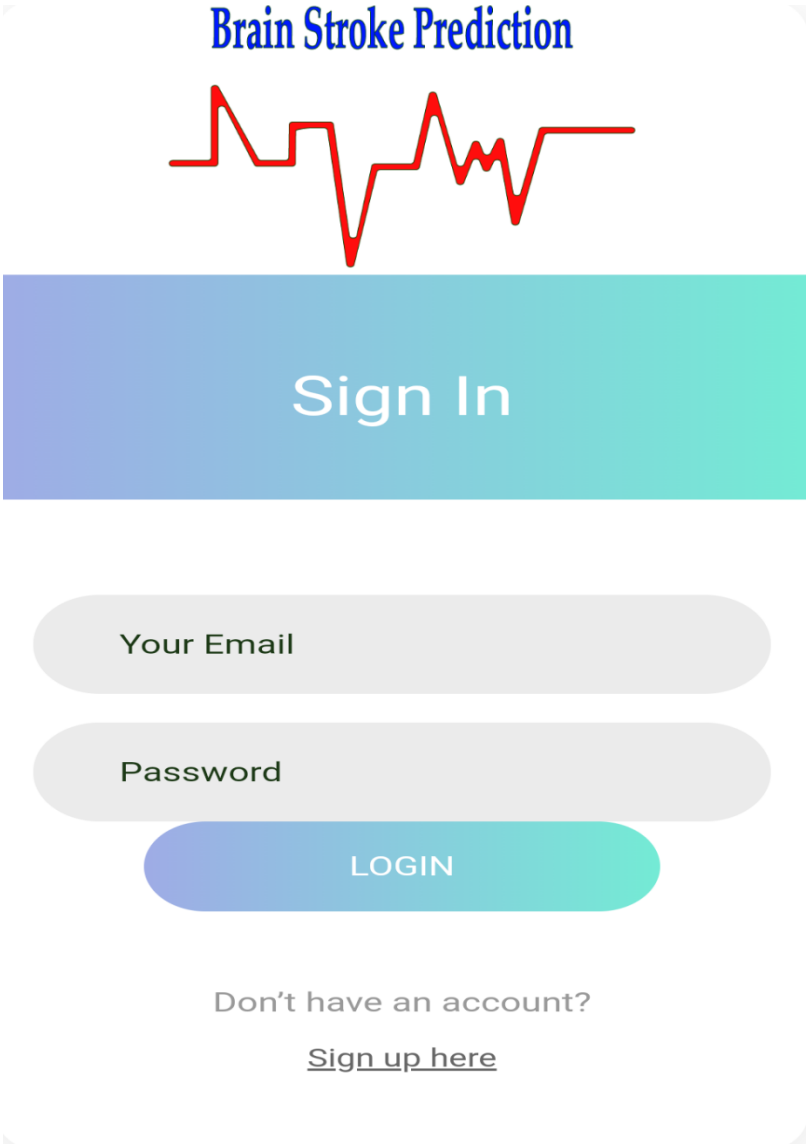


Figure 5.3: Login Page

### 5.1.3 Home Page

After get access user will watch the Homepage. Here user will see a feature called Brain Stroke Prediction it is the main features of our code by clicking this button user will enter the data form for predict brain stroke possibility, and also there is navbar which carries homepage, disease prediction form and admin profile.

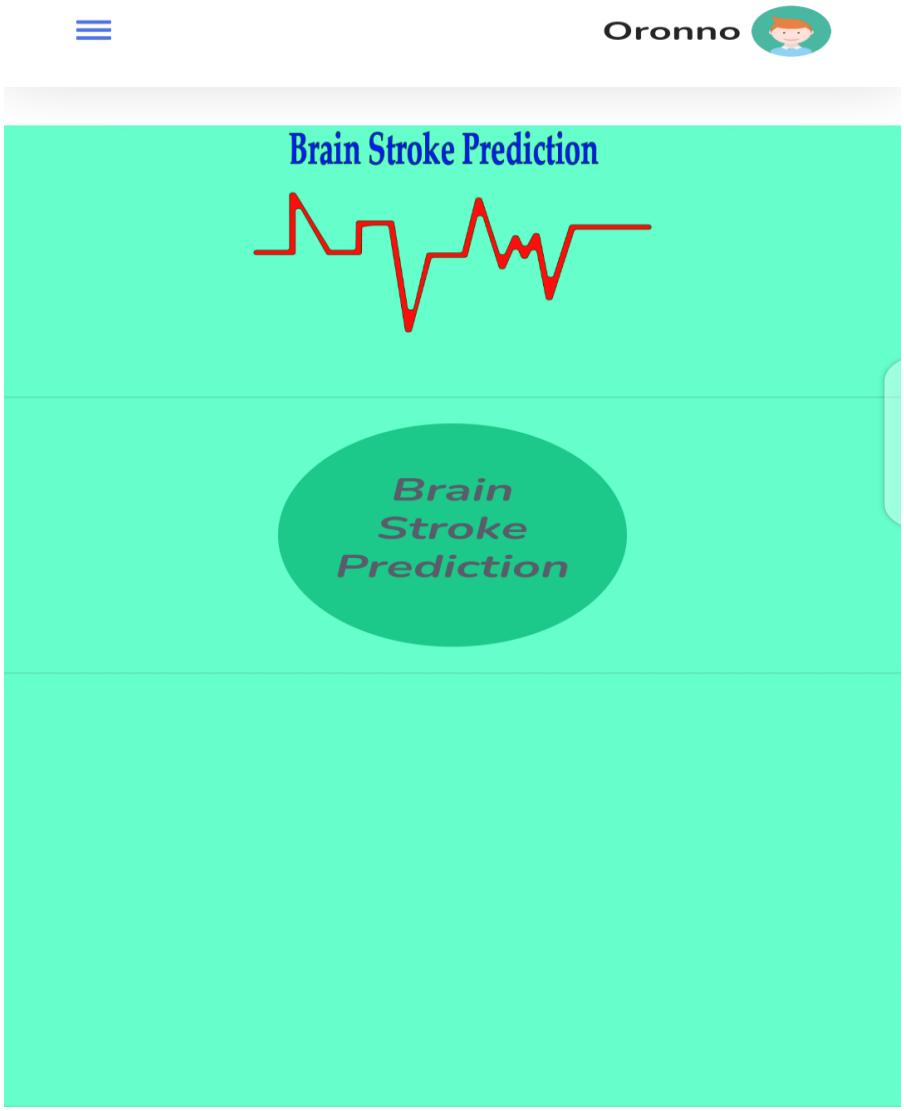


Figure 5.4: Home Page

### 5.1.4 Brain Stroke Prediction Form

After clicking brain stroke prediction button you will go in next page where you will see a requirement form and have to fill that form.

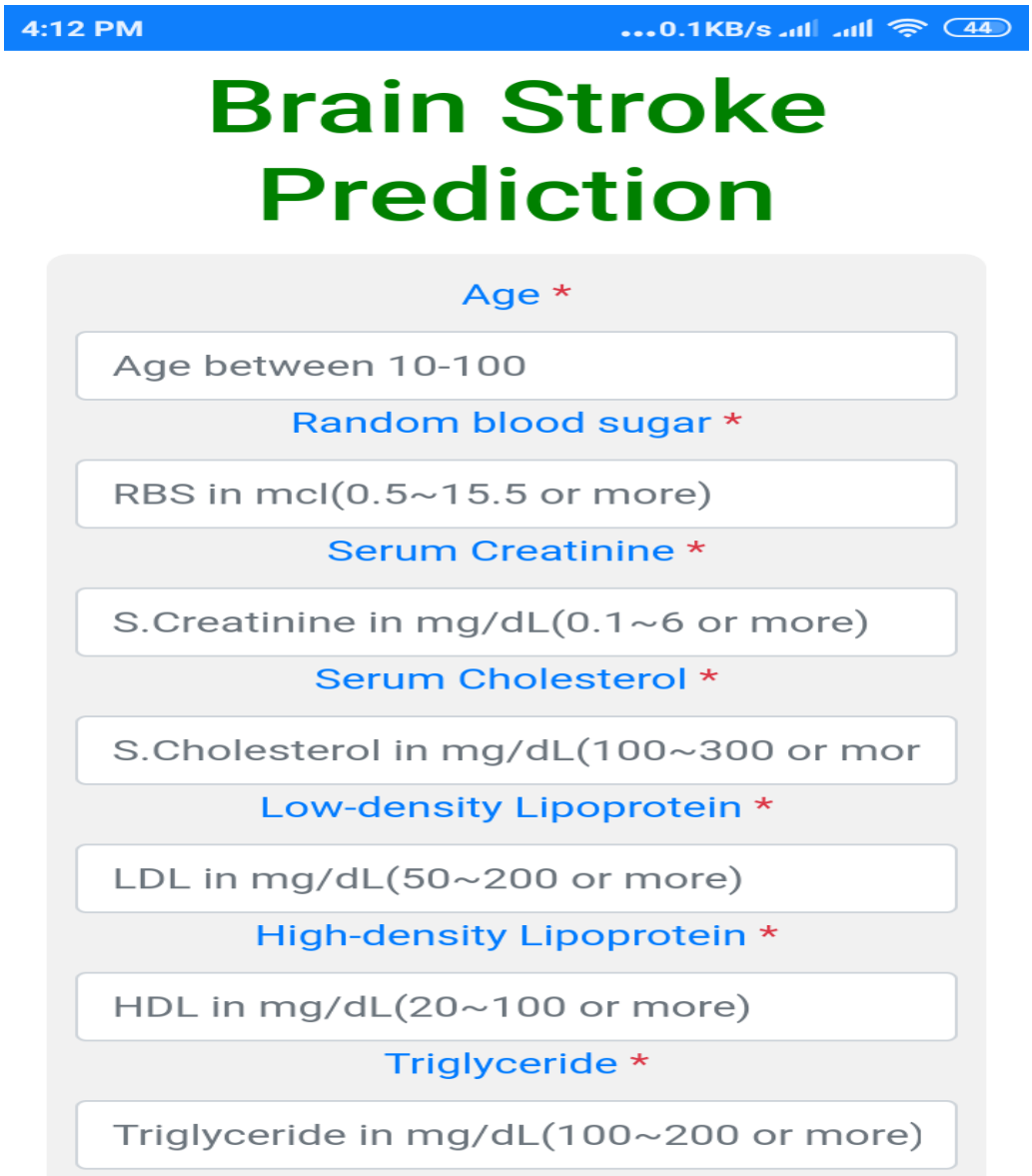


Figure 5.5: Prediction Form

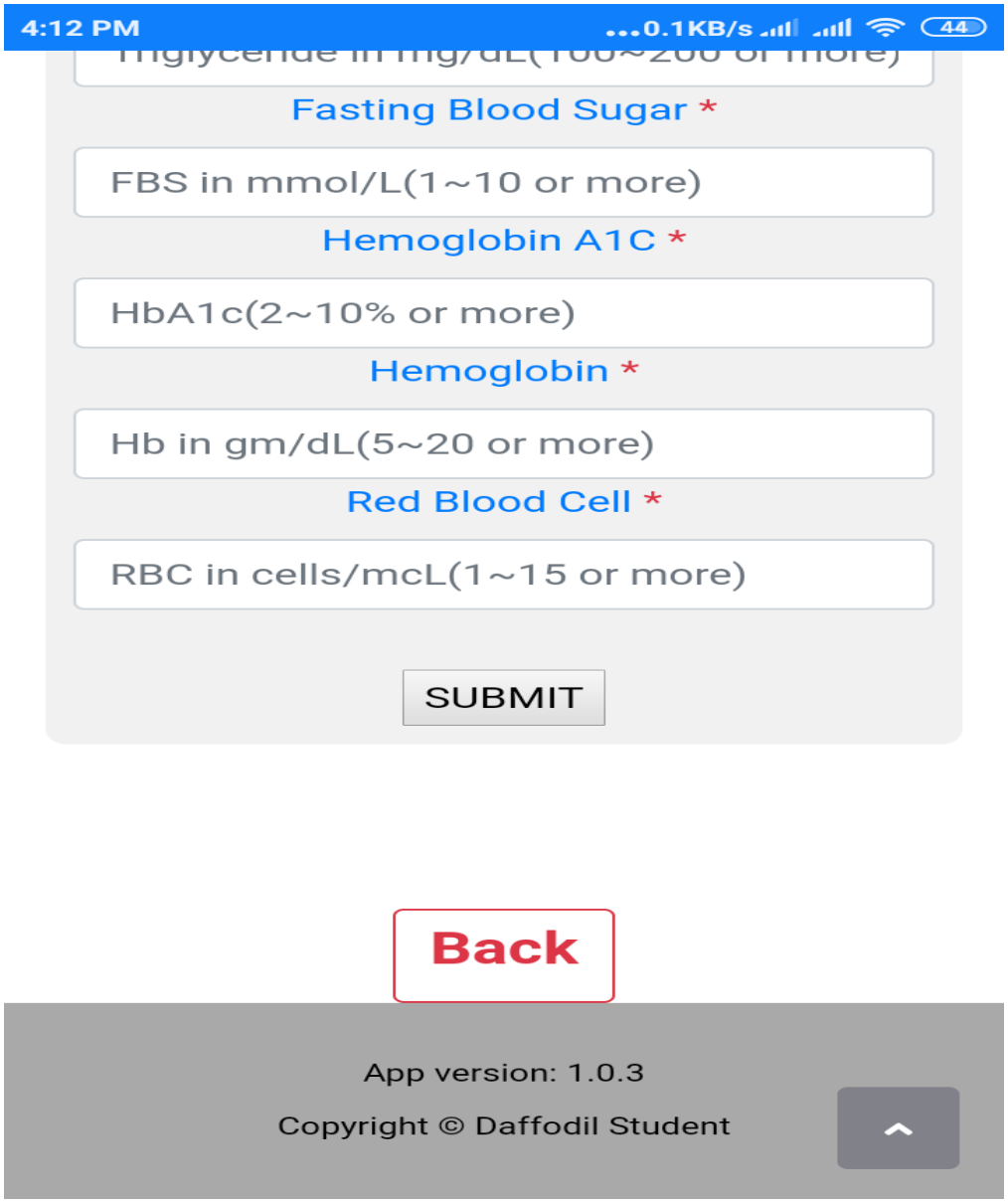


Figure 5.5: Prediction Form

### 5.1.5 Result Page

After clicking submit button u will go next page where you will see the possibility percentage of brain stroke and also a neurologist has been suggested below.

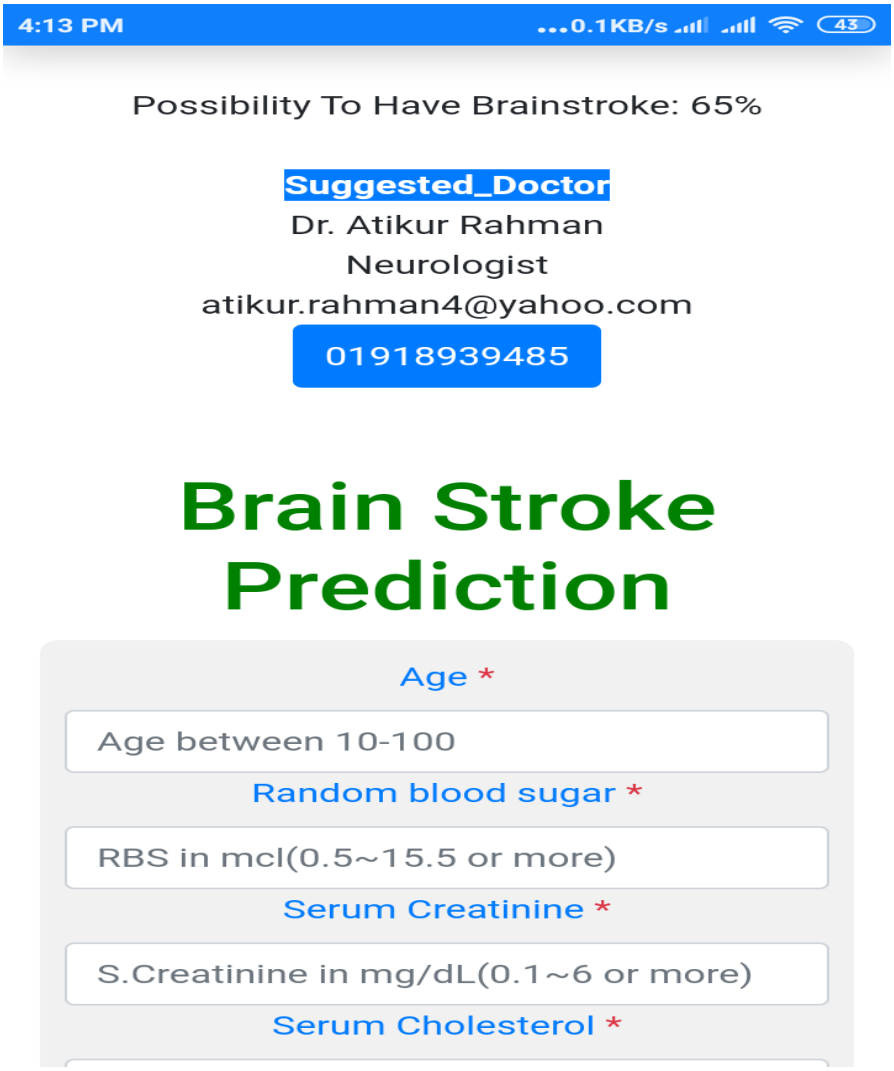


Figure 5.6: Result Page

## 5.2 Implementation of Interactions

A user friendly design of a page and its data pass is very important for a successful application. And beside UI design its UX design is also one of the most important key for an application. We created our application very user friendly so that user can use it very comfortably.

## 5.3 Testing Implementation

Testing is the most important process for assess any system. It is a practical practice for point out any error. Testing is very important for better performance of any application. Application performance will increase and become better than before if we test any system again and again. The features we tasted are given below:

1. Registration.
2. Login.
3. Disease Prediction.
4. Profile Updates.

# CHAPTER 6

# IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

## 6.1 Impact on Society

Our "BRAIN STROKE PREDICTION APPLICATION" is a web based Android application. It can be necessary method for everyone.

The brain stroke is increasing day by day in our society. As a result many people are dying. Through these apps people will be able to know their possibility of brain stroke. And they also get some suggestion. That will be helpful for the people of our society. We are trying to reduce society anxiousness about these disease by this app. It can be able to throw strong positive influence on society. It's also can increase awareness in our society. The people will get suggestion about doctor they should go for treatment.

## 6.2 Impact on the Environment

Our "BRAIN STROKE PREDICTION APPLICATION" application can be conducive for everyone who have the possibility of having brain stroke and need suggestion about doctor they should go for treatment. As this is an application for android device and it's very easy to install for everyone, so, it is totally safe for our environment. There's don't have any bad impression or impact on our life.

## 6.3 Sustainability Plan

Sustainability means how long it will last in the future. It is depends on the projects. Actually that mean is how to confirm the multiplication of application faraway of the posterior. We are trying to give our best to made this necessary and confirm the exorcism of worship in the posterior. Our "BRAIN STROKE PREDICTION APPLICATION" has finished in the long run but our plan is to stay our project influence continue, we are trying to maintain our projects goals and this is our sustainability plan.

# CHAPTER 7

# CONCLUSION AND FUTURE SCOPE

## 7.1 Discussion and Conclusion

At last, by the help of Almighty Allah, the project has been successfully finished. We have been working with this project for extended time. Now, this application is fully ready to exploit. Now, anyone will be able to download it. And they also can be introduce with this app. “BRAIN STROKE PREDICTION APPLICATION” app can be helpful for everyone who have the possibility of having brain stroke and need suggestion about doctor they should go for treatment. We encountered some issues while creating the application. But lastly, we are able to understand them. We also face many problem while making this application. But lastly, by the help of Almighty Allah, we were able to finish the project. We also want to thank our teacher who was by our side, and for his suggestion. In the long run, we can say that this is a complete system and that’ll help everyone. We can hope, this app will be demandable for the incoming future. At last, we are success.

## 7.2 Scope for Further Developments

We tried to give our effort to make this application beneficial to everyone who have the possibility of having brain stroke. In future, the plan for the further developments are given below:

• Bringing more features

• Making simpler

• Improving UI (User Interface)

• Making more Advantageous

• Giving notification

• Building up communication between Doctor and patient.

• Expansion of this service all over the country

7.3 Limitations of this system

Some limitations of this system are given below:

• User must login

• User must registration

# APPENDIX

## Appendix: Task Reflection

The advancement of “Brain Stroke Prediction Application” was a lengthy process to make it visible. We have faced mane difficulties when working with background location permission to execute the principle capacity of our application. The journey of creating this application was fun at the same time it was risky too. We had attempted our best to actualize the application with best Features.

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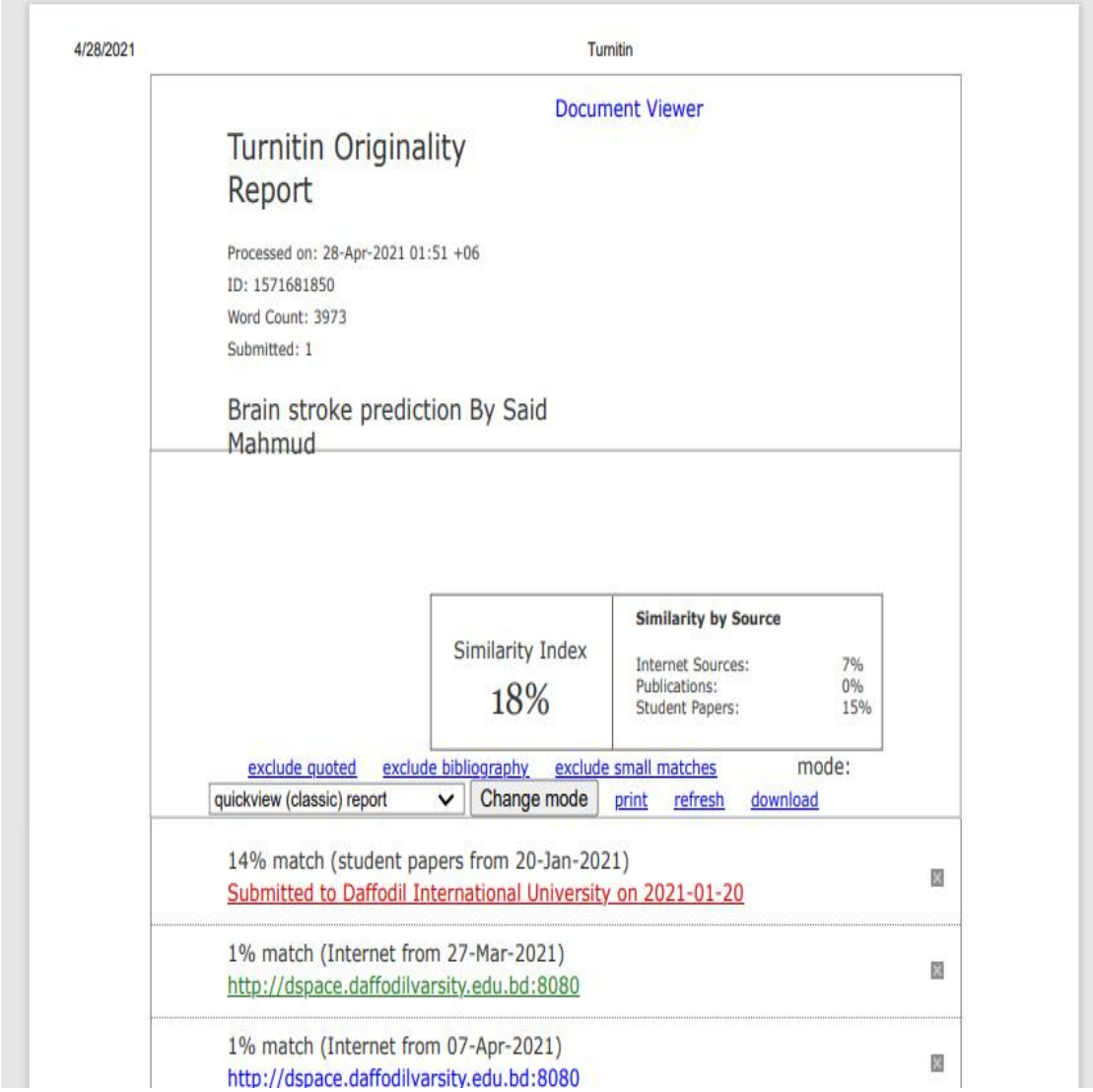

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