Daffodil International University

Citizen Health Information System

Submitted By:

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This **Project** report has been submitted in fulfillment of the requirements for the Degree of Bachelor of Science in Software Engineering.

Department of Software Engineering

Daffodil International University

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APPROVAL

This **Project** titled "**Citizen Health Information System**", submitted by **S.M Tanvir Hossain Antu, ID: 152-35-1289** to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc in Software Engineering and approved as to its style and contents.

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DECLARATION

I hereby declare that, this project has been done by me under the supervision of **Ms. Fatama Binta Rafiq,** Lecturer of Department of Software Engineering at Daffodil International University. I am also declaring that neither this project nor any part of this project has been submitted elsewhere for award of any degree.

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First, I express my heartiest thanks and gratefulness to almighty Allah for His divine blessing for making me possible to complete this project successfully.

I feel grateful to and wish my profound indebtedness to **Ms. Fatama Binta Rafiq**, Lecturer, Department of Software Engineering, Daffodil International University, Dhaka. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stage have made it possible to complete this project.

I would like to thank to the **Square Hospital**, which gives me the idea and motivate me to build such platform for the Doctor and Patient.

Finally, I must acknowledge with due respect the constant support and patients of my parents.

ABSTRACT

Being a human we fall in diseases in our lifetime. In that time we go to Doctor for help, Doctor generally gives us some test and some medicine. We take medicine, test and get well soon. For our future we need to keep that test report and medicine information. Now keeping that test report and medicine information in a safe place is a tough job. If we can keep that information in a safe place there comes another problem it's not available for everywhere and every time. And also in our country we do not have any digital report that which diseases is more Active in our country and which diseases how much that active right now. To solve this problem, I have Create a web platform where patient can save their medical information. In that platform where doctor can easily access and find patient full medical information. Finally we can analyze our full country's health information and create a specific health report about our country.

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Chapter 1 - Introduction

1.1 Project Overview

We human are fall in diseases. In that diseases time we go to Doctor for help, Doctor generally gives us some test and some medicine. We take medicine, test and get well soon. For our future we need to keep that test report and medicine information. Now keeping that test report and medicine information in a safe place is a tough job. If we can keep that information in a safe place there comes another problem it's not available for everywhere and every time. My goal is to create a web platform where patient can save their medical information. In that platform where doctor can easily access and find patient full medical information. Finally we can analyze our full country's health information and create a specific health report about our country.

1.2 Project Purpose

1.2.1 Background

We have no current system in our country but also have some private hospital how store patient diseases information but which is not for government or public accessible and also those are not communicate in one place as a result patient have no track about his full life diseases information which is totally meaningless for store report where patient or other doctor cannot able to access those report.

1.2.2 Benefits & Beneficiaries

When a patient meet with a Doctor and give his email id, then the Doctor send a access request to patient if patient accept this request then Doctor can easily find,

- How many Diseases you have in your lifetime
- How many Medicine you take in lifetime
- How many Doctor you meet in your lifetime
- How many Test Report you have in lifetime
- You're on going diseases information
- Create a specific health report about our full country or specific area.

On the other hand, there is a Moderator how to have a moderator panel where he can see the full report about Diseases info in our country like, how many time a Diseases happen to people. Also ongoing diseases list that active diseases counting.

1.2.3 Goals

Develop a system which will give honest measurement for each patient who will provide right information about diseases. Medical system and doctor will face less to create precipitation and will get a trustful system to make a right decision for a patient. Overall it will be beneficial for whole national medical system and other institutions as well.

1.3 Stakeholders

- **Patient** and **Doctor** are the main stakeholders who will use the app
- **Moderator** update diseases name and monitor diseases status

1.4 Project Schedule

1.4.1 Gantt Chart

Gantt chart shows the timeline of the project's workflow from start to end in the sense of months. Here each steps of the project has been proposed with specific timeline.

Phase	Jul 18	Aug 10	Sep 12	Oct 30	Nov 20
Proposal					
Requirements Collection					
Requirements Analysis					
Software Requirements Specification					
Project Plan					
Implementation					
Testing & Result					

Table 1.4.1 Gantt chart of Citizen Health Information System

1.4.2 Release Plan/Milestone

Here project plan is shown in the table with specific dates.

Phase	Start Date	End Date	Working Days
Proposal	1 July	10 July	5 days
Requirements Collection	20 July	4 August	10 days
Requirements Analysis	7 August	20 August	12 days
Software Requirements Specification	21 August	5 September	15 days
Project Plan	6 September	16 September	10 days
Implementation	16 September	5 November	35 days
Testing & Result	10 November	20 November	7 days
Total	1 July	20 November	94 days

Table 1.4.2 Release Plan/Milestone of Citizen Health Information System

Chapter 2: Software Requirement Specification

After analyzing the requirements of the problematic area based on them a system design and specified required software development process and test plan will be choose.

2.1 Functional Requirements

#	Description	Priority
1	Patient Registration	High
2	Patient Login	High
3	Patient Profile Update	Low
4	Add Diseases with Prescription And Report	High
5	Patient Diseases Status Update	Medium
6	Patient Can Download His Report as PDF	Medium
7	Only Patient Can Give Access Doctor To View Diseases Info	High
8	Doctor Registration	High
9	Doctor Login	High
10	Doctor Profile Update	Medium
11	Search Patient	High
12	Ask Access Code From Patient	High
13	View Patient Diseases List	High
14	Download Patient full Report as a PDF file	Medium
15	Moderator Login	High
16	Add Diseases Name	High
17	Generate Report	High
18	Specific Statistical Analysis Report	Medium

Table 2.1: Functional Requirements

2.2 Data Requirements

#	Description	Priority
1	When patient update something on the app it will updated real time	High
2	Patient must have to fill up all the fields to get the proper benefit	High

Table 2.2: Data Requirements

2.3 Performance Requirements

2.3.1 Speed and Latency Requirements

#	Description	Priority
1	The system should load the data from the server in maximum 15 seconds	Described

Table 2.3.1 Speed and Latency Requirements

2.3.2 Capacity Requirements

#	Description	Priority
1	App should serve 10000 request at a time	High
2	Prescription or report Image size should be less than 1MB	High

Table 2.3.2 Capacity Requirements

2.4 Dependability Requirements

2.4.1 Reliability Requirements

#	Description	Priority
1	App should not crush while patient updating diseases information	High
2	Doctor cannot get access without patient access code	High

Table 2.4.1 Reliability Requirements

2.4.2 Availability Requirements

#	Description	Priority
1	App should work continuously	High
2	The app should show patient and doctor what they want to view	High

Table 2.4.2 Availability Requirements

2.4.3 Robustness or Fault-Tolerance Requirements

#	Description	Priority
1	If app has been crushed it should auto recovered if not, it should not take more than hour	High

Table 2.4.3 Robustness or Fault-Tolerance Requirements

2.4.4 Safety-Critical Requirements

No visible safety-Critical Requirements

2.5 Maintainability and Supportability Requirements

2.5.1 Maintenance Requirements

#	Description	Priority
1	App should have regular maintenance check	Described

Table 2.5.1 Maintenance Requirements

2.5.2 Supportability Requirements

#	Description	Priority
1	The app should support all major web browser and work smoothly	Described

Table 2.5.2 Supportability Requirements

2.5.3 Adaptability Requirements

No visible adaptability requirements

2.5.4 Scalability or Extensibility Requirements

#	Description	Priority
1	The app should support more than 1 million users without any problem	Described

Table 2.5.4 Scalability or Extensibility Requirements

2.6 Security Requirements

2.6.1 Access Requirements

#	Description	Priority
1	Only patient have the rights to access their own details data	Described
2	Only authorized doctor will view patient information	Described

Table 2.6.1 Access Requirements

2.6.2 Integrity Requirements

#	Description	Priority
1	Patient and Doctor data can only modified by themselves	Described

Table 2.6.2 Integrity Requirements

2.6.3 Privacy Requirements

#	Description	Priority
1	Patient’s data will not be used for other purpose other than for the application	Described

Table 2.6.2 Integrity Requirements

2.7 Usability and Human-Interaction Requirements

2.7.1 Ease of Use Requirements

#	Description	Priority
1	Patient and Doctor should be able to use the app by their own without need of any direction	Described

Table 2.7.1 Ease of Use Requirements

2.7.2 Personalization and Internationalization Requirements

No visible Personalization and Internationalization Requirements

2.7.3 Understandability and Politeness Requirements

No visible Understandability and Politeness Requirements

2.7.4 Accessibility Requirements

#	Description	Priority
1	Patient and Doctor should access the app whenever they want	Described

Table 2.7.4 Accessibility Requirements

2.7.5 User Documentation Requirements

No visible User Documentation Requirements

2.7.6 Training Requirements

No visible Training Requirements

2.8 Look and Feel Requirements

2.8.1 Appearance Requirements

#	Description	Priority
1	App user interface should look attractive	Described
2	App user interface must be user friendly	Described
3	App should be self-descriptive	Described

Table 2.8.1 Appearance Requirements

2.8.2 Style Requirements

#	Description	Priority
1	App should look clean and minimal	Described

Table 2.8.2 Style Requirements

2.9 Operational and Environmental Requirements

2.9.1 Expected Physical Environment

No Expected Physical Environment

2.9.2 Requirements for Interfacing with Adjacent Systems

No Requirements for Interfacing with Adjacent Systems

2.9.3 Projectization Requirements

No Projectization Requirements

2.9.4 Release Requirements

#	Description	Priority
1	App should have specific version for each release	Described

Table 2.9.4 Release Requirements

2.10. Legal Requirements

2.10.1 Compliance Requirements

#	Description	Priority
1	The patient and doctor must be aware of the usage of their data which scope is only limited to the application	Described

Table 2.10.1 Compliance Requirements

2.10.2 Standards Requirements

No Standards Requirement

Chapter 3: System Analysis

3.1 Use Case Diagram

In this app there is three actor.

- Patient
- Doctor
- Moderator

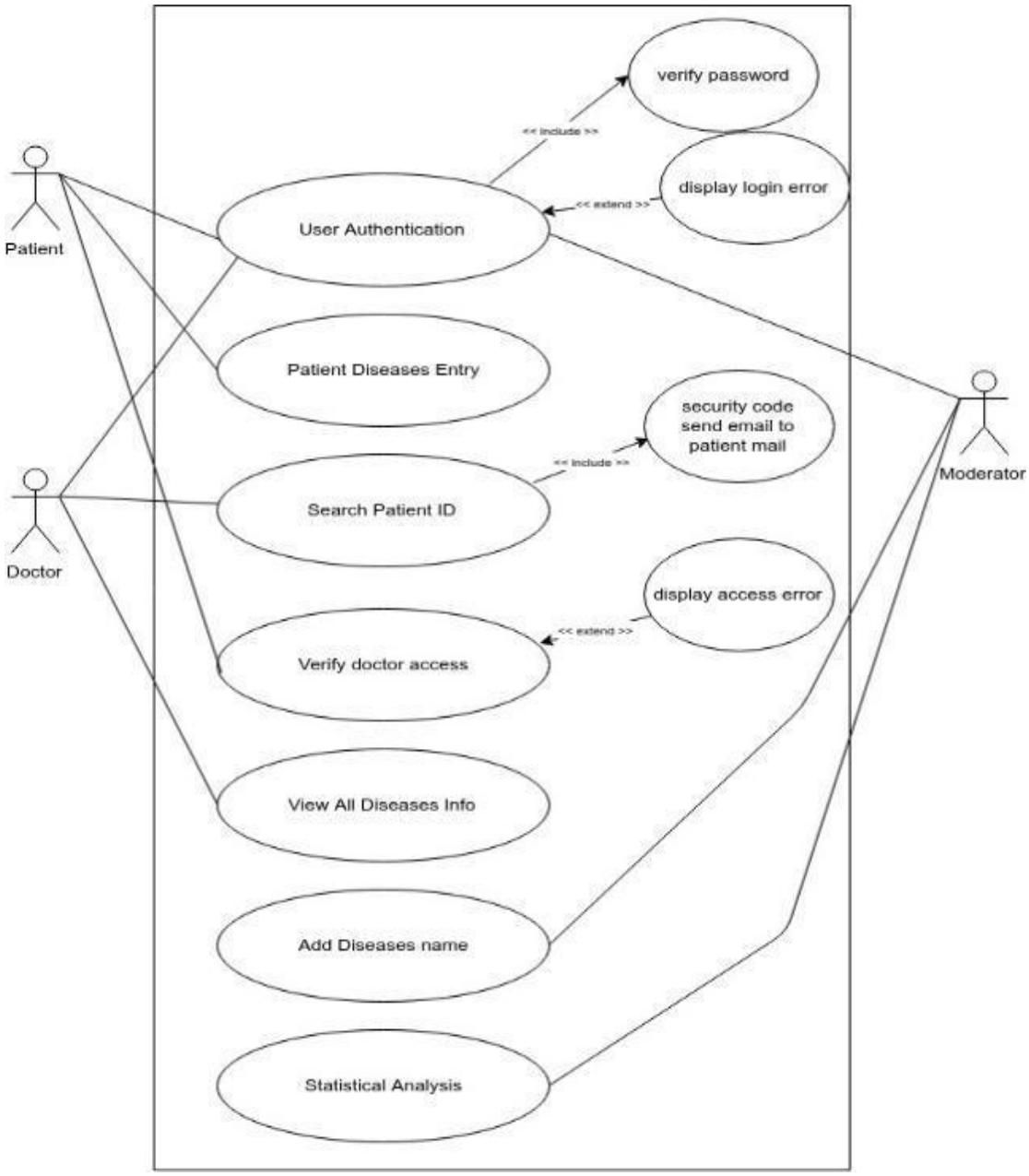

Figure 3.1 Use Case Diagram of Citizen Health Information System

3.2 Use Case Description

Use case description gives an idea of how each of the use case of the application will work and what it will do in the project. Below use case descriptions are given in table format.

3.2.1 User Authentication

Title	User Authentication
Goal	Patient, Doctor, Moderator login
Preconditions	Must have to be register user
Primary Actor	Patient, Doctor, Moderator
Secondary Actor	N/A
Trigger	N/A
Description	Each actor must have to register user

Table 3.2.1 Log in

3.2.2 Patient Diseases Entry

Title	Patient Diseases Entry
Goal	Patient Diseases Information Entry
Preconditions	Must have to login
Primary Actor	Patient
Secondary Actor	N/A
Trigger	N/A
Description	Patient will entry his full diseases information

Table 3.2.2 Registration

3.2.3 Search Patient ID

Title	Search Patient ID
Goal	Find Patient By Searching ID

Preconditions	Must have to login
Primary Actor	Doctor
Secondary Actor	N/A
Trigger	N/A
Description	Search Patient for view full life diseases information

Table 3.2.3 Password Reset

3.2.4 Verify Doctor Access

Title	Verify Doctor Access
Goal	Stop Unauthorized access
Preconditions	Must have to login and have access code
Primary Actor	Doctor
Secondary Actor	N/A
Trigger	N/A
Description	Only authorized doctor will visit patient full diseases information

Table 3.2.4 Update Profile

3.2.5 View All Diseases Info

Title	View All Diseases Info
Goal	View Patient Diseases Info
Preconditions	Must have to login and have access code
Primary Actor	Student
Secondary Actor	N/A
Trigger	N/A
Description	View patient full diseases information

Table 3.2.5 View Dashboard

3.2.6 Add Diseases Name

Title	Add Diseases Name
Goal	In list Diseases Name Into System
Preconditions	Must have to login
Primary Actor	Moderator
Secondary Actor	N/A
Trigger	N/A
Description	Moderator will list down all diseases name into system

Table 3.2.6 View Recommendation

3.2.7 Statistical Analysis

Title	Statistical Analysis
Goal	View all the report
Preconditions	Must have to login
Primary Actor	Moderator
Secondary Actor	N/A
Trigger	N/A
Description	See statistical diseases report

Table 3.2.7 Statistical Analysis

3.3 Activity Diagram

An Activity Diagram gives an overview of the activities in the application. Below an Activity Diagram is drawn to give an overview of my application.

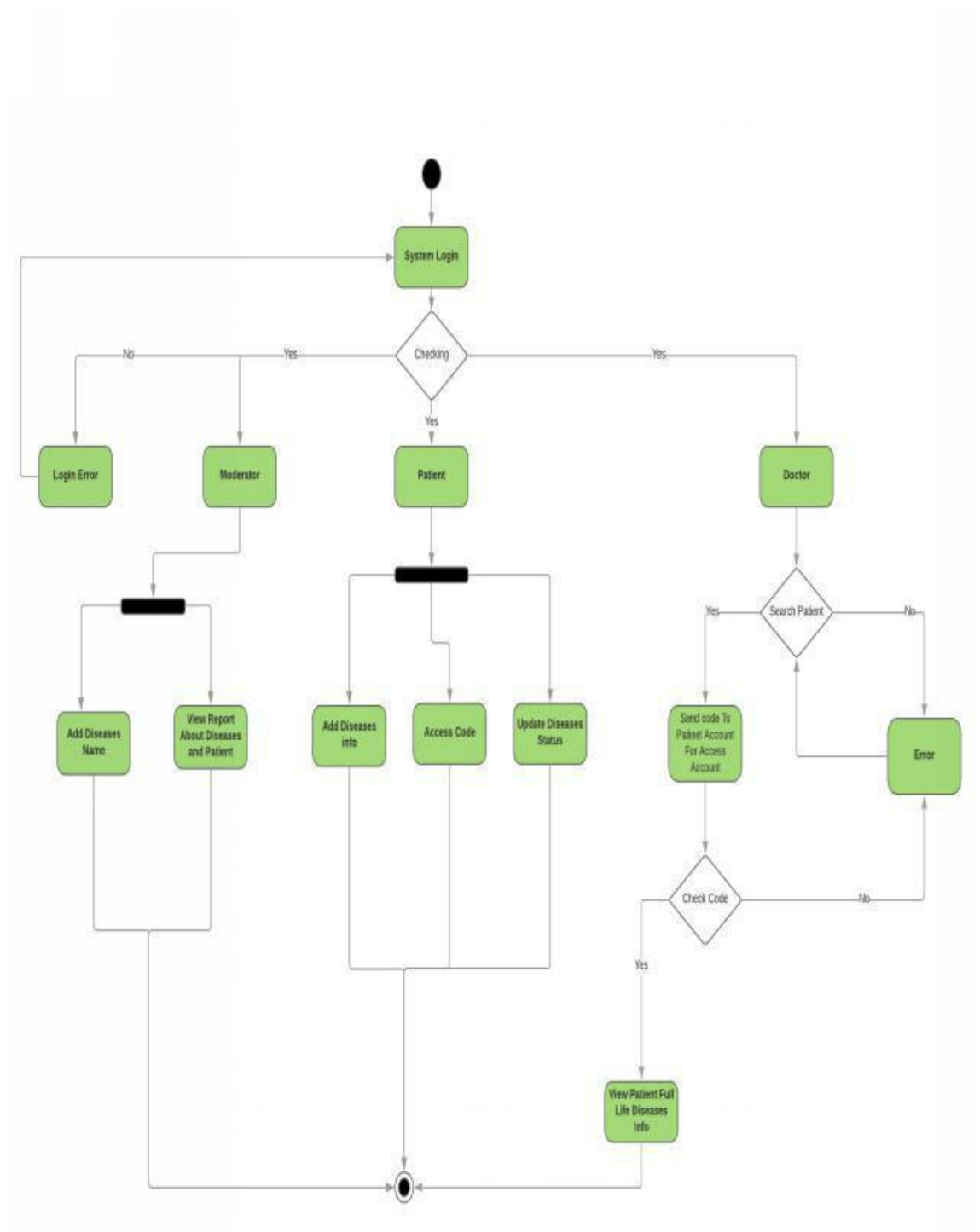

Figure 3.3: Activity Diagram of Citizen Health Information System

3.4 System Sequence Diagram

System Sequence Diagram shows the data flow throughout the application. Below a System sequence diagram is drawn for my project.

Patient:

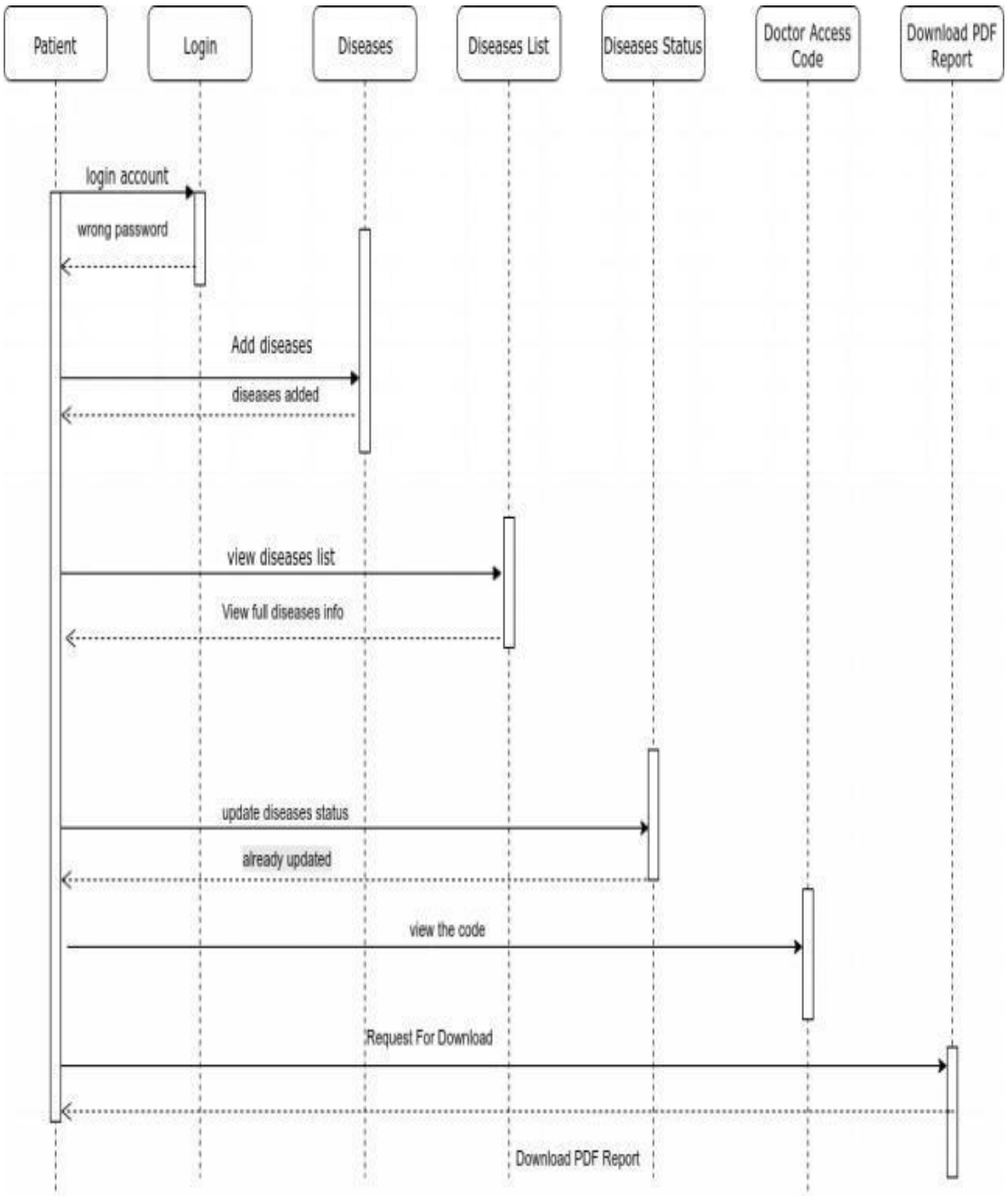

Figure 3.4.1: System Sequence Diagram of Citizen Health Information System

Doctor:

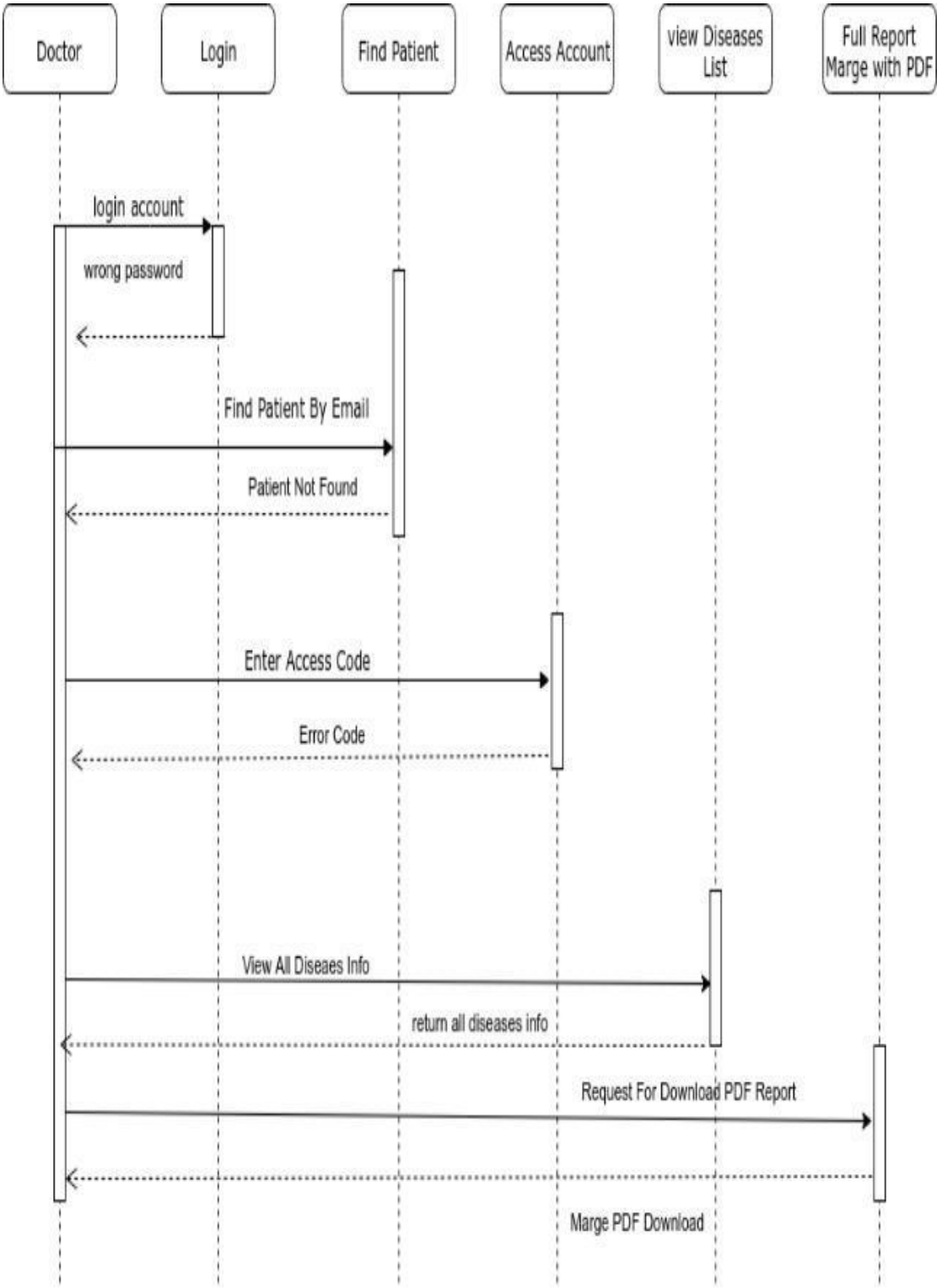

Figure 3.4.2: System Sequence Diagram of Citizen Health Information System

Moderator:

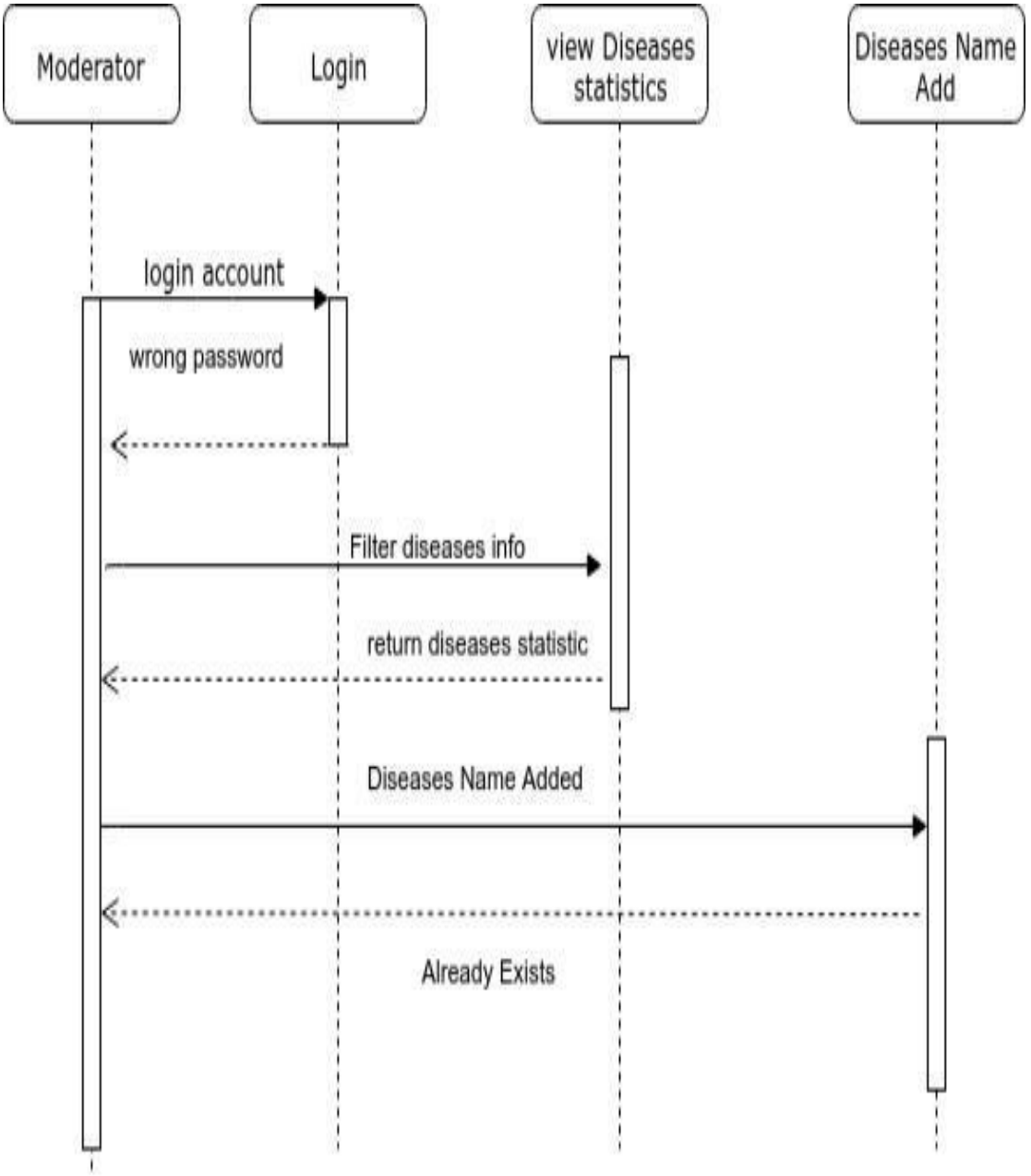

Figure 3.4.3: System Sequence Diagram of Citizen Health Information System

Chapter 4: System Design Specification

4.1 Class Diagram

In my application there are some classes which have various methods and properties. I have given an overview of my functional classes in a class diagram design format.

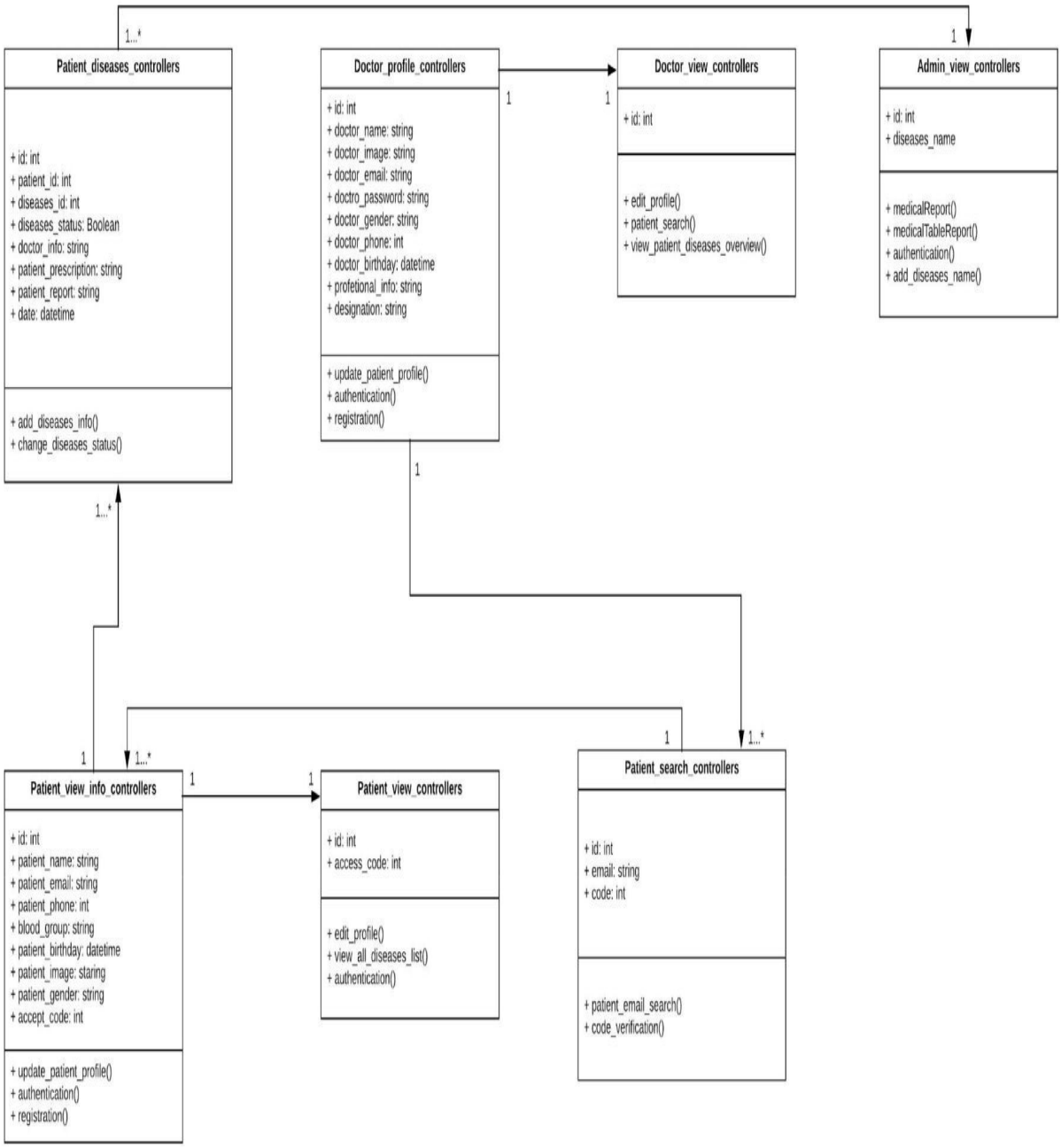

Figure 4.1: Class Diagram of Citizen Health Information System

4.2 Database Design Diagram

Database design shows the database of my application. Below my database tables with the attributes are given.

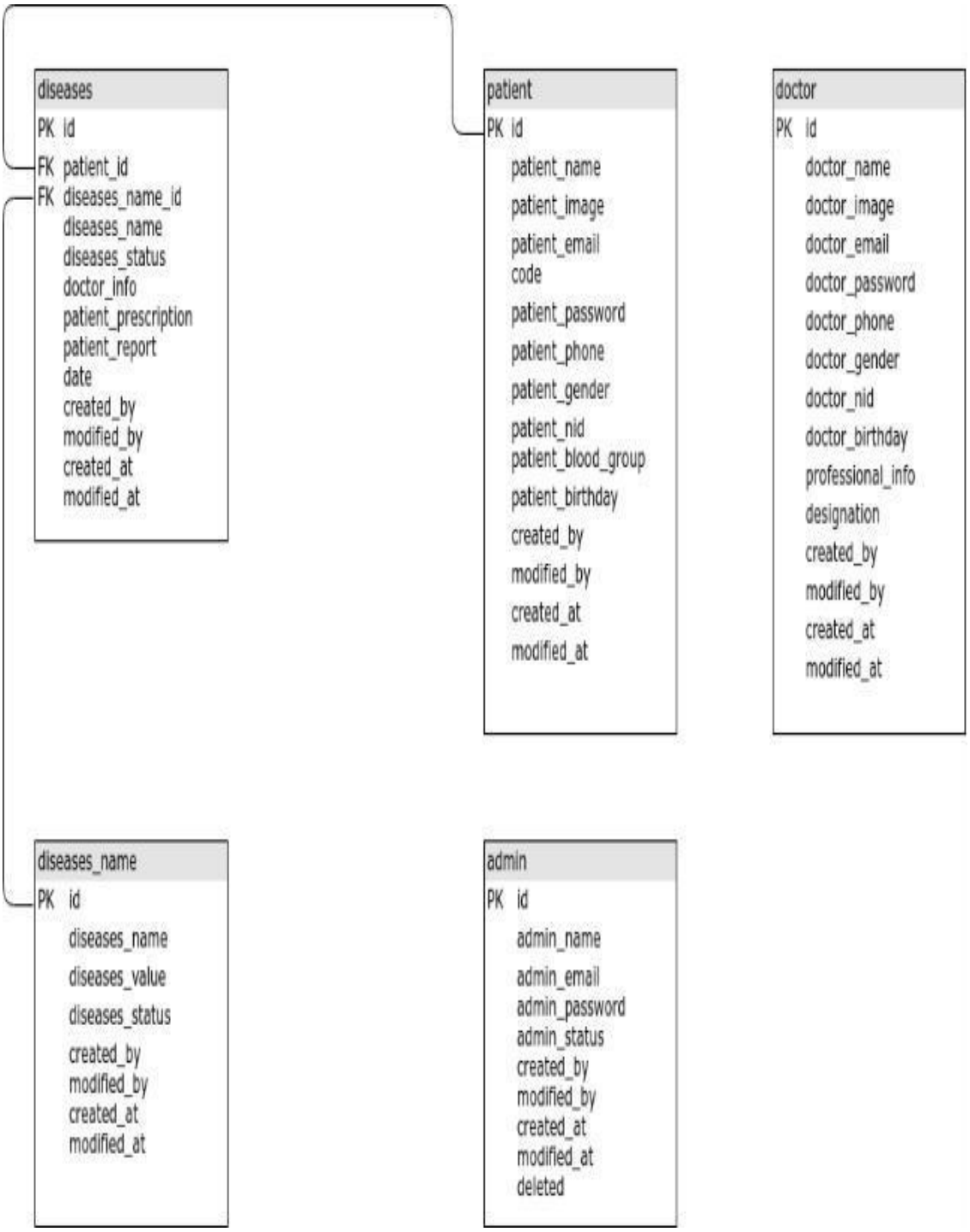

Figure 4.2: Database Design Diagram of Citizen Health Information System

4.3 Development Tools & Technology

4.3.1 Frontend Language & Libraries

- HTML
- CSS
- Bootstrap
- Font Awesome
- JavaScript with jQuery

4.3.2 Backend

- PHP with Codeigniter
- Mysql

4.3.3 Implementation Tools & Platforms

- Visual Studio Code
- Adminer (GUI tools to browse database)

4.3.4 Version Control System

- Github with Git

Chapter 5: System Testing

5.1 Introduction

Without testing it is not possible to trust the system functionality if it works properly or not. We will test the system that has been already built by following testing rules. Every parts of the system will be tested.

5.1.1 Black Box Testing

In Unit testing, here all the system units will be tested according to the test case and if it does not match the expected result, further action will be taken to fix the problem.

- **Patient:**

No	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Pass / Fail
01	Login (valid data)	1. Go to patient login url 2. Enter email and password 3. Click Submit	antu@gmail.com & antu	Logged In	As Expected	Pass
02	Login (Invalid data)	1. Go to patient login url 2. Enter email and password 3. Click Submit	test@gmail.com & test	Not logged In	As Expected	Pass
03	Patient related URL check without login	Try to browse any patient related URL	Cannot browse any URL and redirect to Login page.		As Expected	Pass
04	Registration	1. Go to patient registration url 2. Enter email, name, phone no,	test@gmail.com & test & 01547475557 , test, male	Registration successfully	As Expected	Pass

		password, gender 3. Click Submit				
05	Registration Same Email	1. Go to patient registration url 2. Enter email, name, phone no, password, gender 3. Click Submit	test@gmail.com & test & 01547475557 , test, male	Email Already Exist	As Expected	Pass
06	Update patient account	1. Click on update profile 2. Enter name, phone, nid, birthday, blood group, password, update profile pic 3. Click Submit	Mr. Antu & 5412412547 85217 & 09-07-1994, B+, antu, antu.jpg	Information update successfully	As Expected	Pass
07	Add Diseases Info	1. Click on Add Diseases info 2. Select diseases name, diseases status, meet doc name, date, prescription, report	Malaria & I already have this diseases & dummy doc name and info & 11-11-2018 & prescription.jpg & report.jpg	Information Save Successfully	As Expected	Pass
08	View All Diseases List	1. Click on view all diseases list		All Information view successfully	As Expected	Pass
09	View Doctor info, prescription,	1. Click on doctor info, prescription and report		All Information view successfully	As Expected	Pass

	report					
10	Download PDF Prescription and report	1. Go to view prescription and click on download pdf		Prescription Download as a pdf file	As Expected	Pass
11	Update diseases status	1. Click on update diseases status		Update diseases status	As Expected	Pass
12	Log out	1.Click on Logout button		Log out successfully	As Expected	Pass

Table 5.1.1.1 Features to be tested for Patient

- **Doctor**

No	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Pass / Fail
01	Login (valid data)	4. Go to doctor login url 5. Enter email and password 6. Click Submit	tanvir@gmail.com & antu	Logged In	As Expected	Pass
02	Login (Invalid data)	1. Go to doctor login url 2. Enter email and password 3. Click Submit	test@gmail.com & test	Not logged In	As Expected	Pass
03	Doctor related URL check	Try to browse any doctor related URL	Cannot browse any URL and	Not Authorize	As Expected	Pass

	without login		redirect to Login page.			
04	Registration	4. Go to doctor registration url 5. Enter email, name, phone no, password, gender 6. Click Submit	test@gmail.com & test & 01547475557 , test, male	Registration successfully	As Expected	Pass
05	Registration Same Email	3. Go to doctor registration url 4. Enter email, name, phone no, password, gender 3. Click Submit	test@gmail.com & test & 01547475557 , test, male	Email Already Exist	As Expected	Pass
06	Update Profile	1. Go to update doctor profile 2. Enter name, phone no, nid, Birthday, designation, Professional Information, password, profile pic	Test & 01547447887 & 2154785478 2522 & Professor Of Neurosurgery & MBBS, MS (Surgery) & doc.jpg	Update Successfully	As Expected	Pass
07	Search Patient	1. Click on search patient 2. Enter patient email id 3. submit	antu@gmail.com	Find Patient	As Expected	Pass
08	Search patient with not register patient email id	1. Click on search patient 2. Enter Email id 3. Submit	Testing@gmail.com	Not find patient	As Expected	Pass

09	Enter patient access code	1. Go to search patient id login and get code 2. Enter code 3. Submit	5214	Access Successfully	As Expected	Pass
10	Enter patient wrong assess code	1. Enter wrong code 2. Submit	2475	Not Access	As Expected	Pass
11	Try to hit url to view patient diseases information	1. Hit any patient diseases view url		Not Access	As Expected	Pass
12	Every search code getting new	1. Search patient again 2. submit	5214	Not access	As Expected	Pass
13	View Patient info	1. View all patient info		Access Into the disease all list	As Expected	Pass
14.	View Doctor info	1. View patient meet doctor info 2. click		View doctor info	As Expected	Pass
15	View prescription & report	1. Hit view prescription button 2. Hit view report button		View prescription & report	As Expected	Pass
16	Download Full Prescription as a PDF file	1. Click on download full prescription pfd button		Download full prescription in a marge file	As Expected	Pass

17	Download Full Report as a PDF file	1. Click on download full report pfd button		Download full report in a marge file	As Expected	Pass
18	Log out	1. Click on logout button		Successfully Logout	As Expected	Pass

Table 5.1.1.2 Features to be tested for Doctor

- **Moderator:**

No	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Pass / Fail
01	Login (valid data)	1Go to moderator login url 2. Enter email and password 3. Click Submit	admin@gmail.com & admin	Logged In	As Expected	Pass
02	Login (Invalid data)	1. Go to Admin login url 2. Enter email and password 3. Click Submit	test@gmail.com & test	Not logged In	As Expected	Pass
03	Admin related URL check without login	Try to browse any Admin related URL	Cannot browse any URL and redirect to Login page.	Not Authorize	As Expected	Pass
04	Add Diseases name	1. Click on add diseases name	HIV	Diseases Name Added	As Expected	Pass

05	View Disease report	1. Click on view report	View All diseases status and report		As Expected	Pass
05	Logout	1. Click on logout button		Successfully Logout	As Expected	Pass

Table 5.1.1.3 Features to be tested for Moderator

Chapter 6: User Manual

6.1 User Manual (Patient, Doctor, Moderator)

6.1.1 Home Page

This is the home page visitor will see if the come first.

Figure 6.1.1: Home Page

6.1.2 Sign up Page

Patient will be able to sign up from this page.

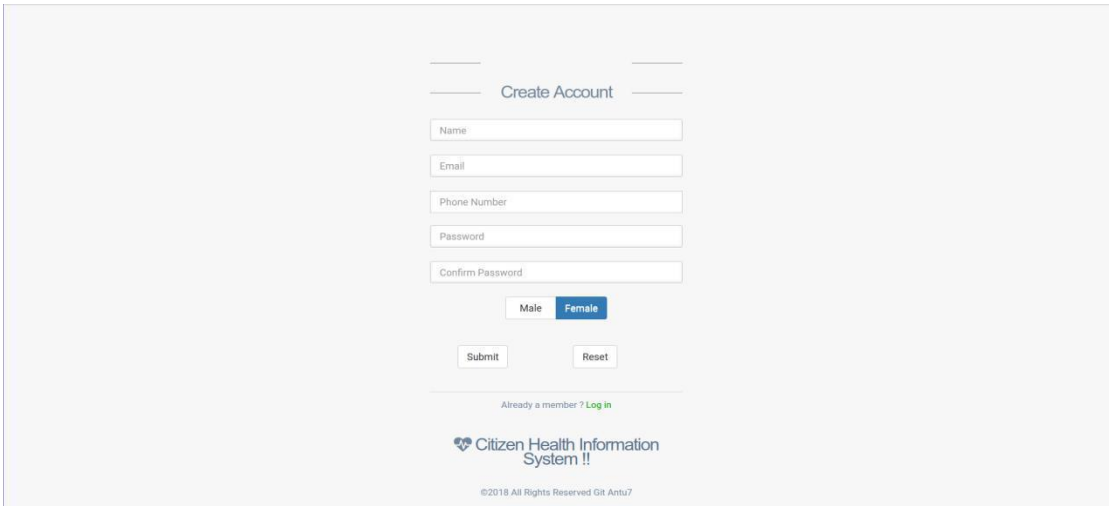

Figure 6.1.2: Sign up Page (patient)

6.1.3 Login Page

Login Page to login the application by registered patient

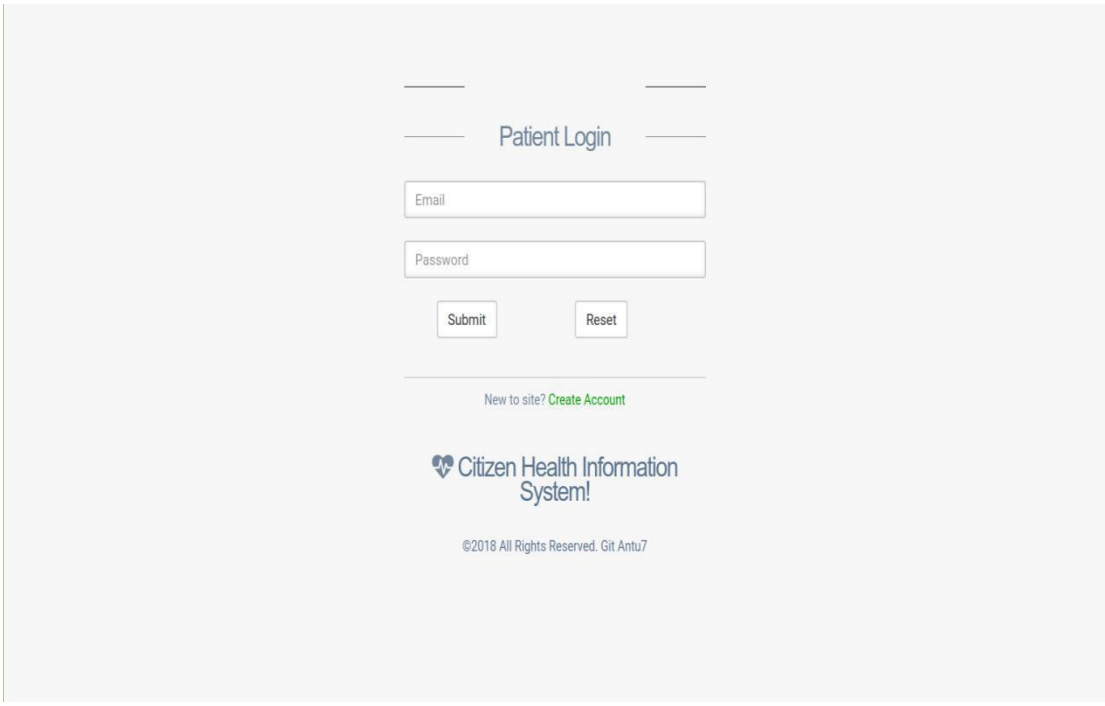

Figure 6.1.3: Login Page (For Patient)

6.1.4 Patient Dashboard

After successful login patient will view this dashboard page.

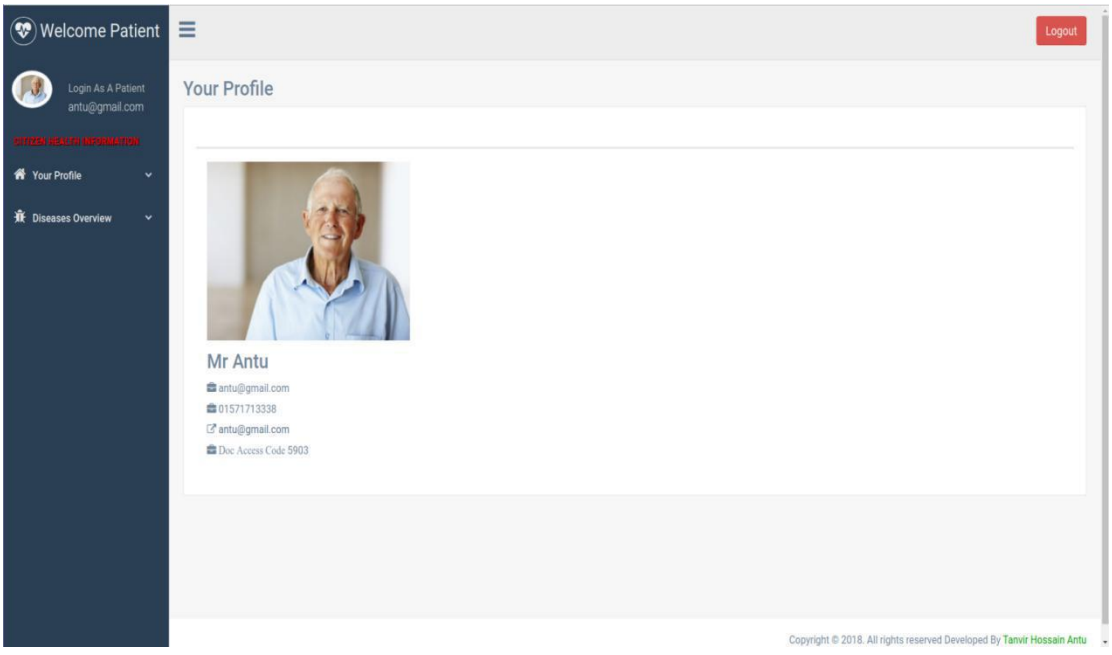

Figure 6.1.4: Patient dashboard

6.1.5 Patient Update Profile

Patient will able to update his profile from here.

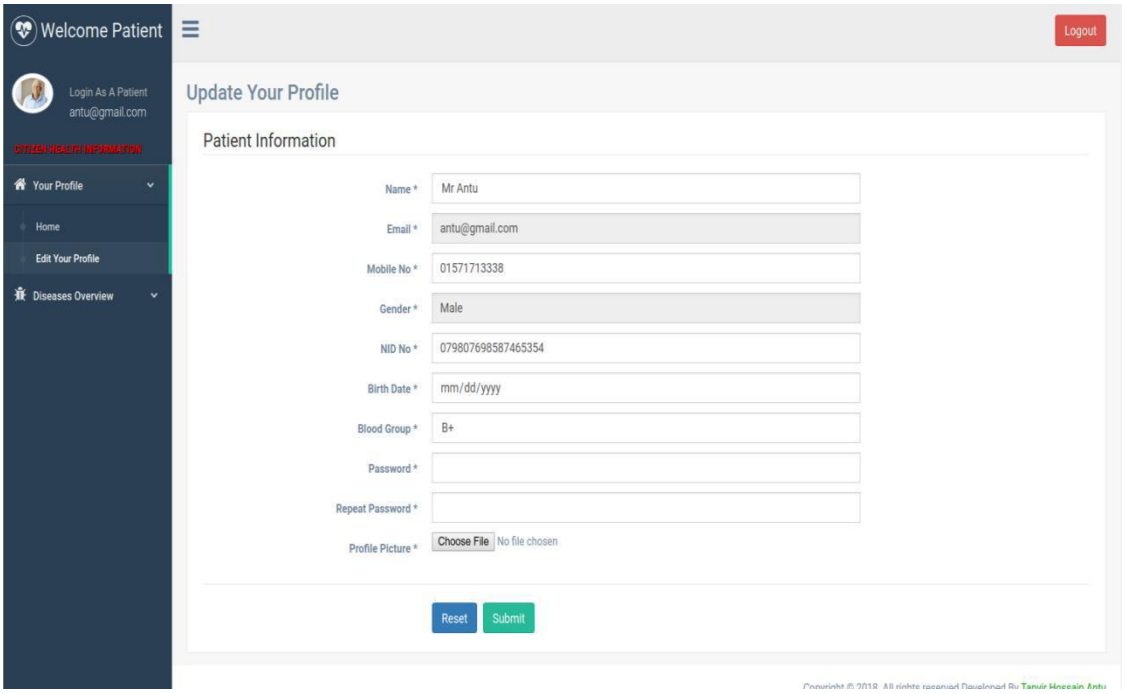

Figure 6.1.5: Patient update profile

6.1.6 Patient Diseases Update Page

This is the main page where patient will able to add his diseases information correctly.

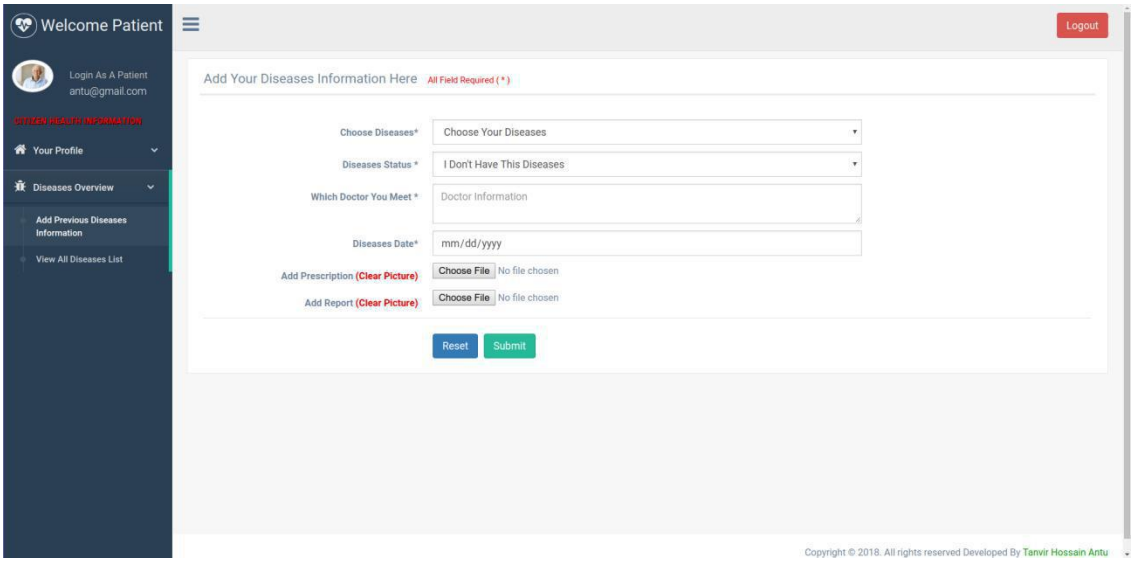

Figure 6.1.6: Patient diseases add Page

6.1.7 Patient Diseases List View

After add diseases information patient will able to view his full life diseases information in this page.

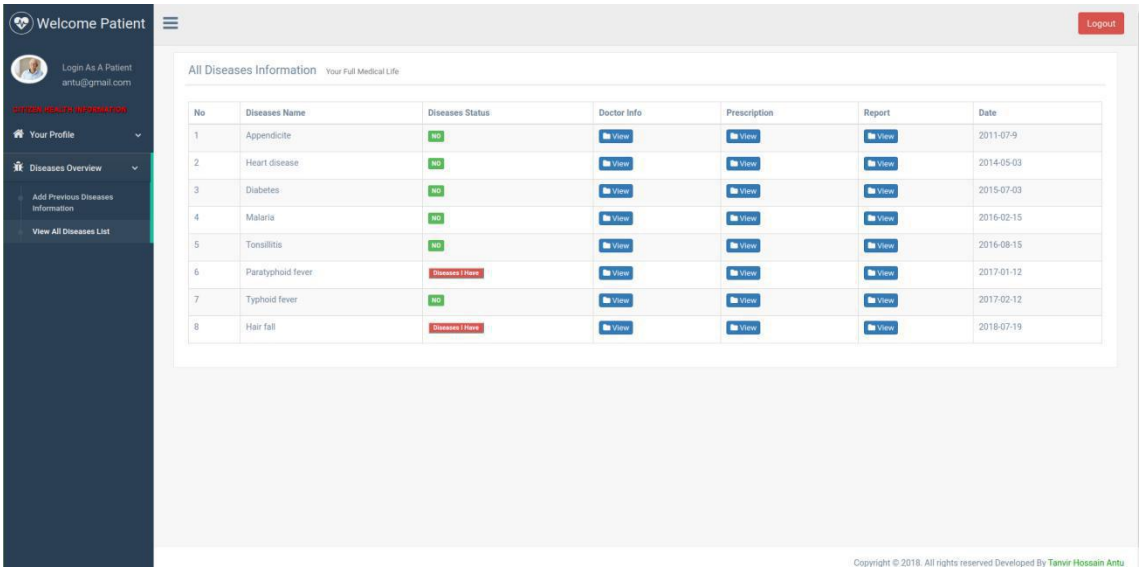

Figure 6.1.7: Patient Diseases List View

6.1.8 Patient Prescription View

Patient will able to view his prescription image also able to download as a pdf file

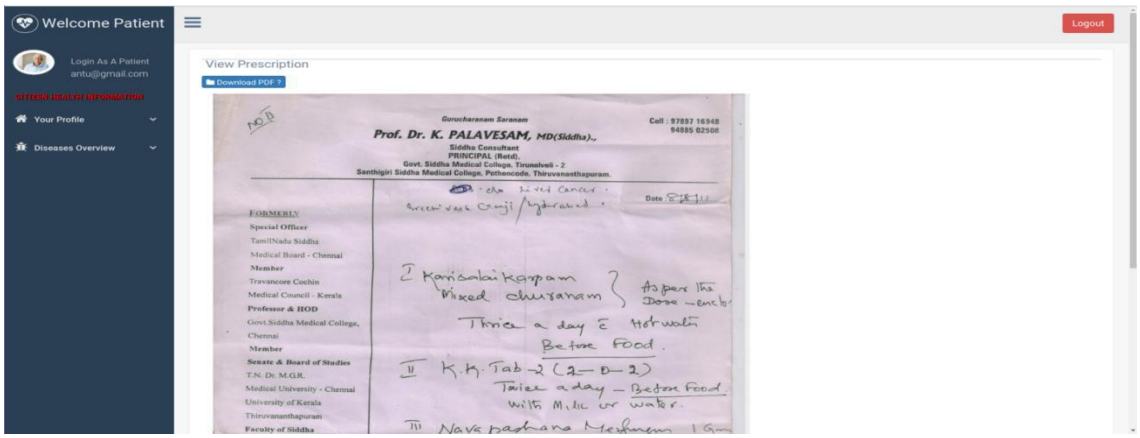

Figure6.1.8: Patient Diseases Image View

6.1.9 Doctor Login

Doctor will able to login from here and also can register for new doctor form here

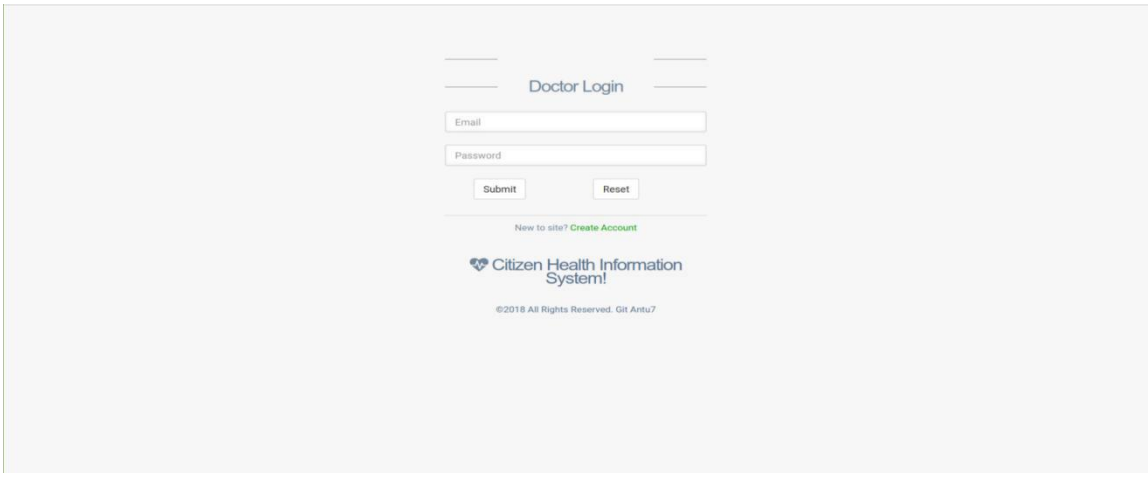

Figure 6.1.9: Doctor Login

6.1.10 Doctor Dashboard

After successful login doctor will view this dashboard page.

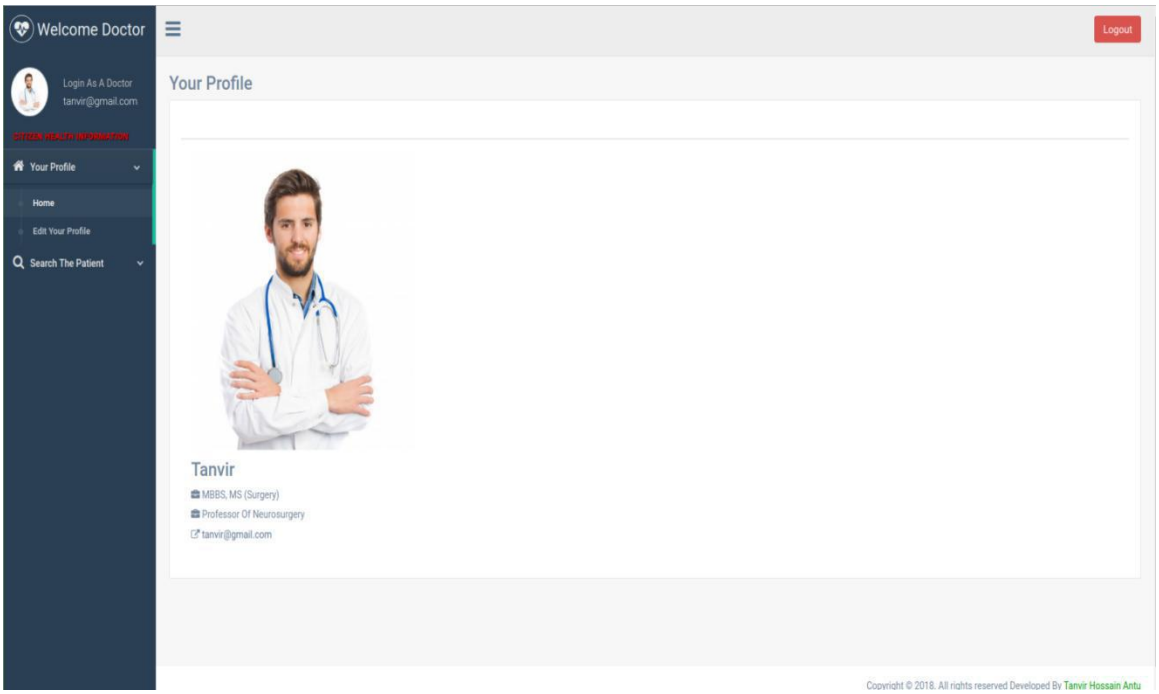

Figure 6.1.10: Doctor Dashboard

6.1.11 Doctor Update Profile

After success full login doctor will about to update his profile.

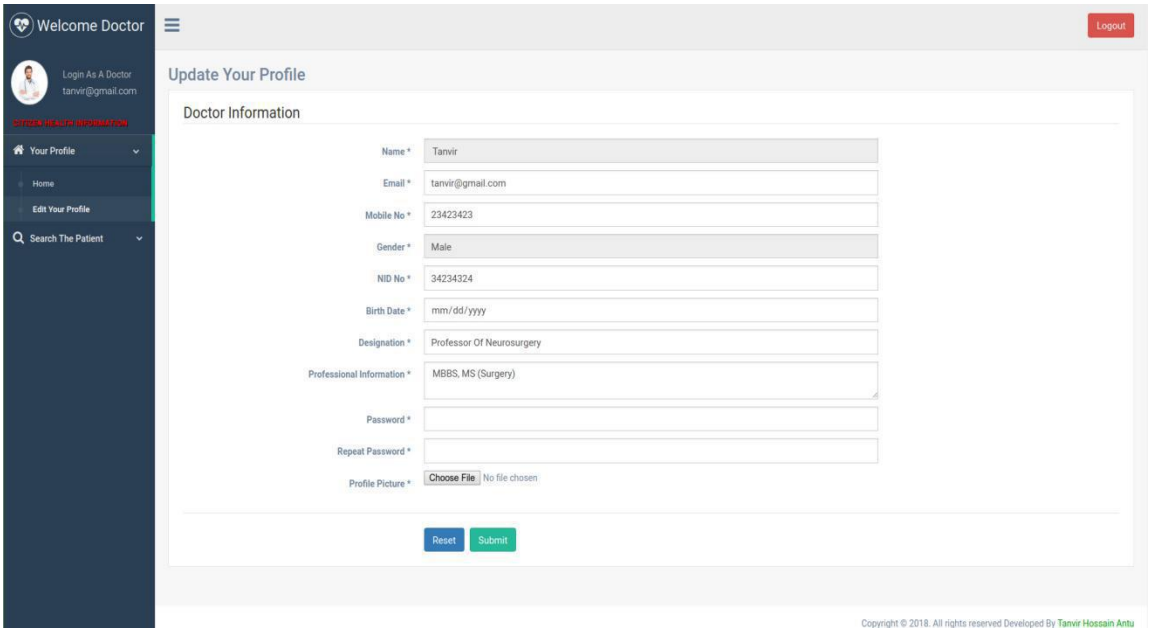

Figure 6.1.11: Doctor Update Profile

6.1.12 Doctor Search Patient

In this page doctor can search patient by patient email address.

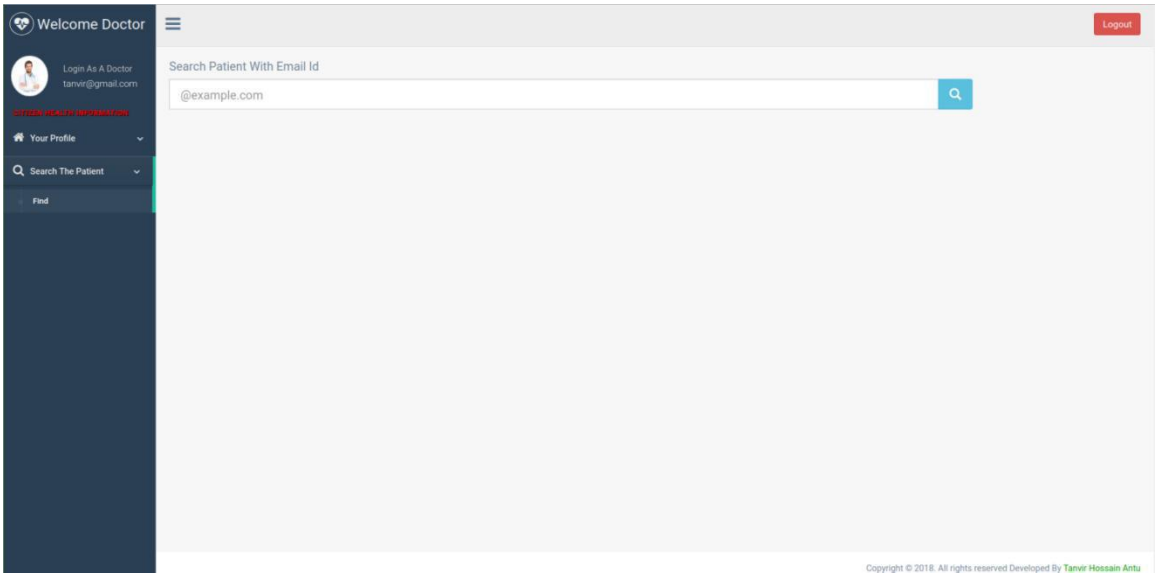

Figure 6.1.12: Doctor Search Patient

6.1.13 Get Patient

Doctor get search patient.

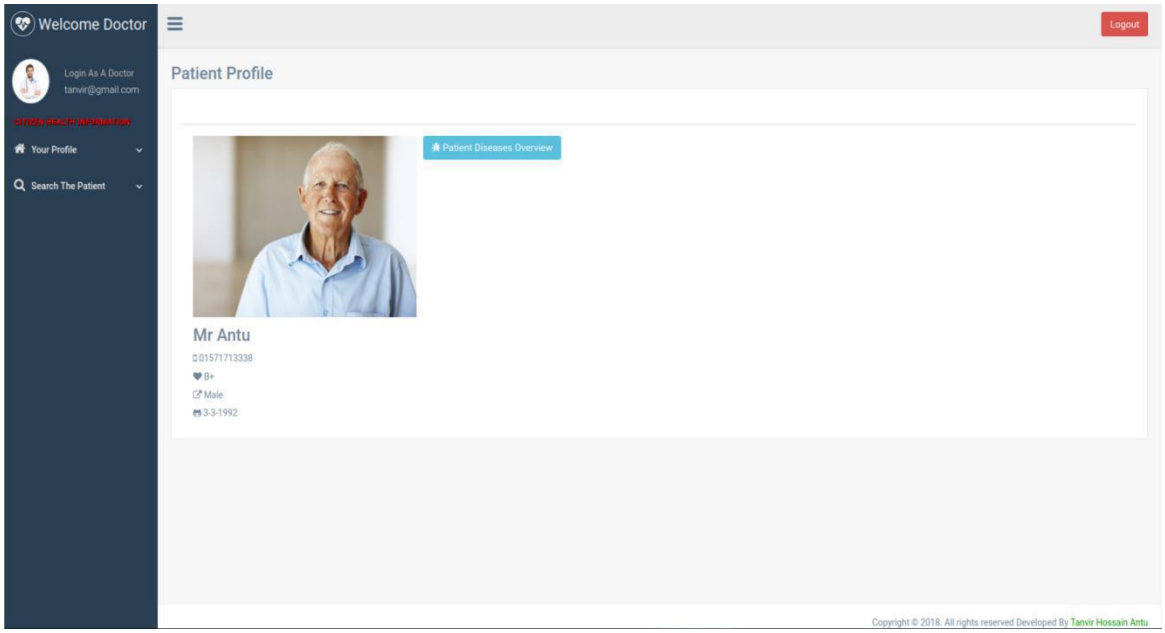

Figure 6.1.13: Doctor Get Patient

6.1.14 Ask For Access Code

Doctor ask patient for access code and only proper code will give doctor to access.

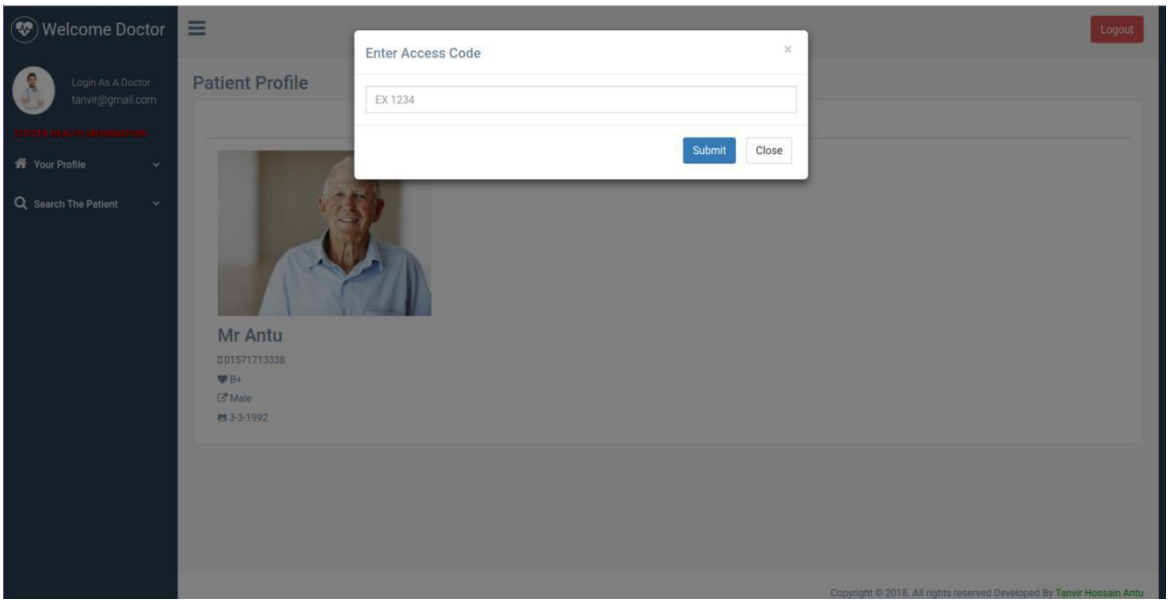

Figure 6.1.14: Doctor Ask Access Code

6.1.15 Doctor Patient Disease List

Doctor will able to view patient full life diseases list

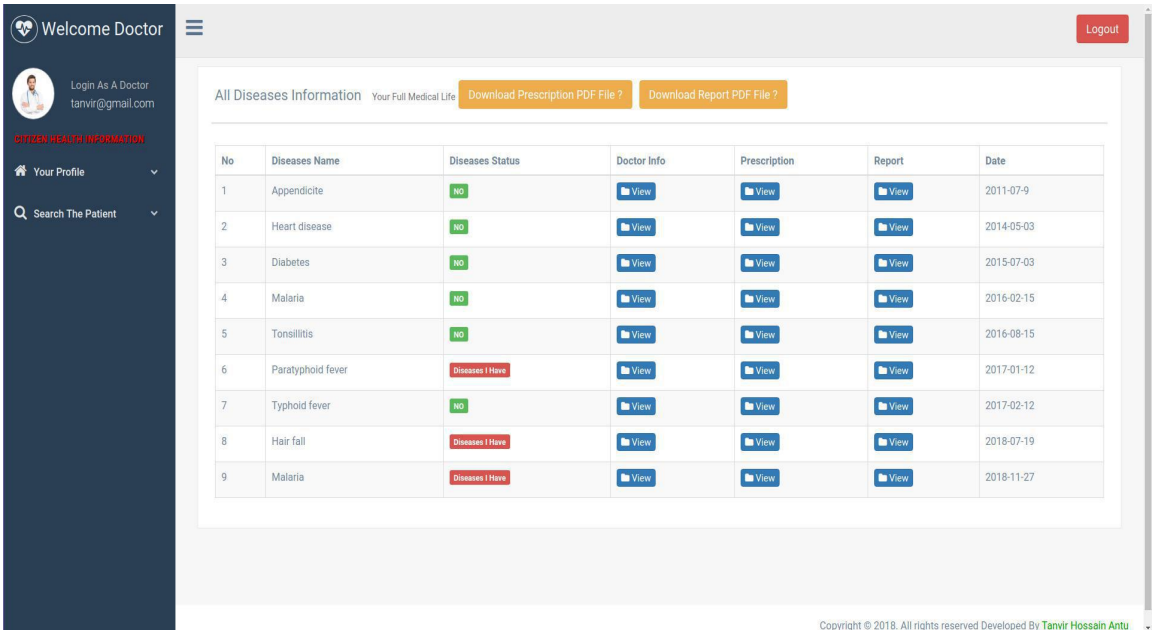

Figure 6.1.15: Patient Diseases List

6.1.16 Doctor Patient Prescription view

Doctor will able to view patient full life diseases list and also view prescription.

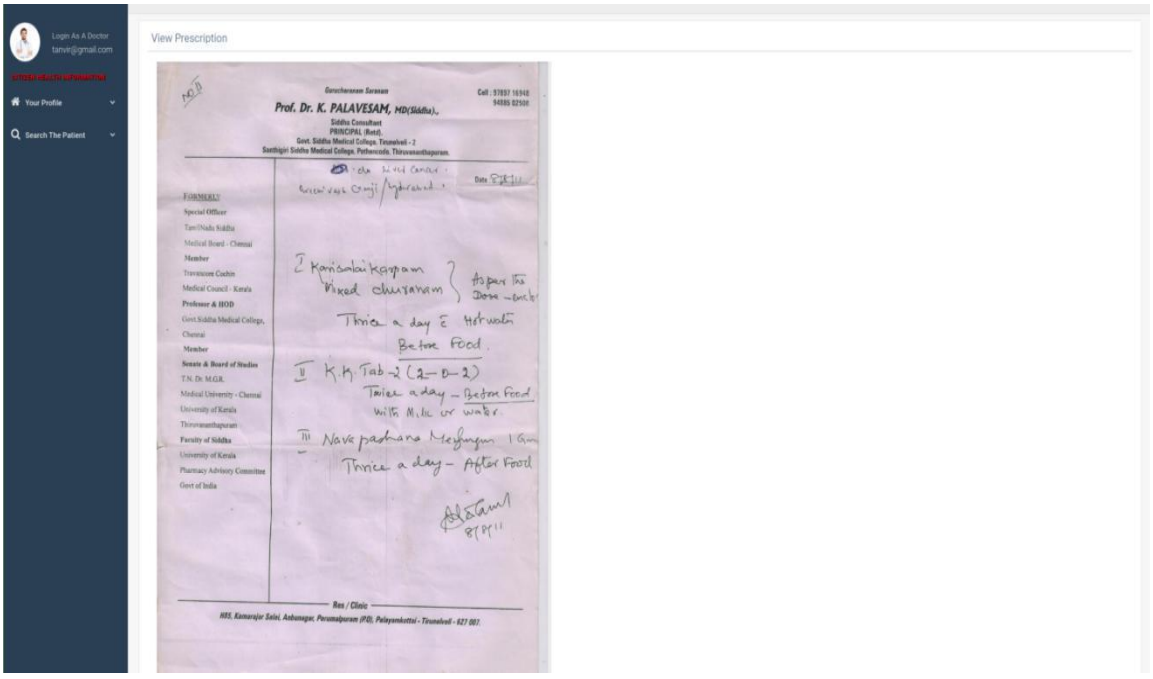

Figure 6.1.16: Patient Prescription View

6.1.17 Login Page Moderator

Login Page to login the application by registered Moderator

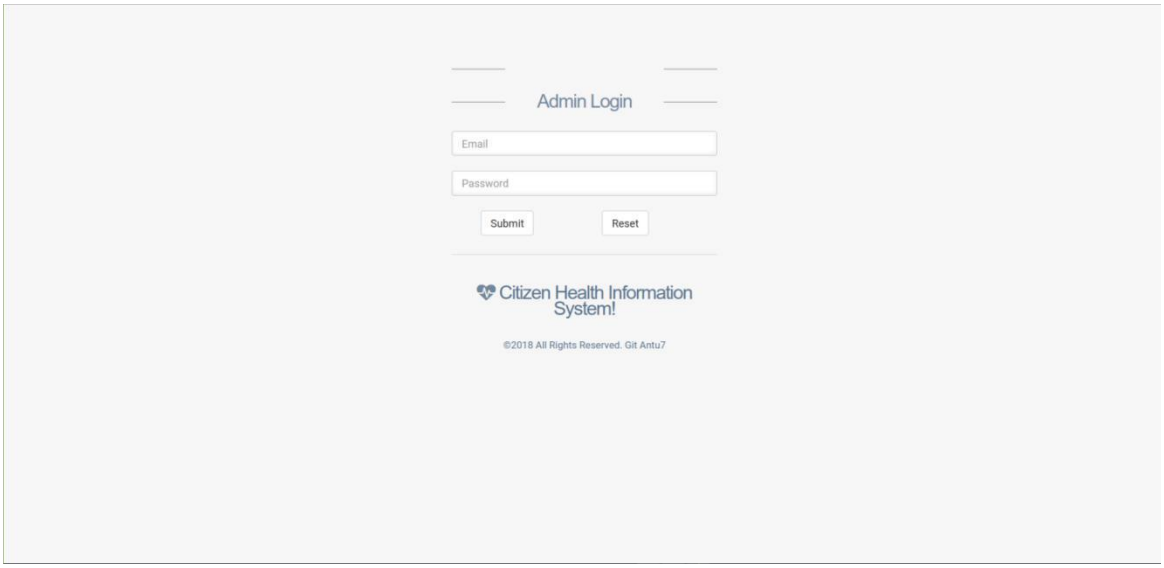

Figure 6.1.17: Moderator Login

6.1.18 Moderator Report Dashboard

After successful login moderator will able to view this diseases report dashboard

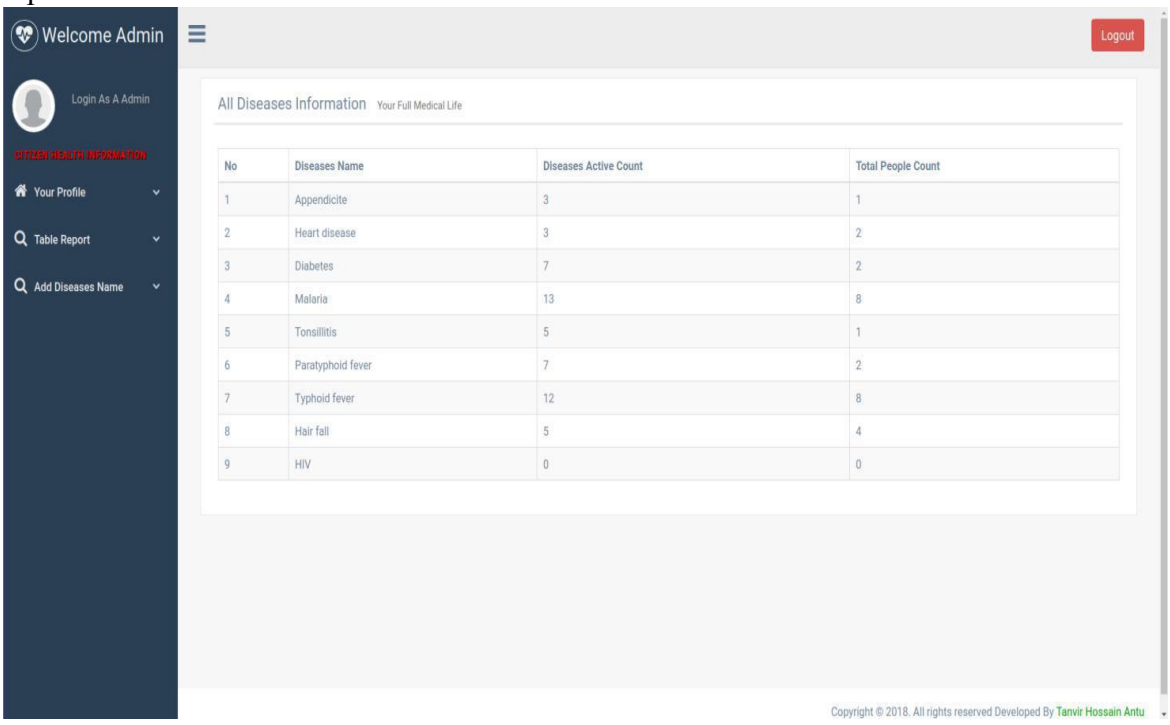

Figure 6.1.18: Moderator Login

6.1.19 Moderator Add Diseases Name

In this page moderator will able to add diseases Name

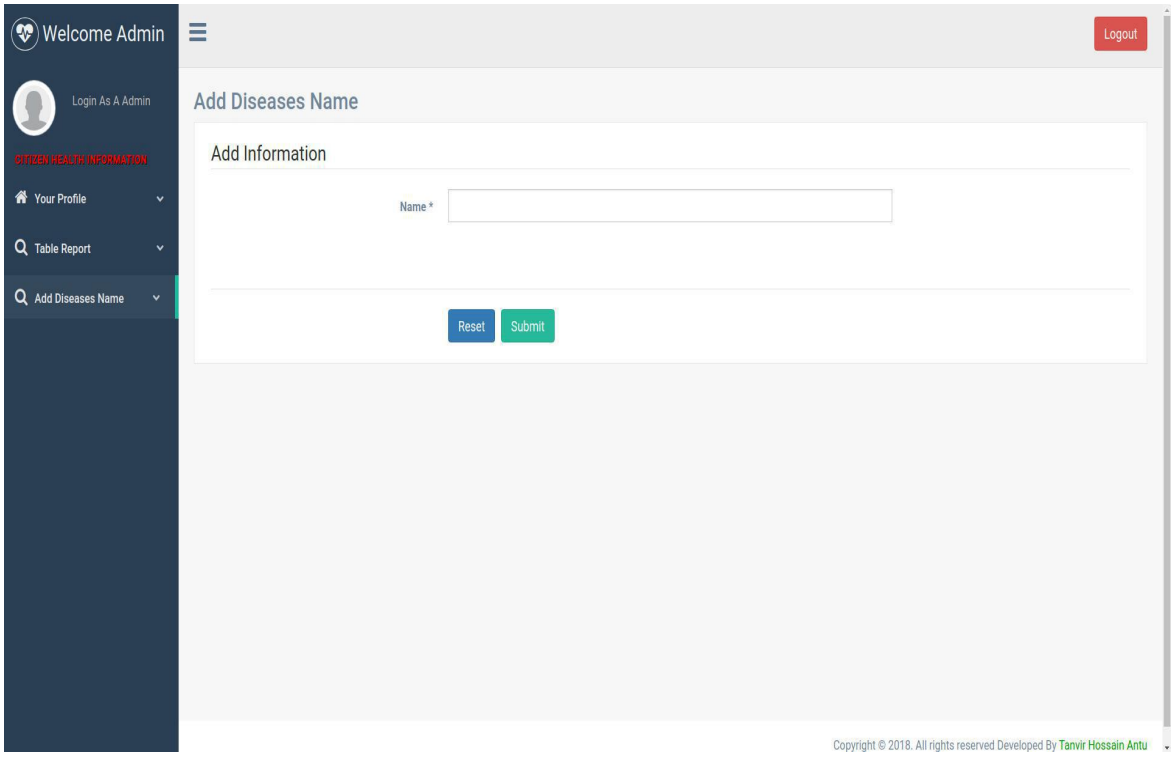

Figure 6.1.19: Moderator Add Diseases

Chapter 7: Project Summary

7.1 Github Link

- https://github.com/Antu7/medical

7.2 Limitations

Though this application will help patient and doctor quite well. There is still need a lot of medical data. So the more patient and doctor will use this app the more accurate the app will be helpful.

7.3 Strength of the System

The main goal is to make a central database and that can keep full medical life information. Where patient or Doctor can easily find his Diseases information, Medicine information, Doctor Information, Test report information anytime anywhere. Also the Moderator can monitor a record about which diseases active more in our country and how many people affected right now. Most of the major objectives of this system already built up by following requirement collection, system analysis and design and by testing it. After that this system becomes ready for production. System is built on top technology so it is stable, reliable and future maintainable. This system will help our medical system, medical institution, doctor, and patient.

7.4 Future Scope

The system has been developed for research purpose to see how much impact it has. A product has been built without compromising its main goal. If I get support from larger team and government supports this project then lots of advanced and rich feature can be implemented. If the all goals of this project can be implemented with more new goals it will become one of the most popular and grateful project in our country.