# WEB APPLICATION FOR PREDICTING DIABETES IN YOUNG PEOPLE OF BANGLADESH BY MACHINE LEARNING-BASED APPROACH

**BY**

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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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**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

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# APPROVAL

This Project titled "**Web Application for Predicting Diabetes in Young People of Bangladesh by Machine Learning-Based Approach**", submitted by **Kismet Roy ID: 172-15-9746** 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 September 9, 2021.
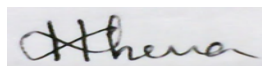
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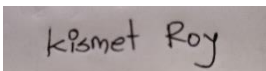United International University

# DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Md. Azharul Islam Tazib, 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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Finally, I must acknowledge with due respect the constant support and patients of our parents.

# ABSTRACT

Diabetes is one of the deadly diseases that happens when the insulin hormone is absence and the sugar level in the blood increases abnormally. It is so deadly that is going on a peer-to-peer level on cancer. Once you have diabetes you cannot never got out its grasp. It is almost everyone's concern to prevent diabetes. But it has some genetical issue too.so I made a web application where anyone can check up their diabetes possibility. I have collected data from Bangladesh. First these data were processed and analyzed then I used different Machine learning algorithm to predict diabetes. Then implemented the model into web version. In the web application there will be doctor and hospitals for consulting the patients. And also, there will be an appointment system to make appointment to hospital with desired doctor.so I made a web application to predict diabetes and appointment system.

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# CHAPTER 1
# INTRODUCTION

## 1.1 Introduction

As a human, disease and illness is inevitable. From these diseases and illness there are some deadly diseases that cannot be cured. It slowly poisons the body then the person dies like HIV, Cancer. Like this Diabetes is also these diseases. It cannot be cured. So, our topmost concern is to prevent it. There is huge number of people who doesn't know if they have diabetes have or not but they do. So, I want made and web application where any people could predict their diabetes by giving some symptoms data. It is a user-friendly application so everyone can use it.

## 1.2 Motivation

The main motivation is that the people who have diabetes but don't know about it. In diabetes there is stages. If diabetes is diagnosed in an early stage, then the patient can take measure to prepare from the beginning and can control diabetes. But in rural area there is not do many doctors or hospital which can provide awareness about is and talk about it. Also, there is not so much about diabetes in those area. Now we all know that all medicine that needed for diabetes high costly.

So, if we all want to avoid that we have to detect it in an early stage. So, detecting diabetes is a logical thing to do and early detection is the keystone. So as a computer engineer, I was motivated to do the predicting from machine learning to web development.

## 1.3 Objective

The objective of this Project is as Follow:

    i.    Build a system that can predict diabetes possibility at an early age under the age of 35 using web application.

   ii.    Explore the existing knowledge of web application and machine learning and diabetes.

  iii.    To ensure proper possibility from given input.

  iv.    To ensure proper guidance

   v.    To find Doctor and hospitals nearby

  vi.    Gets appointments from hospital/doctor

 vii.    Using admin to determine doctor and hospital profiling

viii.    People awareness about diabetes

So, we will carry out our objective one by one and our main objective is to predict the possibility of the young age diabetes.

## 1.4 Expected Outcome

The outcome should be like this:

By using this website, the people of urban and rural both can predict the possibility of having diabetes.

Also, after having a possible diabetes patient the site will provide him necessity option to see and Hospital and Doctor and then they will talk him through.

## 1.5 Project Management and Finance

so, my project is an online web project. Though I wanted to host this in an online server but I can't buy the domain the need international currency. So, the prediction was host on a free server called HERUKO and the all work done in the XAMPP local server so there

is no cost purpose. And all the management was done by me.

## 1.6 Report Layout

I have organized my report as follows:

In **chapter 1** I discuss about motivation objective and expected outcomes of the web application. Here the brief of the project is discussed. Management and finance are also discussed in this chapter.

In **chapter 2** there will be discussion about the background study about machine learning and diabetes. Then there will be an analysis what are I am going to do. And what challenges I am facing and will be death with.

In **chapter 3** I will have a discussion about requirement. Here in the chapter uses of use case and logical data model will be discussed.

In **chapter 4** the main discussion in this chapter will be design specification which include Front and back-end design. All the design database and work in order will be shown here. Also, implementation requirements will be shown here.

In **chapter 5** the implementation of the proposed system, testing system will be discussed in the chapter. Like which method have been used? Which flow-chart was maintained? Also, the relations all will be illustrated in this chapter.

In **chapter 6** I discuss about the impact on society. What could diabetes do to society Environment. Also, the Ethical aspect of my project. Is it ethically good and why it is good also will be discussed? Then my plan for the project is also be discussed in this chapter.

In **Chapter 7** I discussed about the full project conclusion and also the results. And the future of the project like what can be done? Which sector are going to improve more recently and also the availability of the project

# CHAPTER 2
# BACKGROUND STUDY

## 2.1 Introduction
## 2.1.1 Diabetes

Diabetes mellitus, commonly known as Diabetes, is a metabolic disorder characterized by excessive blood glucose levels. Insulin is a hormone that transports sugar from the bloodstream to the cells, where it is used to produce energy. Diabetes causes either pancreas or the body cell's to be unable to generate enough insulin or to utilize it efficiently. Diabetes have basically 3 types:

a) Type 1 Diabetes: When the pancreas stops generating enough insulin, this kind of diabetes develops. The depletion of beta cells is the cause of this.
b) Type 2 Diabetes: In this situation, despite the fact that insulin is generated, the body's cells do not respond to it.
c) Gestational Diabetes: This kind of diabetes affects pregnant women and is caused by elevated blood sugar levels during pregnancy.

## 2.1.2 Web Application on predicting diabetes:

Now a days everyone uses internet and browsing website is like milli second time. Anyone can access anything from anywhere in the world. What we all lack is a proper guidance. In internet there is good and bad things all along. So I was doing the predicting the diabetes and implemented in a website. Which has been talking but not worked. And don't have any promising work.

## 2.2 Related Work

Many other Publishers have published their work on journal and research paper. All they did is to apply algorithm and do web application. So, in my application I did got an upgrade that on that I can get an appointment or to consult a doctor.

## 2.3 Comparative Studies

I planned to conduct my research on Bangladeshis. I've divided the research papers I've read into two categories: those that used the PIMA Indians Diabetes dataset from the UCI Machine Learning Repository, and those that used Bangladeshi individuals.

Then I learned about web programming and implemented that to website on a server on pc for databases.

## 2.4 Scope of the problem

After analyzing all of the aforementioned research papers, it is apparent that diabetes prediction and detection using Machine Learning techniques is one of the most popular study areas.
We can also realize that the task isn't finished yet, especially in the context of Bangladesh.

First of all, this is for medical science and to help people of needs so its scope is so huge. And furthermore, the predicting accuracy can be updated day by day. Now for website there will be user admin hospital and doctor so it can be updated daily. And a medical help can be more and more improved day by day. Also, it can be governmental project too. So its scope is huge as my perspective.

## 2.5 Challenges

The most difficult task I had was gathering information on diabetic individuals. I needed authorization from the Director of the Hospital to gather data from Bangabandhu Sheikh Mujib Medical University in Dhaka (BSMMU). I had to apply through my university department, which took a significant amount of time and effort.

I could only manage a little quantity of data after spending a week in the hospital. Due of the COVID-19 epidemic, I was unable to collect data on the spur of the moment and had to conduct the survey while incurring several health risks.

Later in website I have to do the linking in between hospital doctor and admin. It was most difficult compared to the other links like user to doctor, doctor to hospital. Appointment to user and hospital.

# CHAPTER 3
# REQUIREMENT SPECIFICATION

## 3.1 Business Process Modeling

I am doing this project to help people in need and urban and rural people can have check their possibility of having diabetes. The main is to set up a server to do the main work of prediction and the PHP to be work of the connection between database and application. Here all is to set the server. any sever can work any local or online. That's the web project will be alive 24x7.

## 3.2 Requirement collection and Analysis

I obtained the information from Dhaka's Bangabandhu Sheikh Mujib Medical University (BSMMU). My dataset has a total of 1036 entries. There are 16 qualities or features, 15 of which are independent and one of which is dependent and is called "Class." To put it another way, the "Class" characteristic is the variable that determines whether or not a person has Diabetes by web application.

The attributes and their value type are given in the following table.

Table 3.2: Dataset attribute and class and value

| Attribute | Value Type |
|---|---|
| Age | Numeric/Discrete |
| Polyuria | Male(1)/Female(0) |
| Polyphagia | Yes(1)/No(0) |
| Polydipsia | Yes(1)/No(0) |
| Weakness | Yes(1)/No(0) |
| Sudden weight loss | Yes(1)/No(0) |
| Itching | Yes(1)/No(0) |
| Visual Blurring | Yes(1)/No(0) |
| Irritability | Yes(1)/No(0) |
| Delayed Healing | Yes(1)/No(0) |
| Obesity | Yes(1)/No(0) |
| Alopecia | Yes(1)/No(0) |
| Class | Yes(1)/No(0) |

so this type and attribute I created the database and collected around 1036 data.

## 3.3 Use Case Modeling

### 3.3.1 User Use case

Here we can see by Figure 2 that User uses login. Then from login he can predict. Search for hospital. Also can have doctor. Or to got an appointment user have to go into login first. My first base case is to use user information then predict the possibility of having diabetes mellitus.
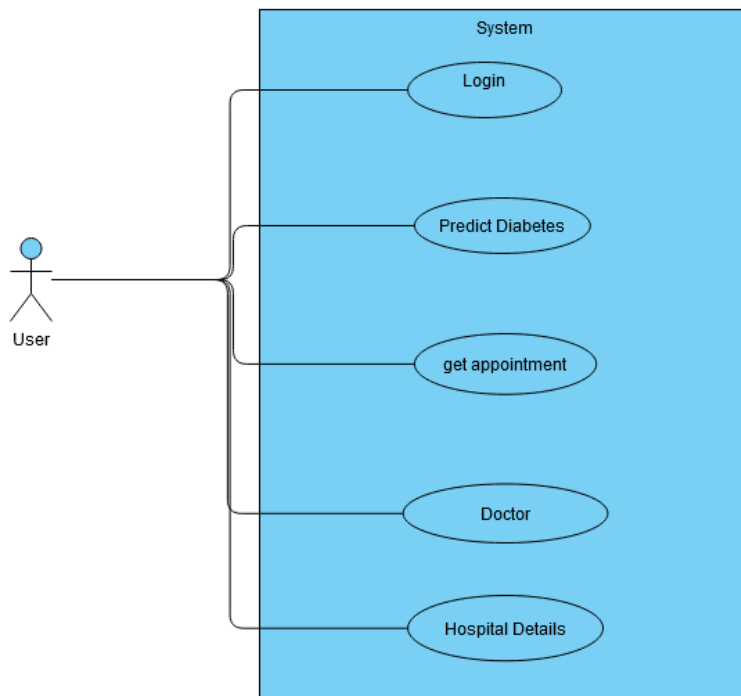


Figure 3.3.1:  User Use Case Modeling

### 3.3.2 Doctor Use Case

In this website a very crucial play is for doctor. We all know how busy a doctor can be. So as we doing other they have a little time to spare. in that time, we got an appoint system. So that doctor doesn't have tensed about timing anymore. First have to registered as an doctor with proper information.
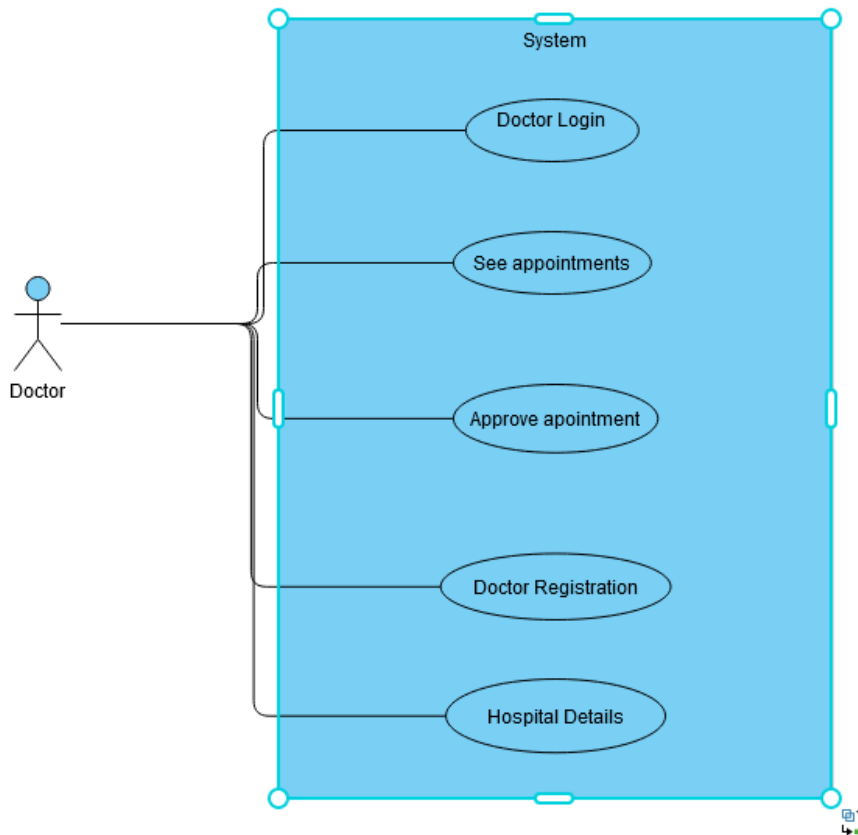


Figure 3.3.2: Doctor Use case Modeling

### 3.3.3 Admin Use Case Modeling

Admin panel is where all the approve list is going to happen. An admin has an control over all the option available. List of action of a doctor is given below:

i.      Admin login

ii.     Notification about any new entry

iii.    User Details

iv.     Doctor Detail

v.      Update/ Delete Doctor

vi.     Appointment Detail

vii.    Display all User and Doctor

So many option has given for as an like super admin. In Figure 3.3.3 use case diagram I shown all the option available for an admin
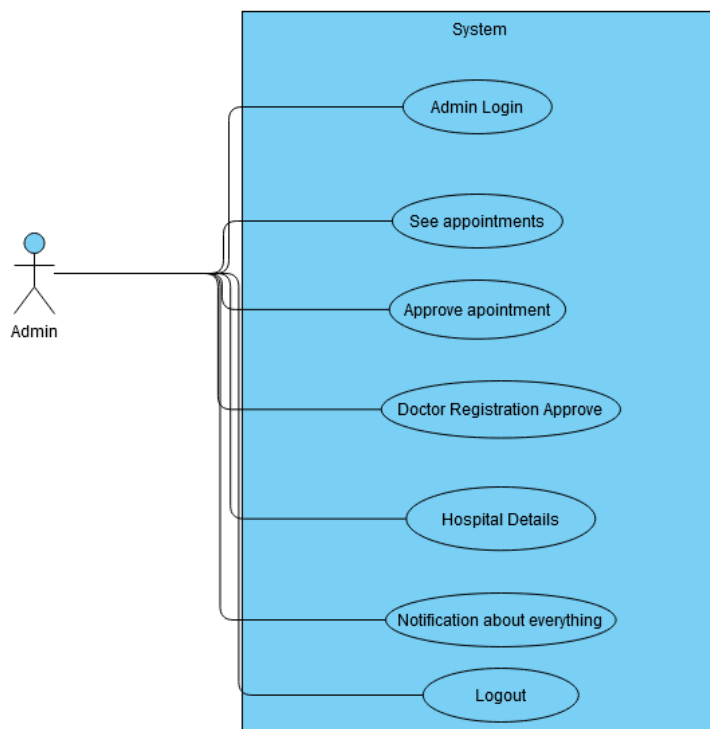


Figure 3.3.3: Admin Use Case Modeling

So as In figure 3.3.1 , 3.3.2, 3.3.3 we all see the differences between  User panel Doctor panel and Admin panel. So from uses of use case diagram is to understand which actor have which work.

Doctor and Admin have the same authority but admin has more authority and more work also.

## 3.4 E-R Diagram

Another representation of relation between actor and machine or system is E-R diagram . in below figure 3.4  is an E-R diagram. Here all the relation is shown all attribute are shown and also the attributes. So as in E-R diagram I draw and point out how the user act how many option a user can have. Algo goes for Doctor and admin. All their work is in rectangle shape and the relation between them in in diamond shaped. And lastly the circle is the Attributes which will be fil up by their respective position.
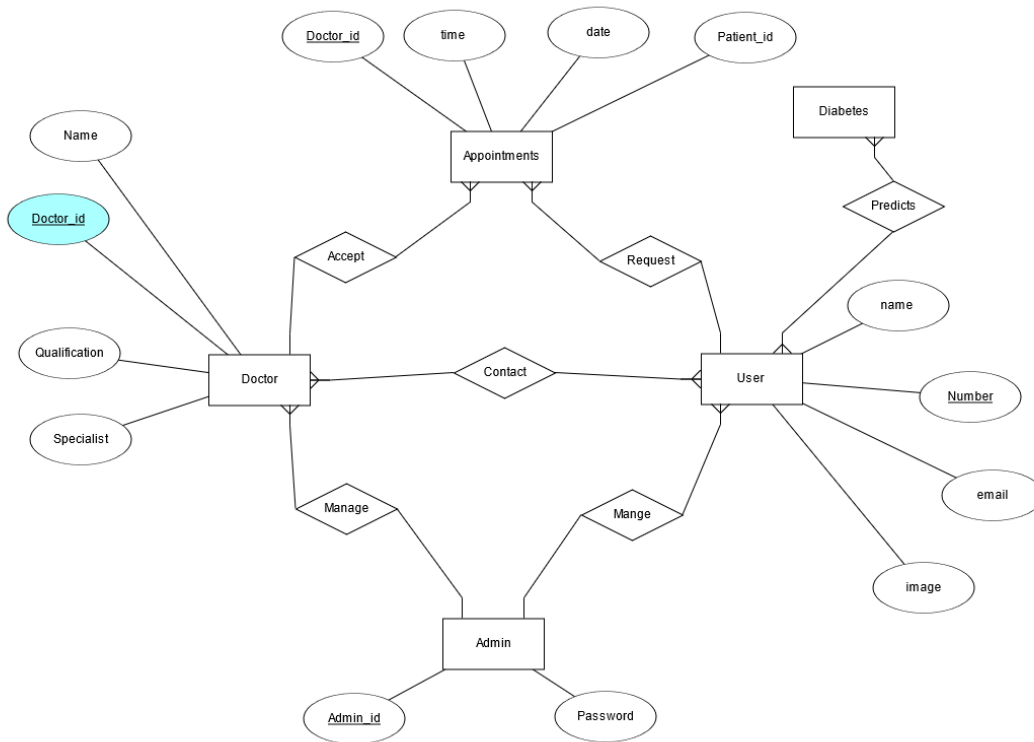
Figure 3.4: E-R Diagram

## 3.5 Design Requirement

The dashboard is the ultimate designed customed front page.an d the actual view comes from framework. HTML,CSS JavaScript additionally used to demonstrate the option of Admin, Doctor and User. Each of these has their own dashboard and different different option. With all of that done with bootstrap with HTML,CSS,JavaScript.

# CHAPTER 4
## DESIGN SPECIFICATION

In this chapter, we will talk about the all procedure all material in a detailed way. All the details information of design front-end back-end and all other will be discussed here.

## 4.1 Front-end Design

My project Front-end design has been implemented by HTML( Hypertext Mark-Up Language) is the base for using documented design to be showed in Website's. Bootstrap (5) incorporates HTML and CSS-based layouts for frames, buttons, interface elements, and routes, as well as optional JavaScript enhancements.

Like an data passing or for and pop up box I have used JavaScript. Mainly All Front-end is done by Bootstrap. The reasons of using Bootstrap is given below:

  a) Compatible with any browser even cross platform
  b) Lightweight because all data has and CDN server.
  c) Doesn't change that much in version update
  d) The grid system is pretty comfortable to use
  e) Responsive structure and style

So as my perspective I see the potential to uses of Bootstrap really helps and save oud time.

## 4.1.1 Homepage

First impression is the best impression. So I try to make the website more eye catching as I can. In the Figure 4.1.1.1 has been shown that how the homepage look and all the option is right available in the front. It beacame more and more handy to be present your whole website just in a single. As you can see u can direct go to the predict and login option also in 4.1.1.2 u can see the details about the project.
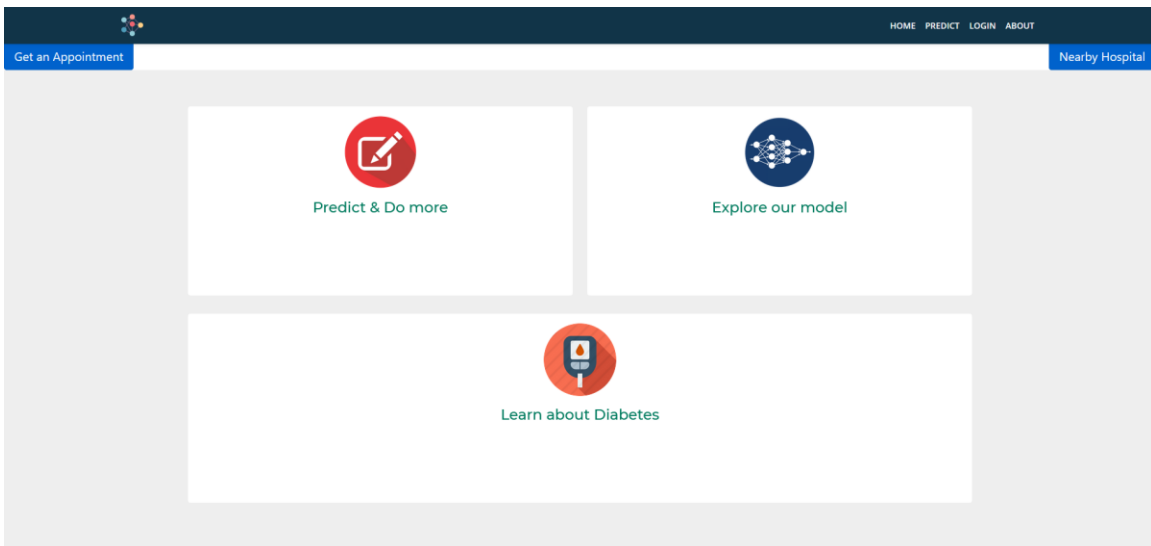
Figure 4.1.1.1: Homepage



Figure 4.1.1.2: Homepage

## 4.1.2 Login page

It was complusory because now a days every one use data to steal data. So login system was essential. The website uses user login information to saved their data. So every time they log in they have to put their email and id . I have made 3 Different Login interface Shown in Figure 4.1.2 . For three different actor: Doctor, user and Admin which is represented by consequently by Figure 4.1.2.1, 4.1.2.2 and 4.1.2.3.
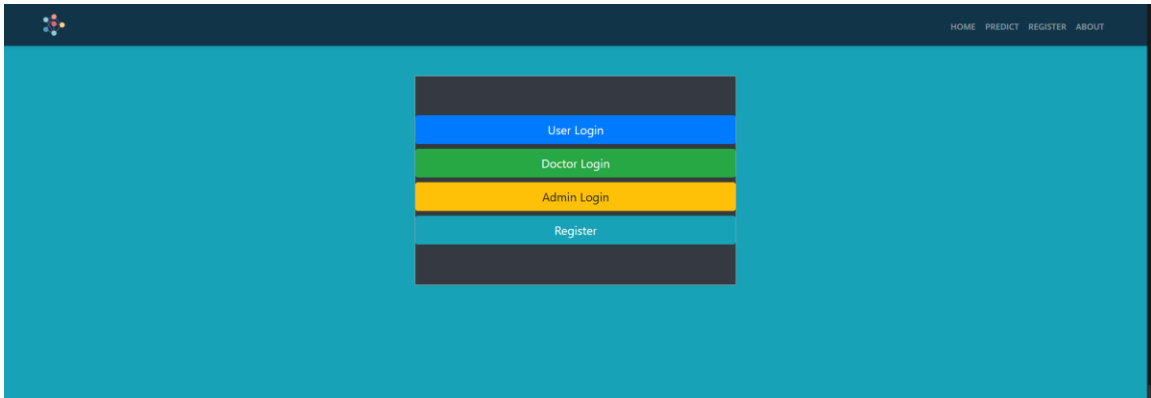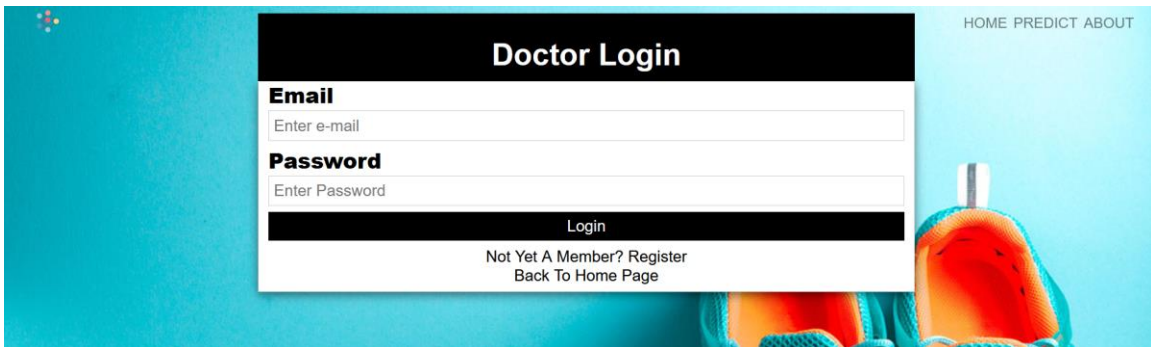
Figure 4.1.2:  Login page
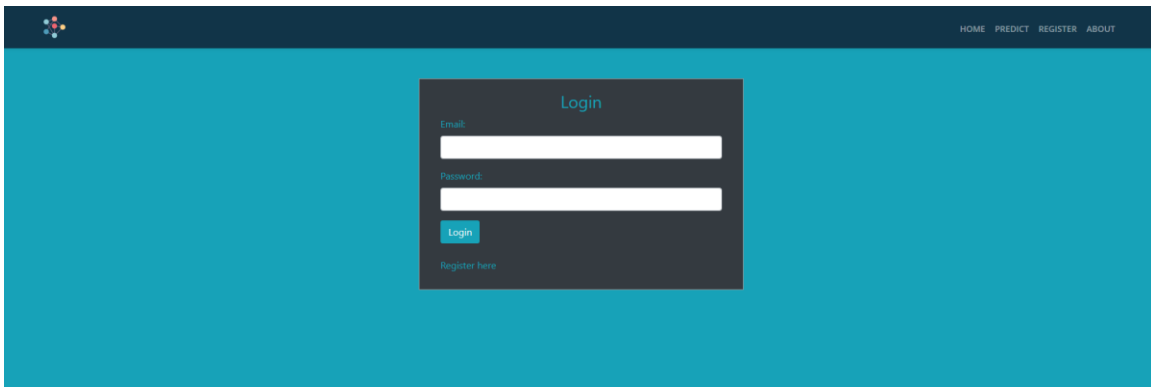


Figure 4.1.2.1:  Doctor login
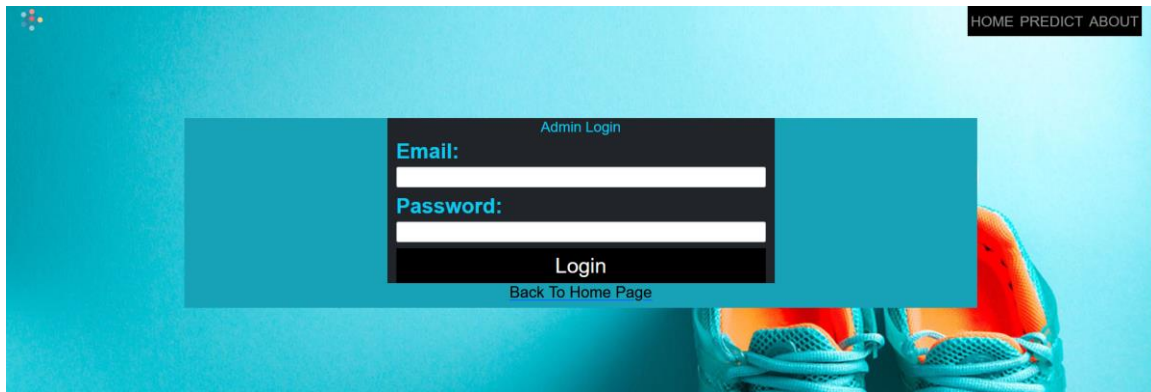


Figure 4.1.2.2:  User Login

Figure 4.1.2.3: Admin Login

## 4.2 Backend

The project I have made the back-end technology used in it is PHP. I suppose we all know that PHP is a server scripting language. To store our data and bring our data we need an server. So we used PHP language. First I designed the database models and then with help of MySQL query I store and retrieve the data. If I use static data then it can be leaked anytime. There are table for 3 Actors. User, Doctor and Admins As Well. So I use PHP for to connect the web application to my database.

PHP functionality :

   I.    Data exchange By User and Doctor

  II.    Every single data of Appointment,User,Doctor are stored

 III.    Between pages it can transfer data

 IV.    MySQL query can be easily executed.

  V.    Sessions makes the site more user-friendly.

### 4.2.1 Admin Back-end

So in my project admin is like a super admin. Like an eagle eye. every thing he can see he can change or delete it. He can also observe and change decision. One of many option in Figure 4.2.1 I have shown the available option and its all the program, he can do.

Admin has the super authority to User and Doctor. Even the doctor have to take approval from admin to do his work like getting appointment or so on. Admin can see and approve doctor list. Also send notification to those who haven't update their profile. Also see the full list of doctor. Select Doctor and also full details of Doctor.
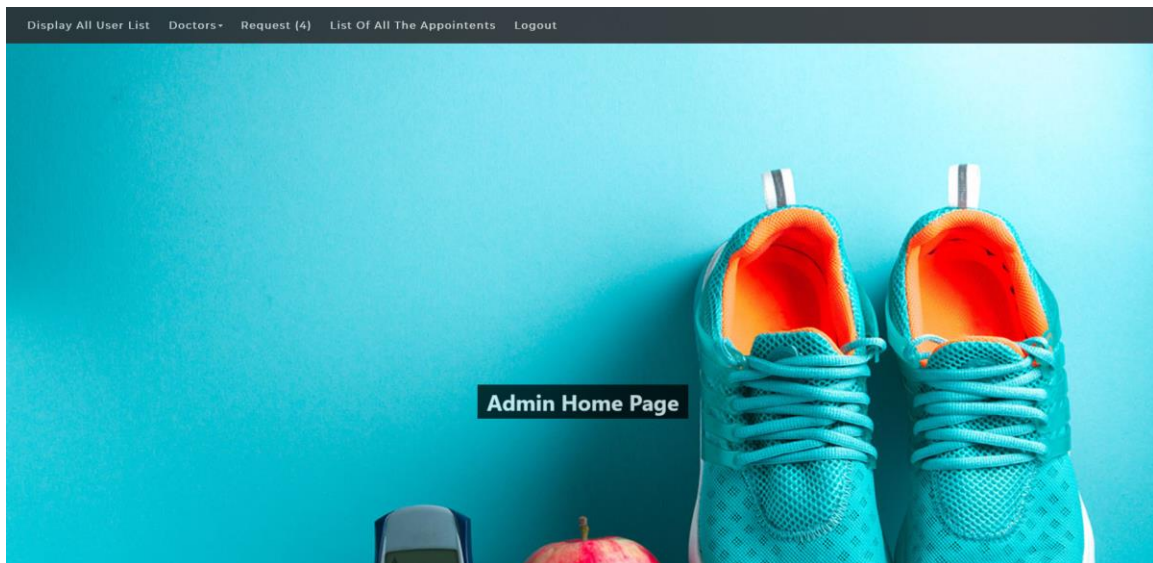


Figure 4.2.1:  Admin Home Page

**4.2.2 Doctor Back-end**

In doctor option there is have 5 option to be pprecise. All are interconnected with user list. Like appointments are connected with user. Profile updating. Also have a notification option available.
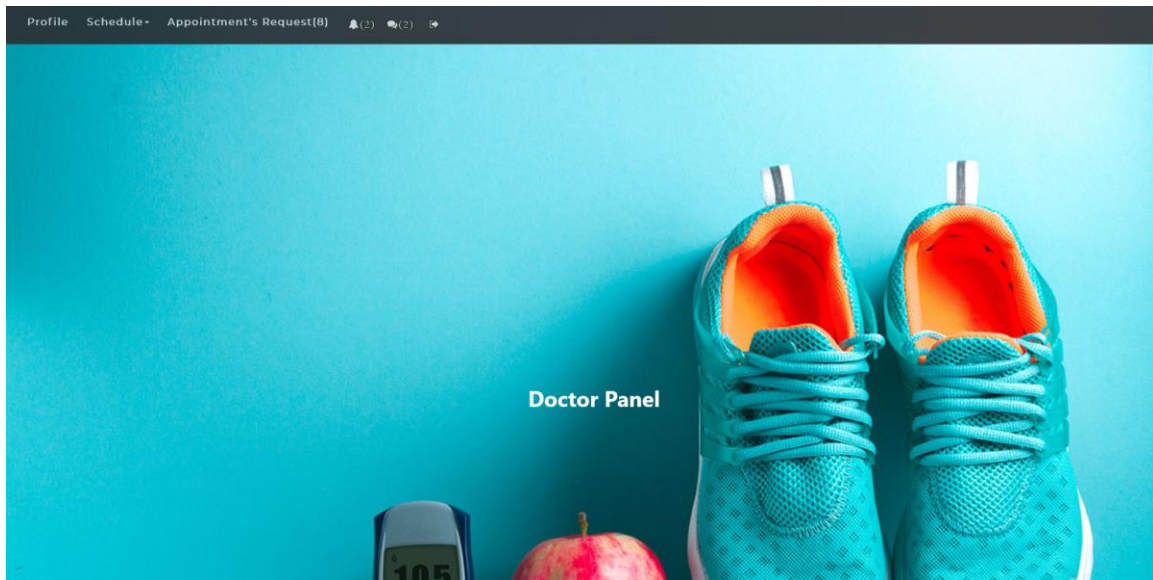
Figure 4.2.2: Doctor Panel

## 4.3 Interaction Design and UX

Interaction design is critical for every venture since it is an extraordinary administrator between a framework and a customer. This is a combined strategy that will make it easier for a client to engage with the framework. It encourages a customer to save their money. There are a few metrics for portraying a framework or programming to clients that will improve the customer experience.

## 4.4 Implementation of Requirements

Fort this web project I have used both component like:

    a. Hardware

    b. Software

## Hardware

Hardware components are given below:

    ✓ Pc

    ✓ Local Server Enabled system

## Software

Software components are given below

- Xampp For server Purpose
- Any Browser (Chrome and Firefox I have used)
- Any coding composer Software like VISUAL STUDIO,SUBLIME TEXT ( I use Visual Studio Code)

So my work became combine of these. I have to open a server in local server by XAMPP. Then using PHP code in Visual studio code I performed the project and tested each and every step in Browser for looks and design.

# CHAPTER 5
# IMPLEMENTATION AND TESTING

## 5.1 Implementation of Database

Database is for maintaining an website. Database is crucial for saving and storing data. If there is a patient and doctor actor their data will be huge. So we can't make website static. We have to be dynamic. That's why this database. Also updating and deleting purpose we need Database. In world there is a vast variety of database. But I have used MySQL database. MySQL is commonly used in transaction, e-commerce and because it can be local so yeah it can help a much than other database system.

My Database description is given below:
- Database name : Diabetes.sql
- Table : 12 table with multple columns and rows

In figure 5.1 show the database name along with the 12 tables. In my diabetes.sql database I created 12 table for data entry and combination. In every table there is column and row. Each column represent attributes of that table and row indicates the quantity of data.

| | Table ▲ | Action | | | | | | | Rows | Type | Collation | Size | Overhead |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | admin | ★ | Browse | Structure | Search | Insert | Empty | Drop | 1 | InnoDB | utf8_general_ci | 16.0 KiB | – |
| ☐ | appointment | ★ | Browse | Structure | Search | Insert | Empty | Drop | 3 | InnoDB | utf8_general_ci | 48.0 KiB | – |
| ☐ | comment | ★ | Browse | Structure | Search | Insert | Empty | Drop | 11 | InnoDB | utf8_general_ci | 16.0 KiB | – |
| ☐ | consulting_schedule | ★ | Browse | Structure | Search | Insert | Empty | Drop | 3 | InnoDB | utf8_general_ci | 32.0 KiB | – |
| ☐ | doctor | ★ | Browse | Structure | Search | Insert | Empty | Drop | 26 | InnoDB | utf8_general_ci | 16.0 KiB | – |
| ☐ | doctors | ★ | Browse | Structure | Search | Insert | Empty | Drop | 6 | InnoDB | latin1_swedish_ci | 16.0 KiB | – |
| ☐ | doc_message | ★ | Browse | Structure | Search | Insert | Empty | Drop | 0 | InnoDB | utf8_general_ci | 48.0 KiB | – |
| ☐ | message | ★ | Browse | Structure | Search | Insert | Empty | Drop | 0 | InnoDB | utf8_general_ci | 48.0 KiB | – |
| ☐ | schedule | ★ | Browse | Structure | Search | Insert | Empty | Drop | 16 | InnoDB | utf8_general_ci | 32.0 KiB | – |
| ☐ | tbl_comment | ★ | Browse | Structure | Search | Insert | Empty | Drop | 3 | InnoDB | utf8_general_ci | 16.0 KiB | – |
| ☐ | user | ★ | Browse | Structure | Search | Insert | Empty | Drop | 2 | InnoDB | utf8_general_ci | 16.0 KiB | – |
| ☐ | users | ★ | Browse | Structure | Search | Insert | Empty | Drop | 1 | InnoDB | latin1_swedish_ci | 16.0 KiB | – |
| | **12 tables** | **Sum** | | | | | | | **72** | **InnoDB** | **utf8mb4_general_ci** | **320.0 KiB** | **0 B** |

Figure 5.1:  Database

## 5.2 Implementation of Front-end Design and Back-end Design

Now as our database got created now we will walk through front and back end design. For that we will use HTML,CSS,JAVASCRIPT, PHP. Here all the activity and all the process are shown by the following figures.

### 5.2.1 User Prespective

Here User their Login pass to enter. User has multiple activity around him. He/She can preidict diabete. Also he can search nearby hospital and other options too.
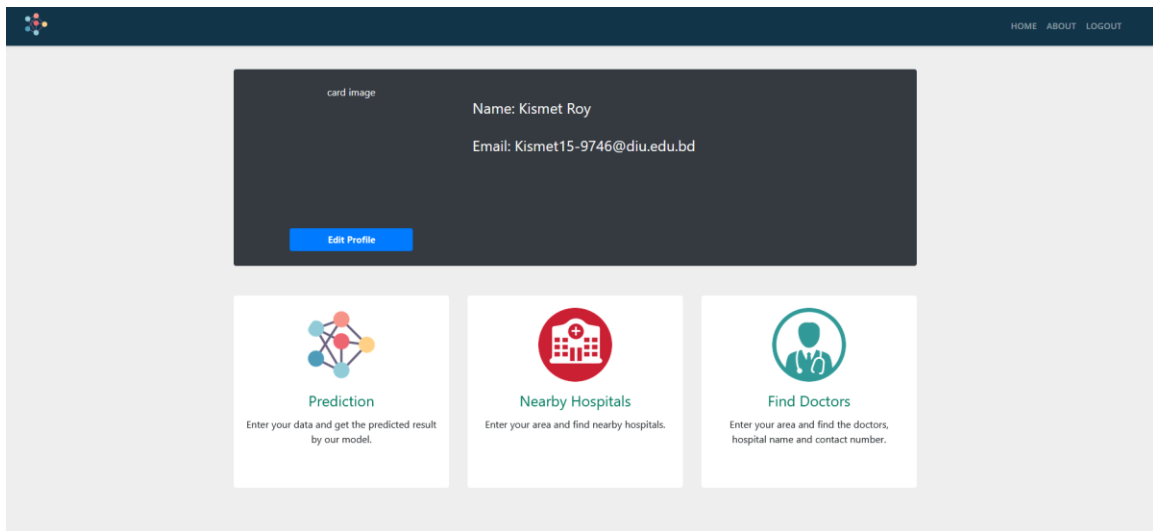


Figure 5.2.1.1: User Home page

Here user will show all the possible showcase of user option. Like Prediction, Hospitals, Doctors and so more. Also for editing profile u can edit name email and password. All the other option are available. Can directly access to all other option. So all the optin for user are here shown and detailed figure are given below.
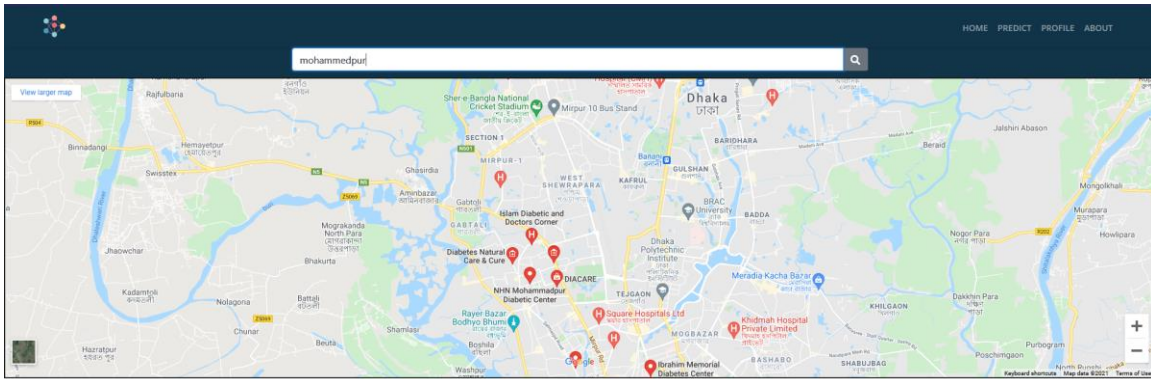
Figure 5.2.1.2: User Nearby Hospital Option



Figure 5.2.1.3: User  Possibility Of Predict Diabetes

Figure 5.2.1.4: Doctor By Area

## 5.2.2 Doctor Perspective

In Doctor Option  and objective are Shown in following Figures.All doctor have the same option.option are written below:

- Homepage for Doctor
- Profile Updating
- Schedule of doctors
- Appointment's Request
- Message
- Notification

And each opotion have their own type of work. Like in profile you can edit your profile. In schedule you can change your time table. And so on. In below all the option will be presented by figure.
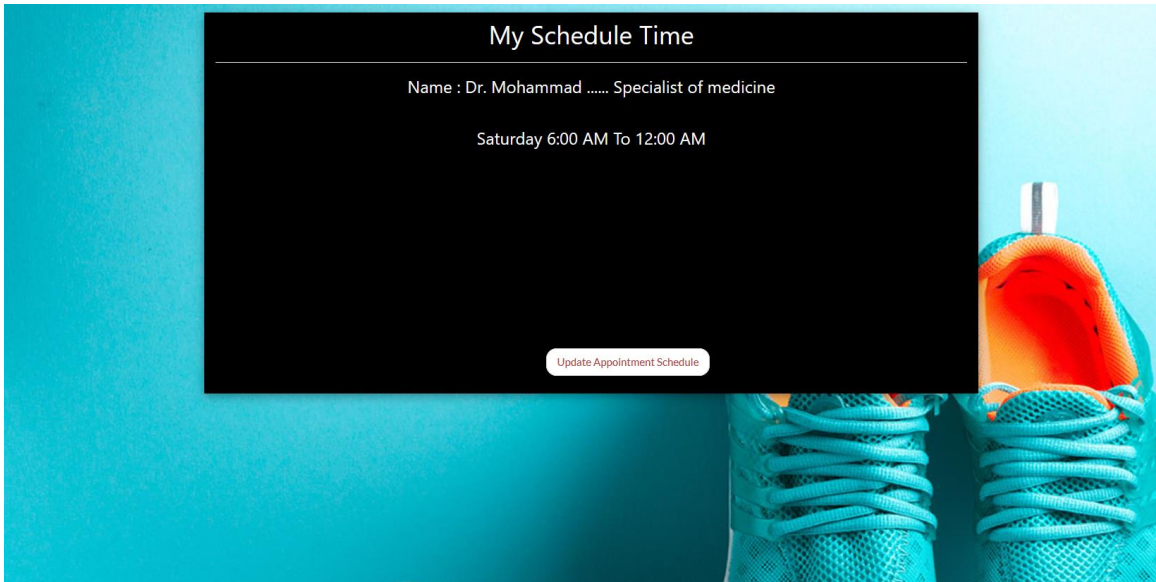
Figure 5.2.2.1:  Doctor Schedule



Figure 5.2.2.2:  Personal Profile

Figure 5.2.2.3: Doctor patients Request

In above figure there is the list of appointment a doctor got. Here is also the option for Approve or delete appointment. Also search appoint by id. So these are the option available for doctor .

## 5.2.3 Admin Perspective

In my project admin is given a very crucial role.as all the option are being there for admin. This admin can be govt. so that they can track each and every entry. Every notification is given, every doctor registration is need to be approve by admin. So if the govt. take this project they will have the overall control over the website.below I listed the activities of admin:

- Update/delete or View user list
- Update/Delete or View doctor list
- Update/Delete or View Doctor Approval Request
- View all the Appointment list

So all these are connected to PHP and with front end and backend.below all the figure will be shown for all the activities done by Admin.
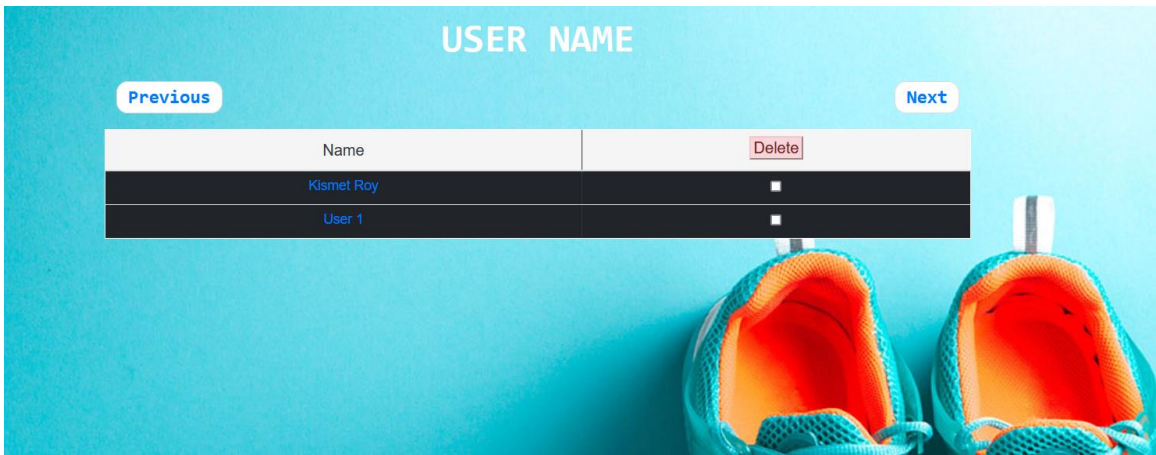
Figure 5.2.3.1 Admin User full list

As shown here admin can delete any user.also the full list of user .



Figure 5.2.3.2: Admin All Doctor List

Here all the specified Doctor list is shown after selecting any doctor the all lsit of apointed is will get shown. Here is a variety of  doctor list.

Figure 5.2.3.3: Admin Doctor Registration

It is an interesting section. Although doctor can registration differently and have to wait for approval. But if the registration is done by a admin then the doctor doesn't need fro approval it automatically added to list. A detailed registration is needed for future approach. Here have all the attribute like name, email, Specialist, designation are written.

Figure 5.2.3.4: Admin Doctor Approval List

In above Figure there is the approval list. Here all newly registard doctor approval list. After bring corrected and seeing genuine Doctor or not then Admin Approve. Then the doctor can use the other functionality.
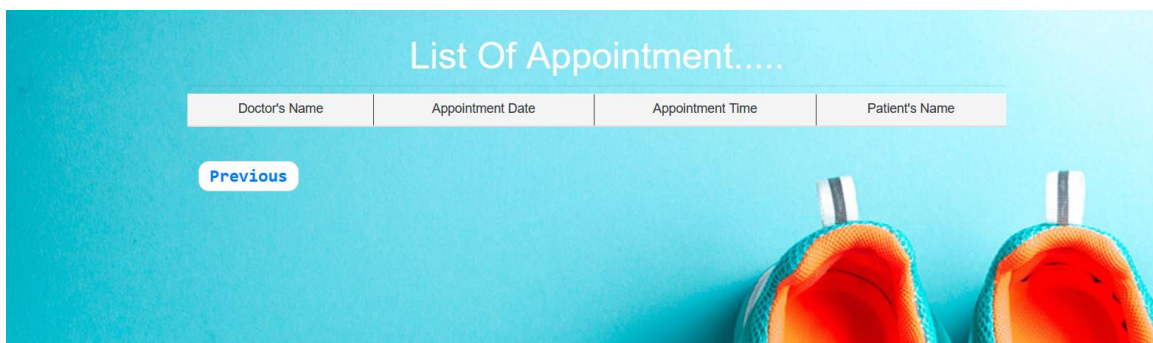


Figure 5.2.3.5: Admin all appointment List

So these are the activities that does the job for admin. It was req for maintaining the balance of supremely.

## 5.3 Testing Implementation

Test my web app "predicting diabetes possibility by machine learning".all that have that are written below

- o **Registration page test**

In this page all field are required and also I have used the bootstrap form validation so without proper value the submit button will not work.

- o **Doctor Registration**

  In this page also I have given the bootstrap form validation. Doctors have to wait for admins approval. Doctor personal information is not disclosed in user option.

## 5.4 Test Result and Report

Test are for cathing error. Each and every step are tested so that the error cannot happen. All result come from are very much ok to me. But as I don't know about proper way to testing more in details I took the help of our supervisor. He showed me the way of doing testing and result and report. All thanks to him I had found some bugs and able to recover it in time.

Now result are showing much more improvement then before. Testing experimentend resulted in normal outcome.also there was an test of compatibility. For mobile and tab it show the same type website.

# CHAPTER 6
# IMPACT ON SOCIETY,ENVIRONMENT AND SUSTAINABILITY

## 6.1 Impact On Society

First of all diabetes is a chronic disease. The main impose is that it's the economic burden is too high on society. And one of the costliest diseases is diabetes. In 2020 almost $194 billion money was used for diabetes cure only in the usa.so a huge number for all over the world. So it's a heavy burden for society. So I want is to predict diabetes in an early stage so that the cost of full diabetes reduces.

Also, the people having diabetes is having some other difficulty as well like any would be lethal. Any other diseases don't go out easily. so they died many times faster than normal people. So it also hurt society.

## 6.2 Impact on Environment

Both genetic and environmental variables have a role in the development of type 2 diabetes. Several gene alterations have been related to an increased risk of diabetes, according to researchers. Not everyone with a mutation develops diabetes. Many persons with diabetes, on the other hand, have one or more of these mutations.

According to a new Finnish study, two environmental factors for type 1 diabetes, particularly early influenza viruses' infection and early cow's milk intake, might enhance the immune reaction to bovine insulin in babies with higher Human leukocyte antigen disease propensity if present concurrently.

So the impact on environment for diabetes is too powerful that. It can also affect the ecosystems.

## 6.3 Ethical Aspects

The history of diabetology is littered with examples of biomedical discoveries being

applied to clinical practice far too slowly, delays in assessing scientifically therapeutic goals, treatment habits based on anecdote or prejudice rather than logic, and science pseudo-progress driven more by commercial interests than by the interests of those affected.

"The immediate objective of scientific experimentation must always be development in medical knowledge and practice," and ".he who tries to manipulate people by making

them tools for the achievement of his own goals not only violates them as individuals, but also destroys his own dignity as an individual."

So ethically speaking people should do more of public service rather than private for humankind. The project is to ensure people to be sure to be having diabetes and so on.

## 6.4 Sustainability Plan

For my project my plan is to first to give it a go in market for data purpose and many data could help me in how my predict work. Then I want this to be a government project. So that everyone can use it to be free. And contribute is also there so anyone can contribute to anything in any part in the project.

# CHAPTER 7
# CONCLUSION AND FUTURE SCOPE

## 7.1 Conclusion

"predict possibility of diabetes by machine learning" is a web application that enables people to use their symptoms for predicting the possibility of diabetes. Also the implementation of appointent system and doctor system.

I have researched about these type of system. Many doctors said many patient came very late stage when doctor have nothing to do so. They said if machine can help they can gradually accept. Also the user said if it can predict accurately then it will help much more to be go from 1 place to other. Also online appointment  system is very muchly the next thing in medical history

## 7.2 Future scope

 Online platform is an platform which is updating day by day. So it's getting huge day by day. My web application has so many scope in future. Any field can be accepted here. In here below I will discuss about some future scope of it:

- ➢ **Business Scope**
  Now its free but in future it can be a business prespective app. Like for getting an appointment you have to pay. Then again if the hospital buys it then there's money and if it can present in good way govt. can be involved in this.
- ➢ **Machine Learning scope**
  Here we use a some symptoms to predict diabetes. But after that new algorithm can be use new diseases like cancer can be predicted. So the possibility of Machine Learning is huge and I have a potential of its own.
- ➢ **Mobile application**

Now a days almost 80 to 90 percent people have mobile phone. And app instation ius very easy. So anyone can convert this to any mobile app. And mobile app market is so huge and it aslo an medical app so it shall be running smoothly.

- ➢ **Medicine help**

    Medicin help or selling or buying can be added to its core. Suppose a online doctor pescribed some medicine but u were not able to get that because of your condition so u can add that in your medicine centre there. It can be helpful and will be reality in future.

- ➢ **Hospital Appointment**

    Now in our website have is Doctor appointment. But in future it can be upgraded to hospital appointment. So anyone from anywhere can appoint their token from home and go to their desired hospital in time. That can be happen any day now.

# REFERENCES

[1] Learn about Diabetes, available at << https://www.who.int/health-topics/diabetes >>, last accessed 03/04/2020

[2] Made E-R diagram, available at << https://erdplus.com/>>, last accessed on 16/07/2021

[3] S. M. H. Mahmud, M. A. Hossin, M. R. Ahmed, S. R. H. Noori and M. N. I. Sarkar, "Machine Learning Based Unified Framework for Diabetes Prediction," in BDET 2018: Proceedings of the 2018 International Conference on Big Data Engineering and Technology, 2018.

[4] S. K. Dey, A. Hossain and M. M. Rahman, "Implementation of a Web Application to Predict," in 2018 21st International Conference of Computer and Information Technology (ICCIT), 2018.

[5] M. F. Faruque, Asaduzzaman and I. H. Sarker, "Performance Analysis of Machine Learning," in 2019 International Conference on Electrical, Computer and Communication Engineering (ECCE), 2019.

[6] K. C. Howladar, M. S. Satu, A. Barua and M. A. Moni, "Mining Significant Features of Diabetes Mellitus Applying Decision Trees: A Case Study In Bangladesh," Cold Spring Harbor Laboratory, 2018.

[7] N. S. Khan, M. H. Muaz, A. Kabir and M. N. Islam, "Diabetes Predicting mHealth Application Using Machine Learning," in 2017 IEEE International WIE Conference on Electrical and Computer Engineering (WIECON-ECE), Dehradun, India, 2017.

10  Nurjahan, Mohammad Abu Tareq Rony, Md. Shahriare Satu, Md Whaiduzzaman. "Mining Significant Features of Diabetes through Employing Various Classification Methods", 2021 International Conference on Information and Communication Technology for Sustainable Development (ICICT4SD), 2021
Publication

<1%

11  Fayroza Alaa Khaleel, Abbas M. Al-Bakry. "Diagnosis of diabetes using machine learning algorithms", Materials Today: Proceedings, 2021
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15  scholarworks.iupui.edu
Internet Source

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16  Aayushi Bansal, Anita Singhrova. "Performance Analysis of Supervised Machine Learning Algorithms for Diabetes and Breast Cancer Dataset", 2021 International

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