بسم الله الرحمن الرحيم

AN-NAJAH NATIONAL UNIVERSITY

Computer Engineering Department

Software Graduation Project

Clinic App and Website

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A report submitted in partial fulfillment of the requirements for
bachelor's degree in computer engineering in the Faculty of Engineering
Information Technology - Software Project
JAN,2023

Acknowledgements

We would like to express our deep gratitude for Dr. Sufyan's serious efforts and valuable time. We were able to complete this job thanks to his great advice and input. Thanks should also go to AN-Najah University which gave us the opportunity to study. we are grateful to our special professors in the Computer Engineering Department, Faculty of Engineering who generously offered their knowledge and tracked our progress as university students. we would also like to extend our gratitude to our families who are always by our side and supported us. they gave us the strength to complete this project. Many thanks to our friends also who supported us at all times. Finally, we would want to express our thanks to everyone who assisted and encouraged us to work on this project.

Bayan Tasneem.

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Abstract

As we live in the digital era it's important to have a direct way to interact between doctor and patient. Something makes booking appointments easier and quicker. A place to save medical info. Something to make communication easier. Our project is a mobile application and website that offers all these features and more for the outer clinics in the hospital. The application is for two types of users which are patients, and doctors. Patients can use this application to reach all outer clinics, display all doctors, and book appointments. They can find the best doctor with the highest rate in the clinic. Also, He can see the others' reviews about appointments with this doctor. This application gives him the flexibility to cancel the appointment and book again. After the appointment, the patient can see his prescription through his account, and he can add his reviews and rate this appointment. When the patient logs in, the application will ask him questions to list his medical history. On the doctor's side, he can easily reach his patients and see their information and their medical history. The doctor can make his schedule and select the available time for appointments. Also, in his profile, he can select his bill. In addition, he can display all the past and upcoming appointments with patients. For each past appointment, he can write the prescription. And for the upcoming, he can easily cancel them if he wants. If the doctor or the patient cancels the appointment after booking, an announcement will be sent to the other side and will be shown in his profile. The website is for two other types of users. The first one is the admin. The admin can view doctors, clinics, patients, labs, and appointments with all their data. He can also add a new clinic with its info. If a doctor signs up from the application, he will not be able to log in until the admin confirms his account. The admin also can see the summary of financials in the chart. The second user is the lab worker who can use the website to send medical tests to doctors.

1 Introduction

When you want to go to the outer clinics in the hospital you should pick up the phone and make a call until someone answers you and takes your info. What do you want, which clinic, which doctor, book an appointment, or do you want to talk directly? It takes a lot of time and sometimes you don't get what you really want. Also, from doctor's side doesn't know the patient who is calling and has no info about his medical history. He should collect this info. And, if he wants to change his schedule and cancel the appointment, he should call the patient and change the appointment to suit him and the patient. All these steps can easily be done by using a single mobile application. In our project, we build a mobile application and website to organize this process and make it easier and more fixable. When we were collecting the main features that are needed, we found that we needed to build an application and a website. Each one has different types of users. Patients and doctors for the application, and admin, lab worker for the website. We collected the data and searched for the design. Then we selected which frameworks and programming languages we will use to create each one. We used React JS and PHP with the website. And for the application, we used React Native and PHP. For the database we used MySQL. We built the application first. We made the front end of the patient's screens and linked them. Then for the main functionalities that related just to the patient, we wrote the back-end code and connected it with the database. After that, we worked on the front-end doctor's screens. When we worked on the back end for doctors, we finished the main functionalities first. Then we worked on the shared screens between the patient and doctor like schedule, appointments, prescription, and others. Next, we built the website. We began with the admin pages, then the last page for lab workers. We programmed them to connect to the same database as the application.

1.1 Overview of Report

In this report, we will show our work. We will start with chapter 2 Constraints and Earlier course work. In this chapter, we talked about the issues and hurdles we ran into at the start of the project and throughout the process. We also talked about projects and courses that helped us enhance our skills and expertise, which showed up in the project's progress. The next chapter is Literature Review. In chapter 3 we looked at several similar works as well as what makes ours unique. Then we narrow our focus to specific project components and discuss the extra functionality in our project. The fourth chapter is the Methodology chapter. Here, we discuss the strategy of this project, from collecting the features, selecting the design, and starting to build the screens for the application and the website and connecting them with the database. The chapter before last is Results and Analysis where we present and discuss our final findings. The last chapter is the Conclusions and Recommendation where we argued and discussed our findings.

2 Constraints, Standards/ Codes and Earlier course work

2.1 Constraints

2.1.1 Learn new frameworks

We used React JS and React Native to build the front end for our project, this is our first time dealing with frameworks. It took a lot of time to learn. Also, we had to learn es6, to make the coding easier. We learned the basics but through the work, we needed to deal with many libraries to complete our work. The difficulty was the semester was short which made it hard to learn these frameworks and complete the entire project.

2.1.2 Routing between pages

We used React Navigation to link our screens. But since our application has many screens and most of them are linked with each other, it was hard to organize routing and move between different pages.

2.2 Earlier Courses

2.2.1 Database course

This course helped us a lot when we collected the data and selected the relation between tables. It made it easier when we built tables and selected the database type.

2.2.2 Web development course

This course was the base of our work. We used HTML, CSS, and JavaScript to program the front end and PHP for the back end. And knowing enough about JavaScript made it easier to learn React JS and work with it.

2.2.3 React JS and React Native

We took a React JS course before and through the semester. It helped us a lot to understand React hooks and React routing. For React Native we read its tutorials and watched videos, and use it to implement our work.

3 Literature Reviewn

These days, with technological evolution and the demand for healthcare facilities increasing, you can easily find Doctor Appointment Apps. for instance HealthPlix SPOT is a popular app for doctors. Also, there's the Zocdoc App which offers valuable healthcare for patients. It has top-rated care doctors. Another example is Sminq, which is booking online appointments with doctors. Most of these applications focus on one side. Some of them are for doctors only and others for patients only. In addition, these Applications are general. They focus on online appointments. Our app is made for people who need to go to clinics. It seeks to provide services for the outer clinics in the hospital. our Application is not unique and incomparable, but it has many features. It's joining doctors and patients. Doctors can add their schedule, determine their work days and cancel appointments. they will have all the information about their patients, and they can write prescriptions for them. For patients, they can book and cancel appointments. They can choose their doctor and they can see others' reviews about the doctor and appointments. Clinics App stands out from similar services because it is comprehensive and presents many options in a single application.

4 Design and Implementation

In our project, we focused on making an application and a website joining every feature needed by the patient and the doctor. And to make it easier we split the users. The application will collect two users who are the patient and the doctor. And the website will be for two other users who are the admin, the lab worker. Then we built our database and selected the relation between tables. Since there are many relations on our database project we use MySQL database. After that, we chose to build the frontend using react for the website and react native for the application. but the backend we use PHP for both. We decided to work with react and react native because they are really common and don't have many problems.

4.1 The application design

We started with the application and searched for the design of the screens. Depending on the functionalities we made screens that patients and doctors can sign up and sign in. then we implement home screens for both. Other screens are also designed for what patients and doctors need. For example, if the patient needs to see a doctor, he will go search for the best one, so we made a screen that shows the doctors sorted by their rate. Then we focused on how the patient and doctor will be connected. If the patient can book an appointment the doctor selects his schedule the way it suits him. Another example is if the patient needs a prescription the doctor will write it and send it to the patient. for each functionality, we implemented a screen.to write the code we start with the frontend for the patient's screens, the backend for the patient's screen, the doctor's screen frontend, and finally the backend for the doctor's screens .

4.2 The website design

We built the website for the admin,and lab workers. each one has his profile so they have to sign up and log in except the admin who already has an account. We started with the front end for the pages and we used bootstrap which gives available components and doesn't need to build many of them from scratch. We made the admin pages so he can control adding doctors and clinics. He can read every data on the application and be aware of each process. For the lab worker, since the doctor needs to have the medical files for his patients we add the lab worker. We give him the ability to send the files to the doctor. We built the website for the admin,and lab workers. each one has his profile so they have to sign up and log in except the admin who already has an account. We started with the front end for the pages and we used bootstrap which gives available components and doesn't need to build many of them from scratch. We made the admin pages so he can control adding doctors and clinics. He can read every data on the application and be aware of each process. For the lab worker, since the doctor needs to have the medical files for his patients we add the lab worker. We give him the ability to send the files to the doctor.

4.3 Implementation

4.3.1 Key Library

Server Side:

• MySQL

MySQL is a relational database management system (RDBMS) created by Oracle. It is based on structured query language (SQL) and it is the most popular open-source database. It is used in a variety of applications such as data cleaning, data warehousing, e-commerce, and logging applications. it can be associated with any scripting language such as PHP. We used it for our application and website because our data has many relations and its elements have specific properties.

• PHP

PHP(short for Hypertext PreProcessor) is the most widely used open-source and general-purpose server-side. It is a scripting language used mainly in web development to create dynamic websites and applications. almost 79

Client Side:

• React JS

React.js framework is an open-source JavaScript framework and library developed by Facebook. It's used for building interactive user interfaces and web applications quickly and efficiently. React is used to build single-page applications and it allows us to create reusable UI components. We used to build the frontend for our website.

• React Router DOM

React Router DOM is an NPM package that makes it possible to integrate dynamic routing into web applications. You may use it to show pages and let users traverse them. It is a routing framework for React with all the features

so it is used to create single-page apps. We used it for routing between pages on our website.

• React Bootstrap

React-Bootstrap is a component-based library that provides native Bootstrap components as pure React components. We used some of these components on our website. like tables, and cards.

• React Chart

Chart.js is the most popular library used for creating charts. We used this library to show finances on our website.

• React Native Expo

React Native Open-source technology developed by Facebook for mobile applications. It is utilized to create apps for Android, iOS, and the web. And Expo is a framework for creating React Native applications. It is a group of services and tools. We utilized it to create the application's front end.

• React Navigation

React Navigation is a library that allows the implementation of navigation functionality in a React Native application and offers many components. We used it for routing between the application's screens.

• Axios

Axios is a library that serves to create HTTP requests that are present externally. It is used for making REST API calls. We utilized it with React and React Native to import the data.

• React Native DateTime Picker

React Native Modal to pick a date or a time. This library exposes a cross-platform interface for showing the native date-picker and time-picker inside a modal. We used it so the doctor can pick time for his schedule.

• React Native Calendar

It's a library that offers a calendar modal in React Native. We use it so the doctor can select his workdays in the application. Also, it allows the patient to pick the day for booking his appointments.

4.4 Tools

• Visual Studio Code

VS Code is a free code editor. It helps the programmer write code. It is developed by Microsoft and supports the macOS, Linux, and Windows operating systems. VS Code's tools can be used to enhance the functionality of any written code. We use this editor to implement our code.

• Android IDE

Android Studio is the IntelliJ IDEA-based official Integrated Programming Environment (IDE) for Android app development. Android Studio provides many features to increase productivity when developing Android applications. it provides a fast and feature-rich simulator. We used its virtual device manager to simulate the application.

• XAMPP

XAMPP is the most popular PHP development environment. It is a free, open-source, Apache distribution for Windows that provides a handy environment for developing web applications. It is used to serve web pages on the Internet. It can also be used to create and manipulate databases in MariaDB

and SQLite, among other databases. We use it as a server for our database in our project.

5 Results and Analysis

We compiled the source code starting from the frontend and then the backend for both the website and the application. We worked step by step to implement each page and make it flexible and easy to deal with the users. And we made sure that everything is working well. before we move to the next step. That helps us a lot to determine where the errors come from. In the final stage, our project fulfilled the requirements related to it. so the patient can use the application to book his appointments, see his prescription, give his reviews and rate the doctor. and the doctor can make his schedule, write prescriptions and cancel appointments.

5.1 Clinics Application

5.1.1 Shared Screens

•onboarding screen

This screen has a slider showing an introduction for the application. It displays the main features and gets the user into the application. When it's finished, he can use the application and get the best experience. After this screen he has two options: sign in or sign up.

Figure 1: onboarding screen

• sign in screen

Before the user can use the app's services, he needs to log in. He will enter his email and password. if they are correct, this screen will route him to his home page. Sign in screen is for the patient and the doctor. It routes them to their account using their emails. So, the doctors have different email types than the patients.

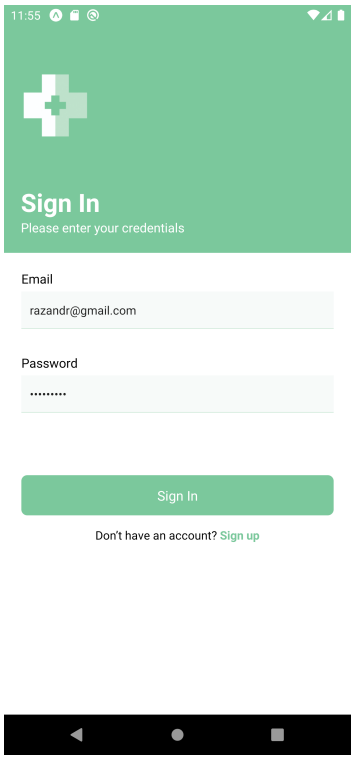

Figure 2: sign in screen

5.1.2 Patient's screens

• Patient Sign up Screen

If the patient doesn't have an account to log in he needs to register from this page. He should enter his info and click sign up. then he will have an account to sign in.

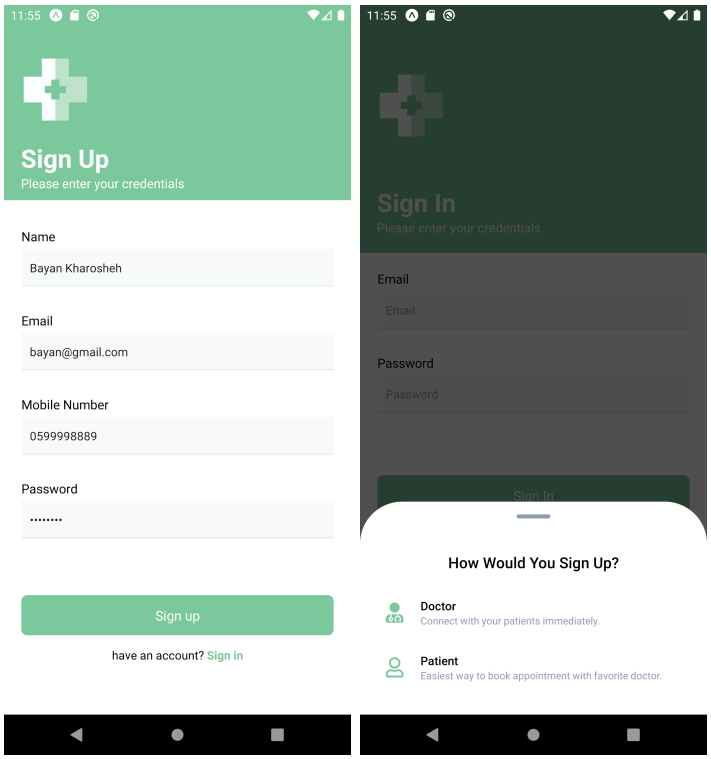

Figure 3: Patient Sign up Screen

• Patient History screen

This screen appears after the patient logs in. It's a slider, each slide contains a question, and the patient has to answer them. This info will be saved and appear for the doctor when he needs it.

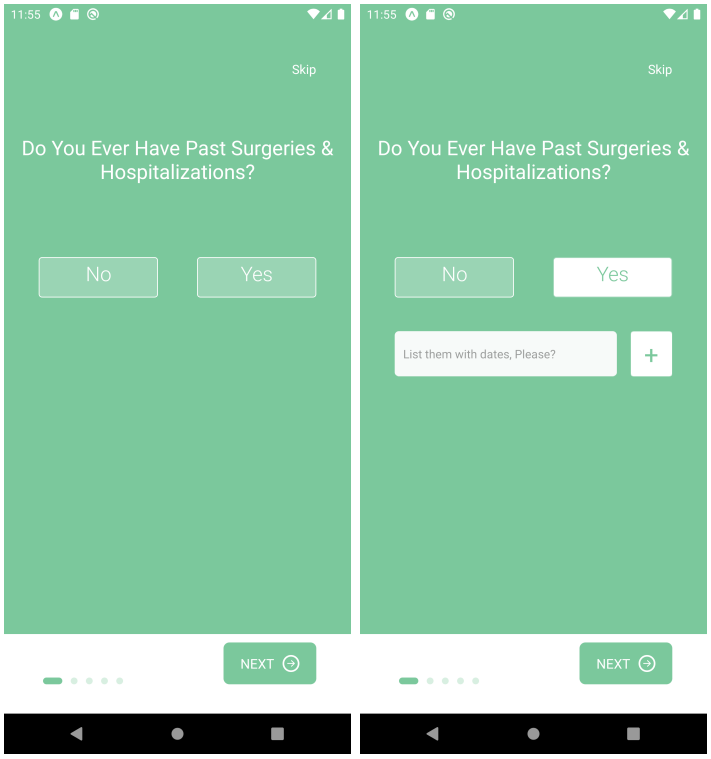

Figure 4: Patient History screen

• Home screen

This screen displays main cards that route to other screens. The first card gives him the accessibility to view the doctors. The second one shows all the outer clinics. The third one displays his appointment and the last one is for the list of his prescriptions. Also, this screen has a navigation menu. It's a menu with four tabs, the first one shows his profile. The second one is to see the paid and not paid bills. The third one shows his messages screen, and the last one is the home screen tab.

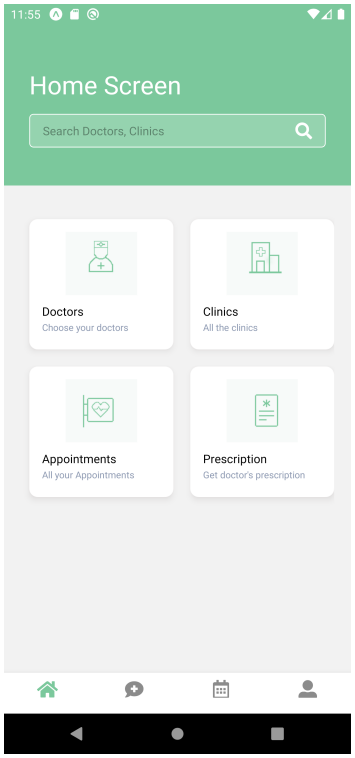

Figure 5: Home screen

• Doctors screen

When he opens this screen, two tabs and a search bar will appear. The first tab shows all the doctors in the clinic and the second tab shows the doctors who the patient had an appointment with. The doctors will appear sorted depending on their rates. So, the doctor with the highest rate will be on the top and the lowest on the bottom. Also, the patient can use the search bar to search for any doctor.

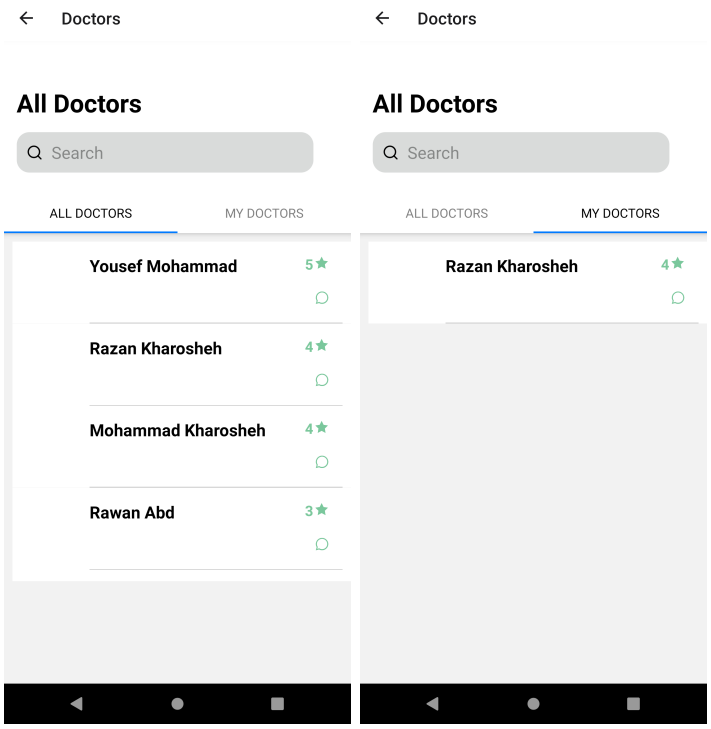

Figure 6: Doctors screen

• Clinic Screen

This screen displays all the clinics and a search bar. All clinics will appear for the patient and when he clicks on one of them it will route him to its doctors. And using the search bar, he can find any clinic he wants.

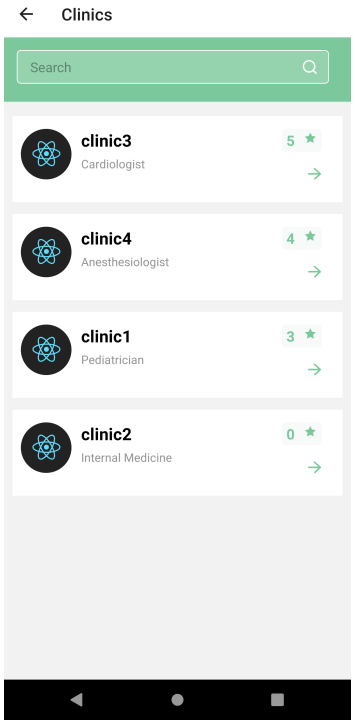

Figure 7: Clinic Screen

• Doctor Profile Screen

When he chooses the doctor from the doctors' screen or after clicking on a specific clinic, the doctor profile screen will display. This screen gives the patients many choices. From this page he can choose to have an appointment with this doctor, he can display the others' reviews about him, or can move to chat with this doctor.

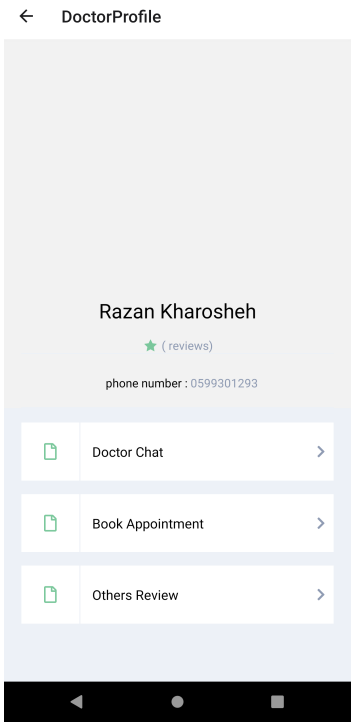

Figure 8: Doctor Profile Scree

• Book Appointment Screen

When the patient wants to book an appointment with a specific doctor, he will click on his profile and choose the book appointment tab. this screen will appear, and it will show all the days that have an available appointment. If he clicks on one of these days, the available appointments appear with their times. He can choose the appointment and confirm the booking.

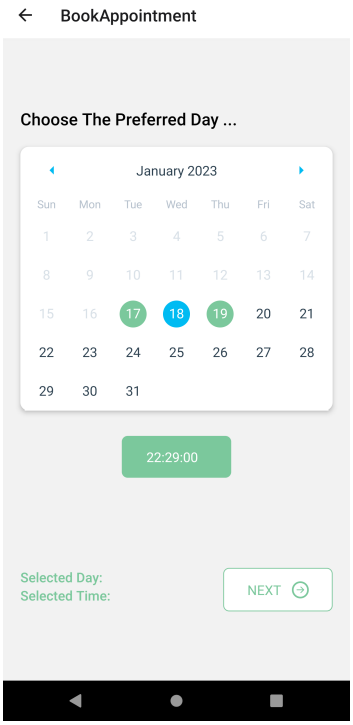

Figure 9: Book Appointment Screen

• Payment Screen

This screen appears after the patient chooses the appointment time. He needs to choose the payment method for this appointment by clicking on cash or visa. If he chose the visa, he should enter the visa id and password.

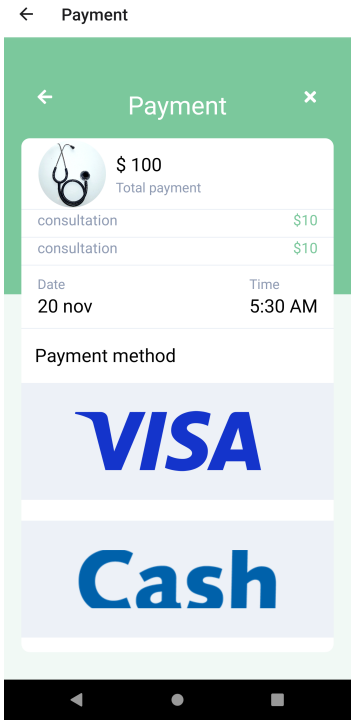

Figure 10: Payment Screen

• Reviews Screen

if the patient clicks on the "other reviews" tab in the doctor profile, this screen will appear. This screen contains all the reviews of other patients who had an appointment with this doctor.

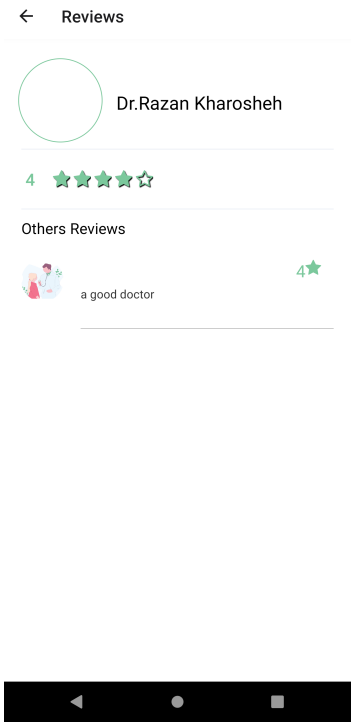

Figure 11: Reviews Screen

• Appointments Screen

On this screen, the patient will see all his appointments. There are two tabs, one for upcoming appointments and the second for past appointments. The patient can cancel any upcoming appointment. And, for the past appointment, he can write his review and rate it.

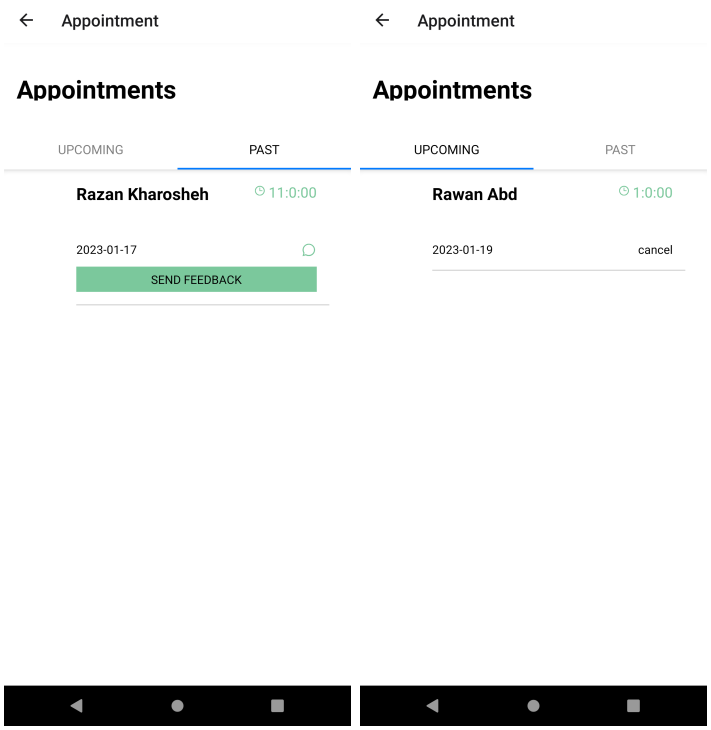

Figure 12: Appointments Screen

• Write Review Screen

This screen gives the patient the ability to write his review and rate the doctor after the appointment finishes. it appears after click on each past appointment on the appointments screen

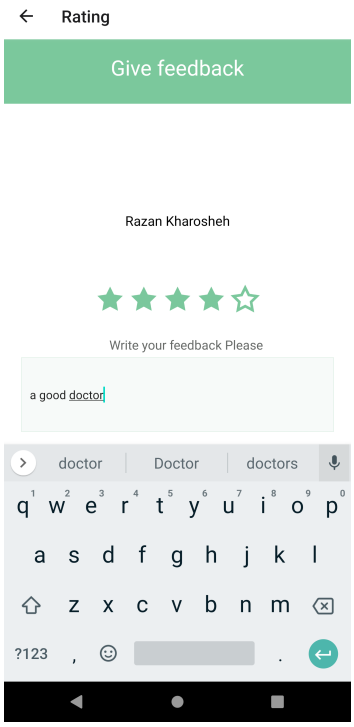

Figure 13: Write Review Screen

• Prescriptions list

After each appointment, the doctor will write a prescription for the patient. This prescription is shown in a list on the prescriptions screen with its details.

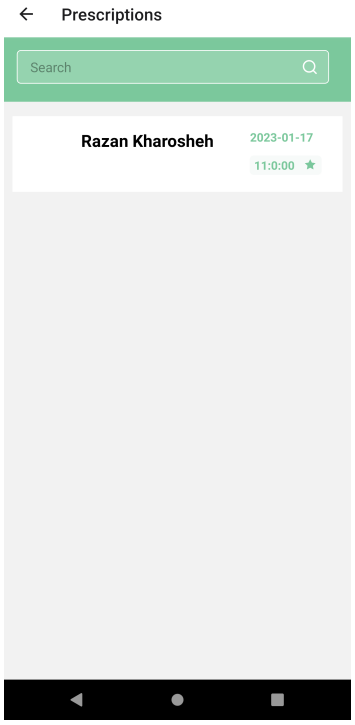

Figure 14: Prescriptions list

• Prescriptions Screen

After the appointment finished and the patient had a new prescription on the prescriptions screen. He can display the prescription and see its details on this screen.

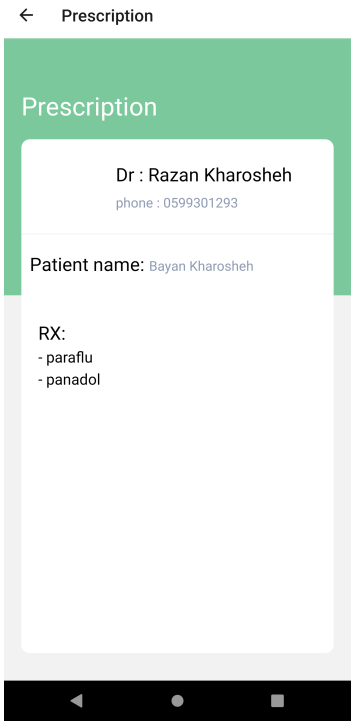

Figure 15: Prescriptions Screen

• Profile Screen

This screen shows the patient's info and it routes him to two other screens. screen for editing the profile and another one for announcements.

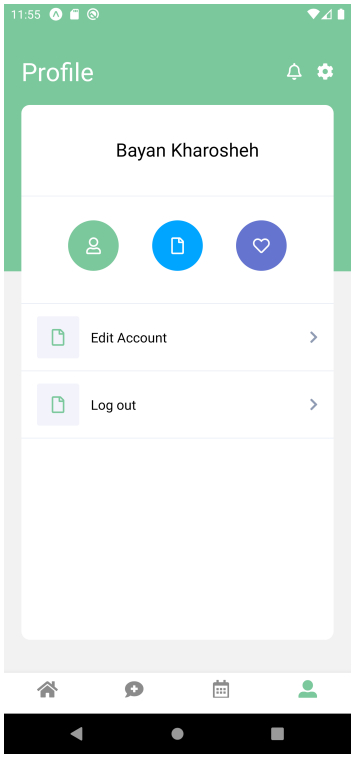

Figure 16: Profile Screen

• Edit Page Screen

After the patient enters his info to sign up, the info will appear in his profile. And he can edit them from the edit screen page.

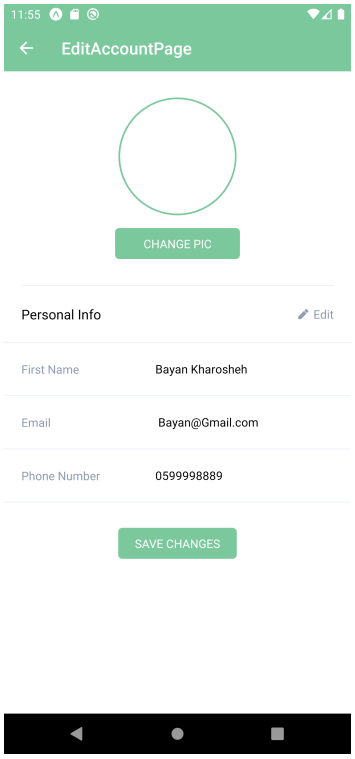

Figure 17: Edit Page Screen

• Announcement Screen

If the doctor cancels the appointment, this screen will display an announcement to tell the patient about the cancelation.

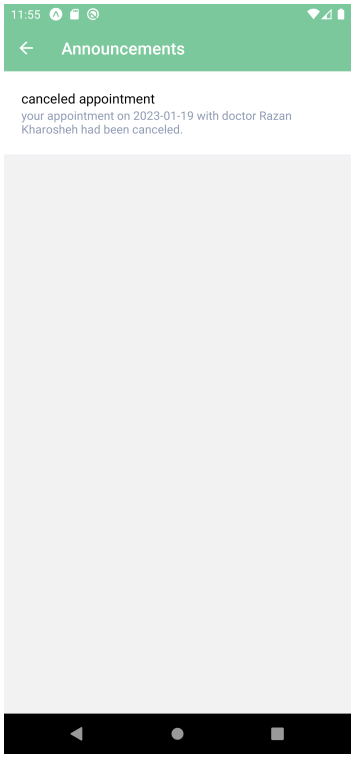

Figure 18: Announcement Screen

• Bills screen

This screen shows all the bills the patient paid or not. When he books the appointment and chooses the payment method the bill will appear. The bill will appear as not paid if he clicked the cash. And appear as paid if he clicked the visa and entered its correct info.

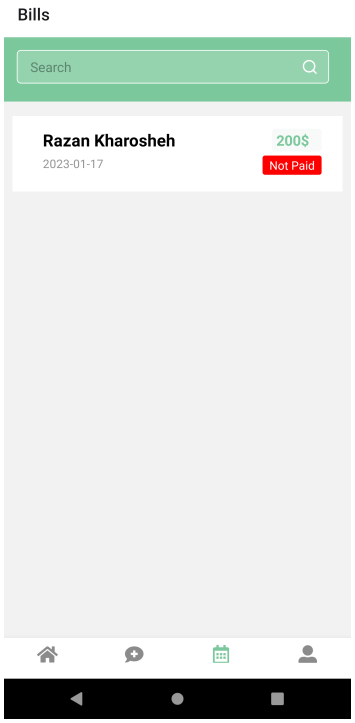

Figure 19: Bills screen

5.1.3 Doctor's screen

• Doctor Sign up Screen

If the doctor doesn't have an account to log in he needs to register from this page. He should enter his info and click sign up. then he needs to wait until the admin confirms his account to sign in.

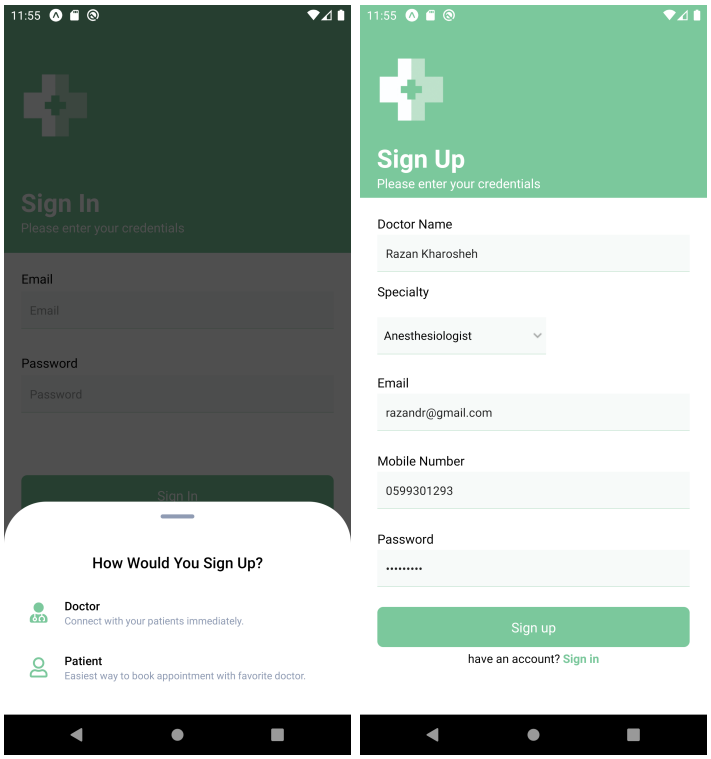

Figure 20: Doctor Sign up Screen

• Home screen

This screen displays main cards that route to other screens. The first card gives him the accessibility to view the patients. The second one shows all the reviews from his patient. The third one displays his appointment and the last one is for the list of lab messages. Also, this screen has a navigation menu. It's a menu with four tabs, the first one shows his profile. The second one is for selecting his schedule. The third one shows his messages screen, and the last one is the home screen tab.

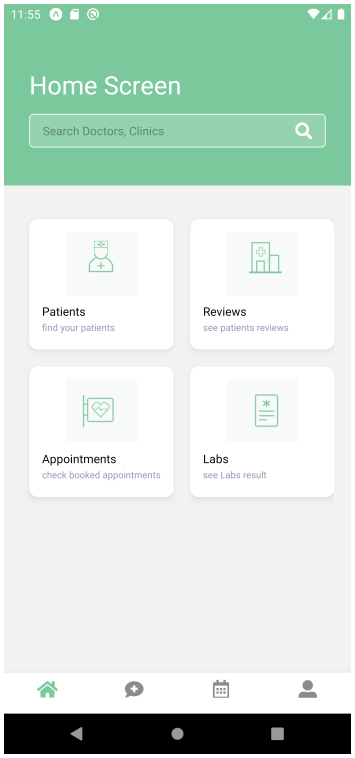

Figure 21: Home screen

• Patients screen

When he opens this screen he will see all the patients who have an account in the application. It has a search bar too, the doctors can use it to search for any patient.

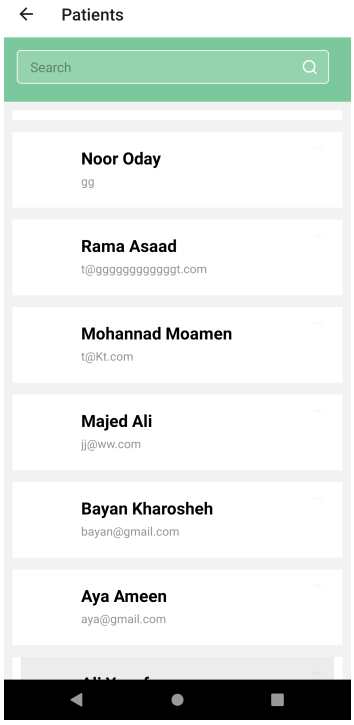

Figure 22: Patients screen

• Patient Profile Screen

When the doctor chooses the patient from the patient's screen, the patient profile screen will display. This screen gives the doctor many choices. From this page, he can see the patient's history and he can delete the account. This page can route the doctor to chat with the patient too.

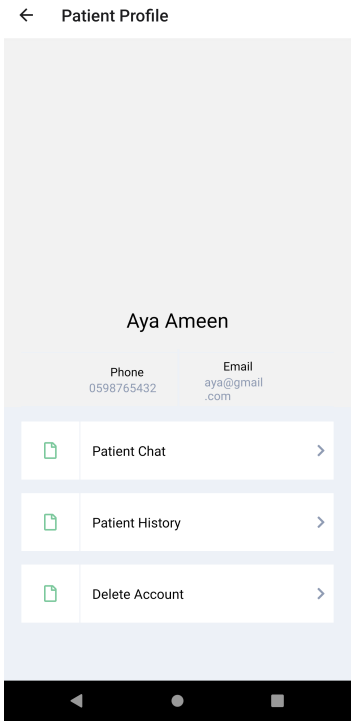

Figure 23: Doctor Profile Screen

• Patient history screen

If the doctor wants to see the patient's history he will display this screen. It shows the patient's history. every question, and its answers.

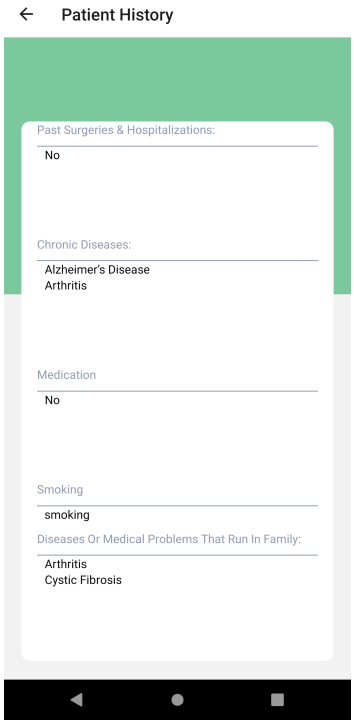

Figure 24: Patient history screen

• Reviews Screen

When the doctor displays this screen, he will see all the reviews from his patients who had an appointment with him. Also, it displays his rating value.

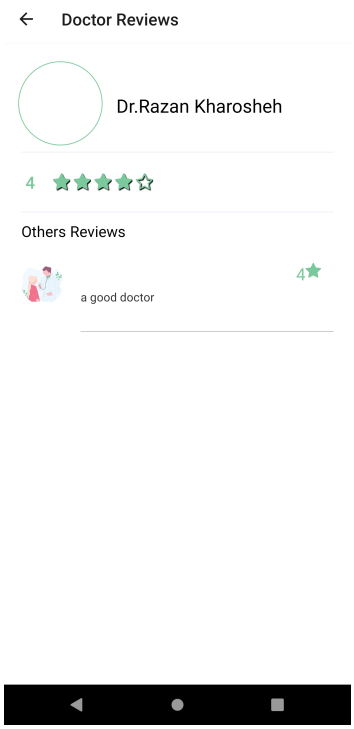

Figure 25:Reviews Screen

• Appointments Screen

On this screen, the doctor will see all his appointments. There are two tabs, one for upcoming appointments and the second for past appointments. The doctor can cancel any upcoming appointment. And, for the past appointment, he can write the prescription for the patient.

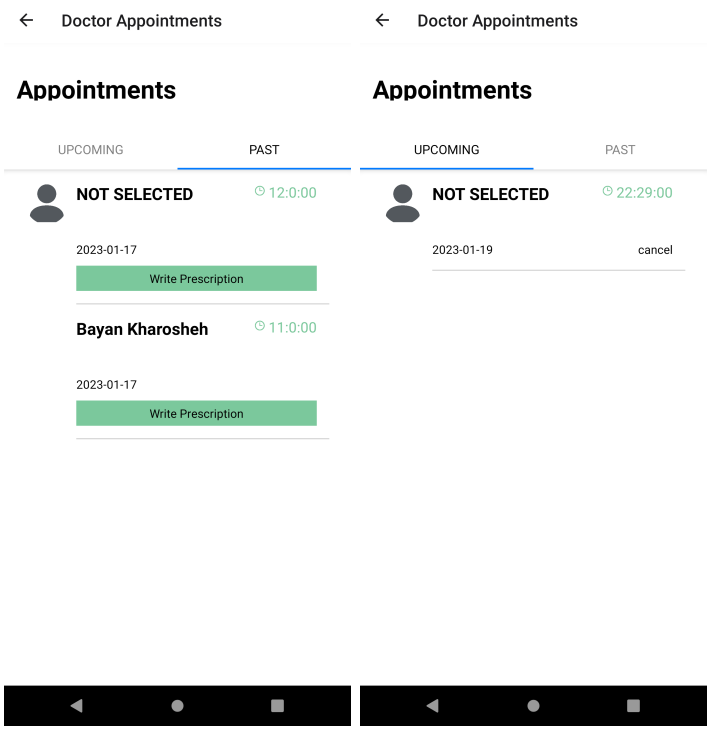

Figure 26: Doctor Appointments Screen

• Write prescription Screen

This screen gives the doctor the ability to write the prescription for the patient after the appointment finishes. it is routed from each past appointment on the appointments screen

Figure 27: Write prescription Screen

• Labs Screen

This screen shows a list of all the messages. These messages are sent by lab workers. and it contains a medical file for a specific patient.

Figure 28: Labs Screen

• Profile Screen

This screen shows the doctor's info and it routes him to two other screens. screen for editing the profile and another one for announcements. Also, it has a tab that allows the doctor to determine his bill.

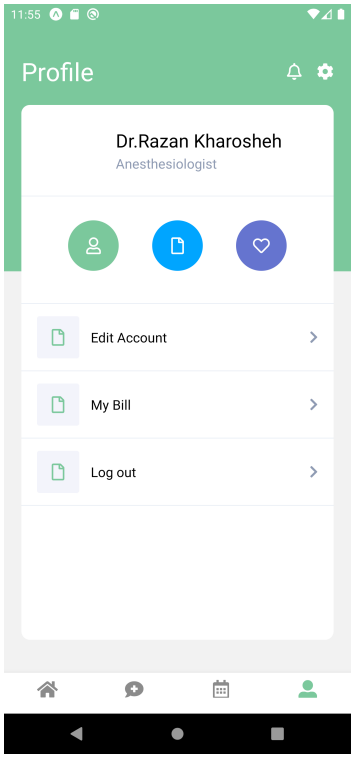

Figure 29: Profile Screen

• Edit Page Screen

After the doctor enters his info to sign up, the info will appear in his profile. And he can edit them from the edit screen page.

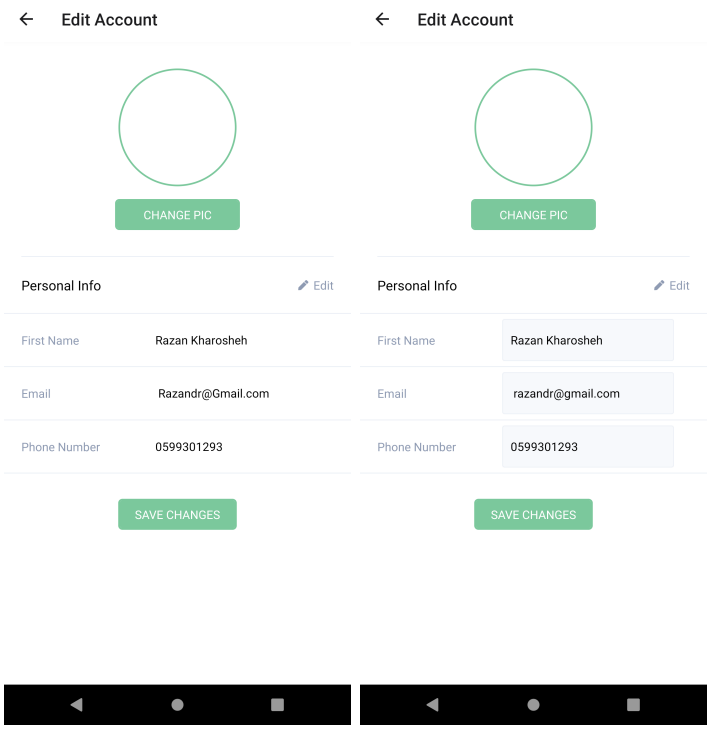

Figure 30: Edit Page Screen

• Announcement Screen

If the patient cancels the appointment, this screen will display an announcement to tell the doctor about the cancelation.

• Schedule Screen

The doctor can determine his schedule from this screen. He can choose the day for work and then add an appointment time. every day with a schedule will be colored and when the doctor clicks on it all the appointments will appear.

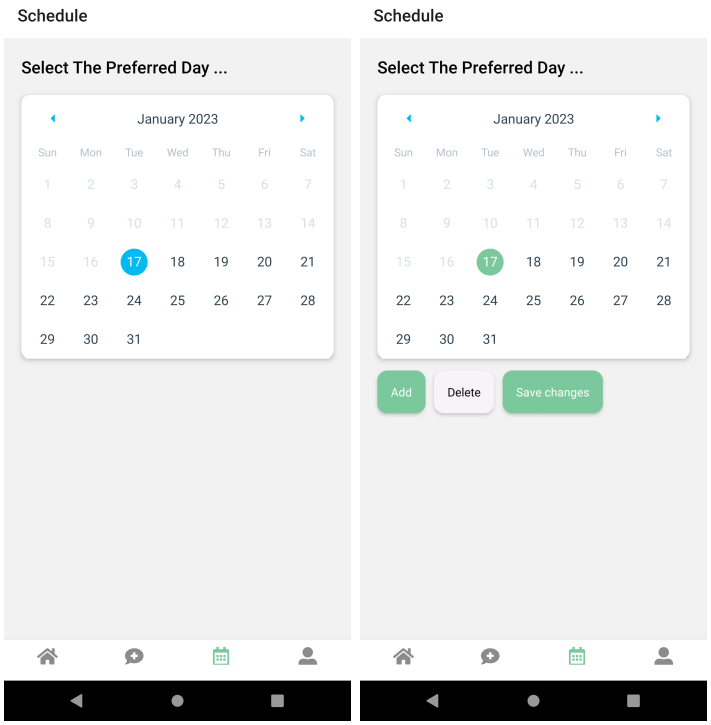

Figure 31: Schedule Screen

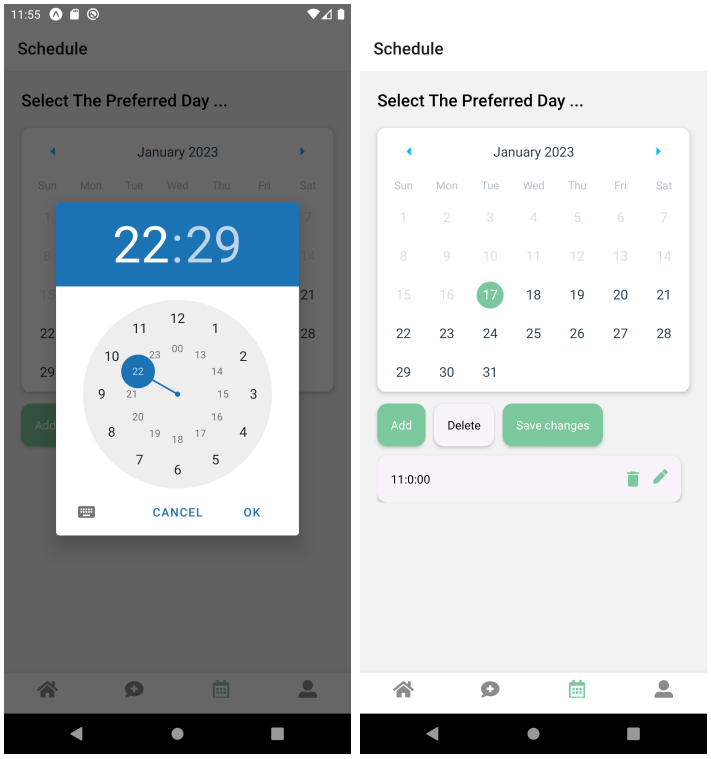

Figure 32: Schedule Screen

• Messages screen

This screen shows the list of patients who had or will have appointments with the doctor.

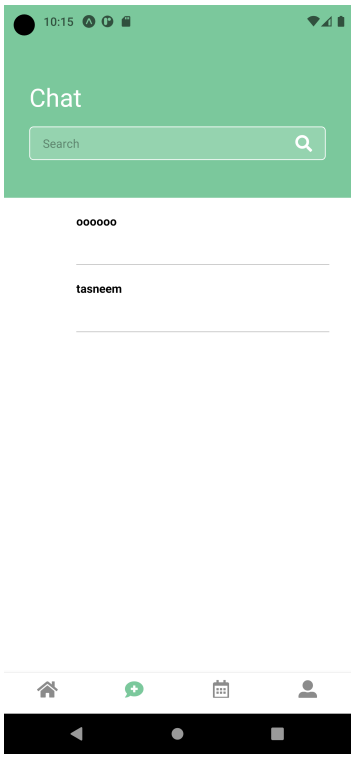

Figure 33: Messages screen

•Chat screen

When the doctor clicks on chat with this patient from the patient profile screen or from the messages screen, this screen will appear. He can write a message for the patient and show the received one.

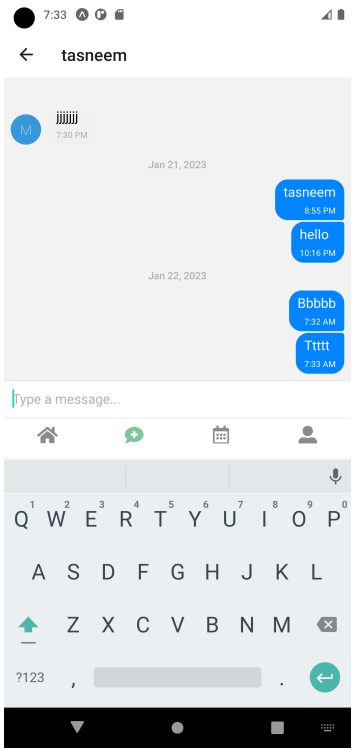

Figure 34: Chat screen

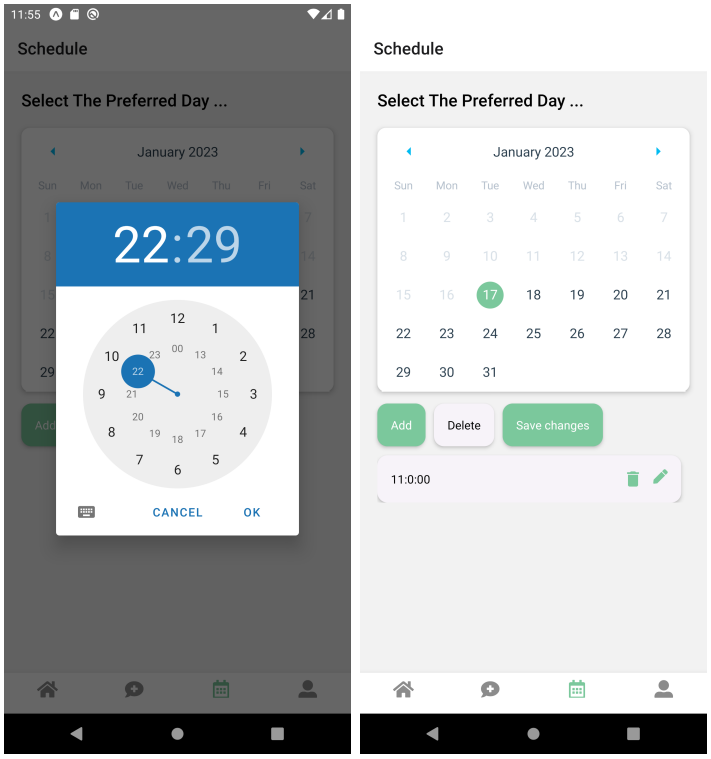

Figure 32: Schedule Screen

5.2 Clinics Website

5.2.1 Shared Pages

• Sign in Page

The users of the website should log in to get the different services. They will enter Their email and password. If they are correct, this screen will route them to their pages. Sign-in page is for all types of users. It routes them to their account depending on their emails.

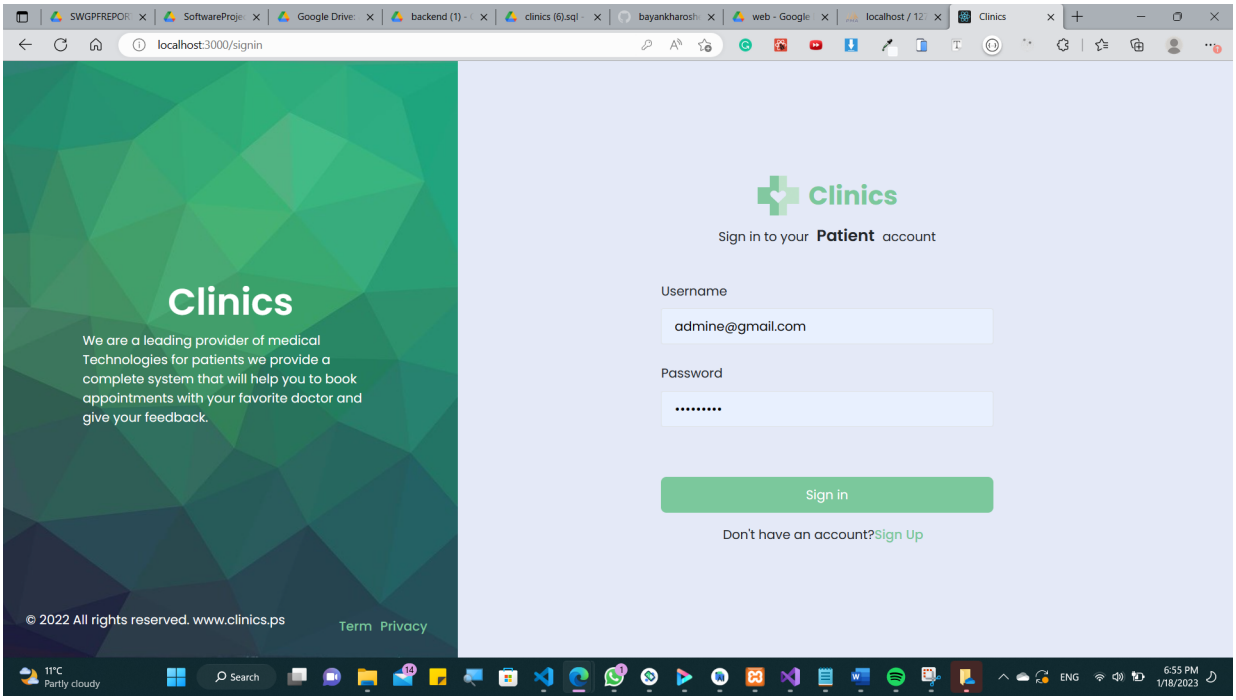

Figure 35: Doctor Sign up Screen

• Sign up Page

This page is for lab workers , so they can register and have an account to use the website.

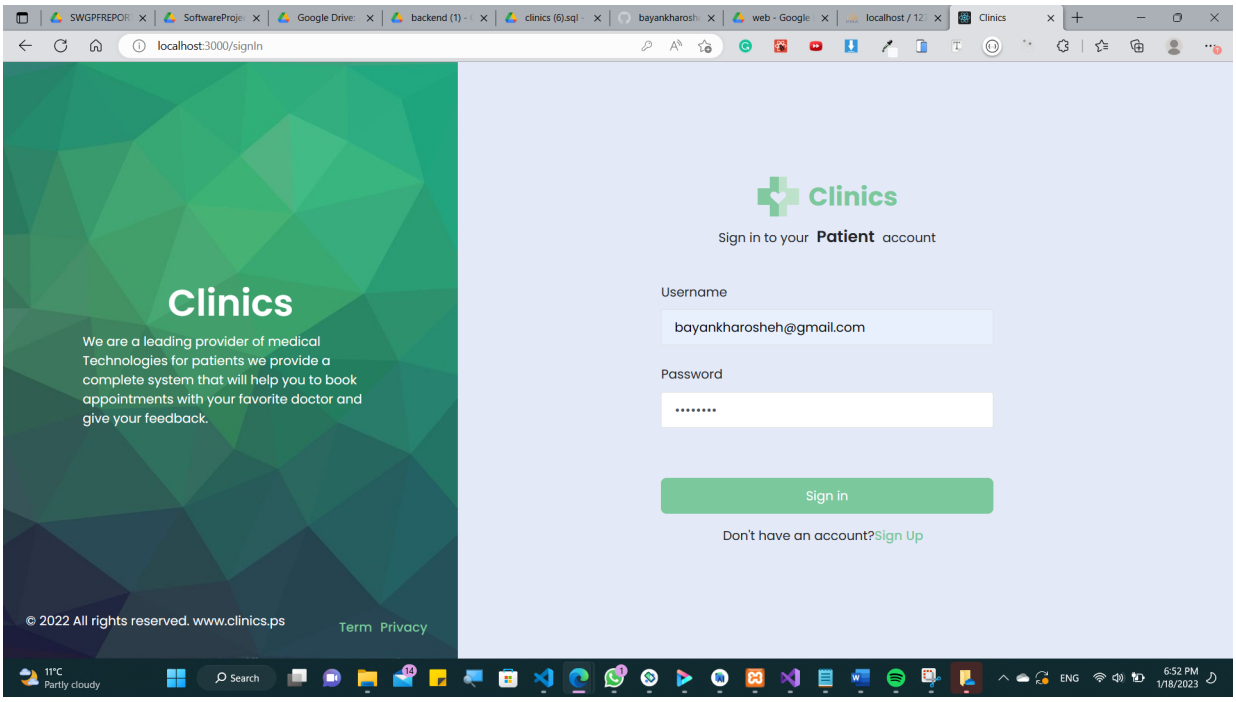

Figure 36: Sign up Page

5.2.2 Admin Pages

• Dashboard Page

From this page, the admin will get the summary of the outer clinic's status. This screen shows the number of doctors, patients, and appointments in all clinics. Also, it displays a chart showing the financial situation of each clinic. And it shows a table for today's appointments. There's also a side nav on the left that helps the admin move between all pages.

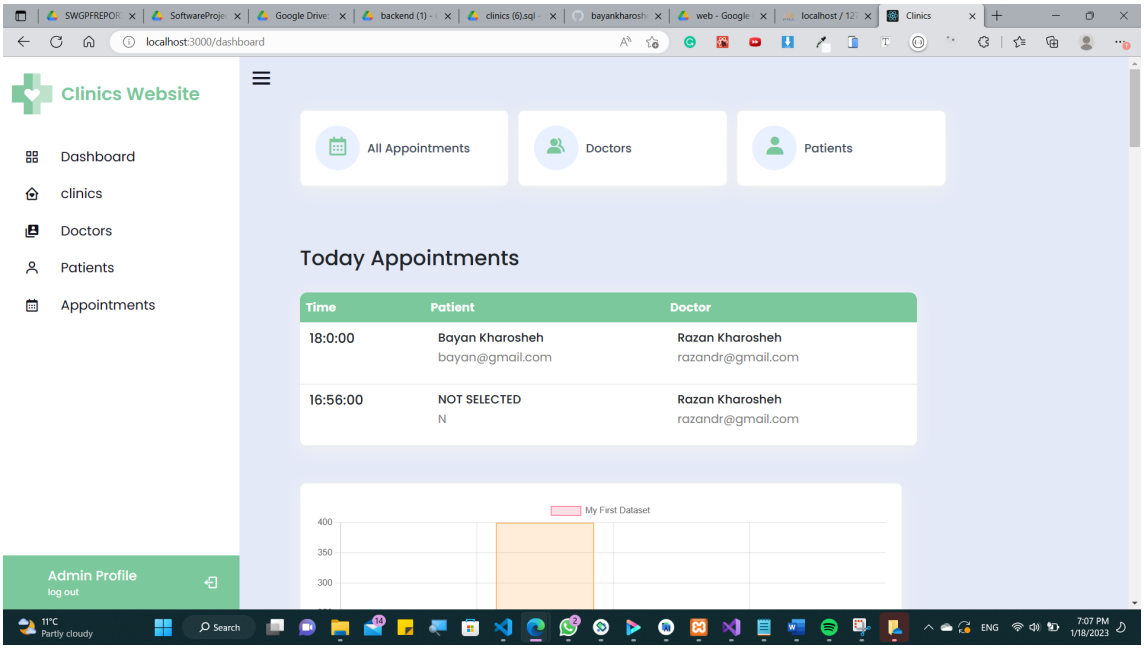

Figure 35: Dashboard Page

• Clinics Page

This page allows the admin to add a new clinic. He needs to enter its info and click add. This page also has a table showing all the outer clinics. If the admin wants to delete a clinic he can.

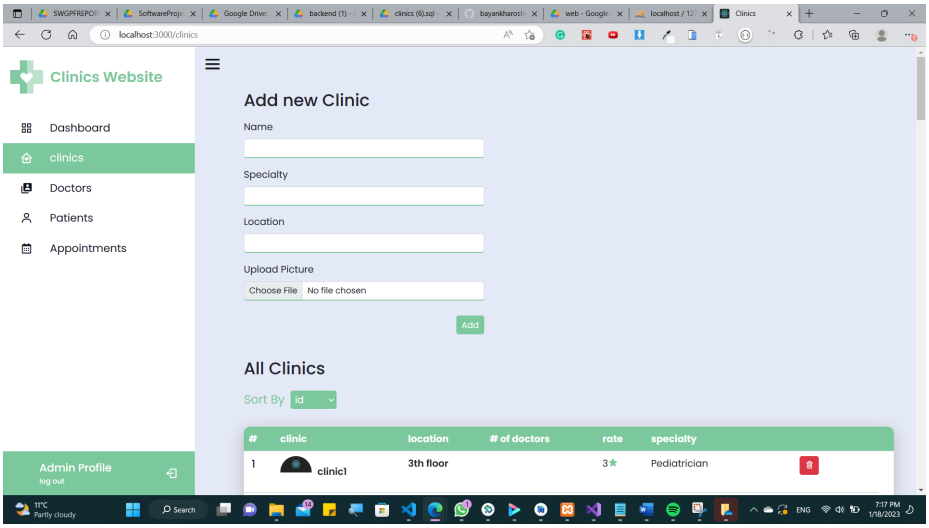

Figure 38: Clinics Page

•Doctors Page

This page has two tables. The first table shows the new doctors who registered from the application. and the admin can confirm their accounts. if they had the confirmation they can use the application else they should check admin. The second table displays all doctors with their info. He can sort them by their names, IDs or rates

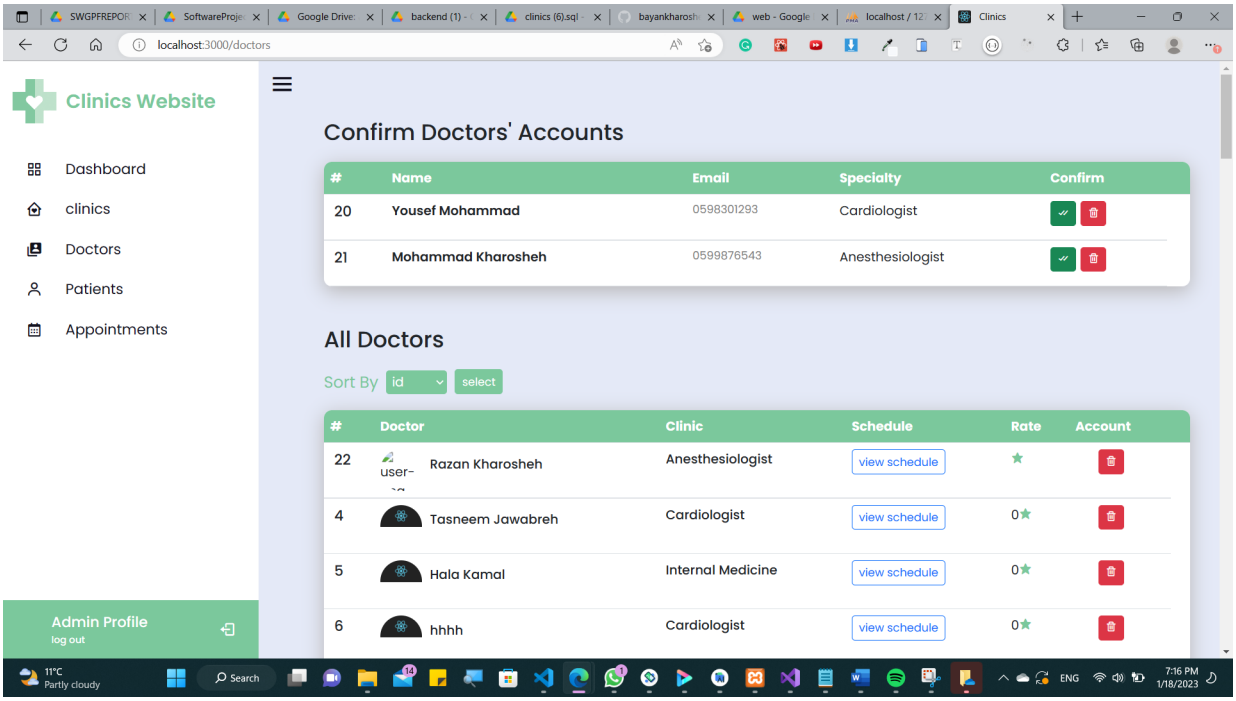

Figure 39: Doctors Page

•Doctor Schedule Page

when the admin clicks on the view schedule for a doctor from doctors' tables, this page will appear. and it will show the full schedule for the doctor.

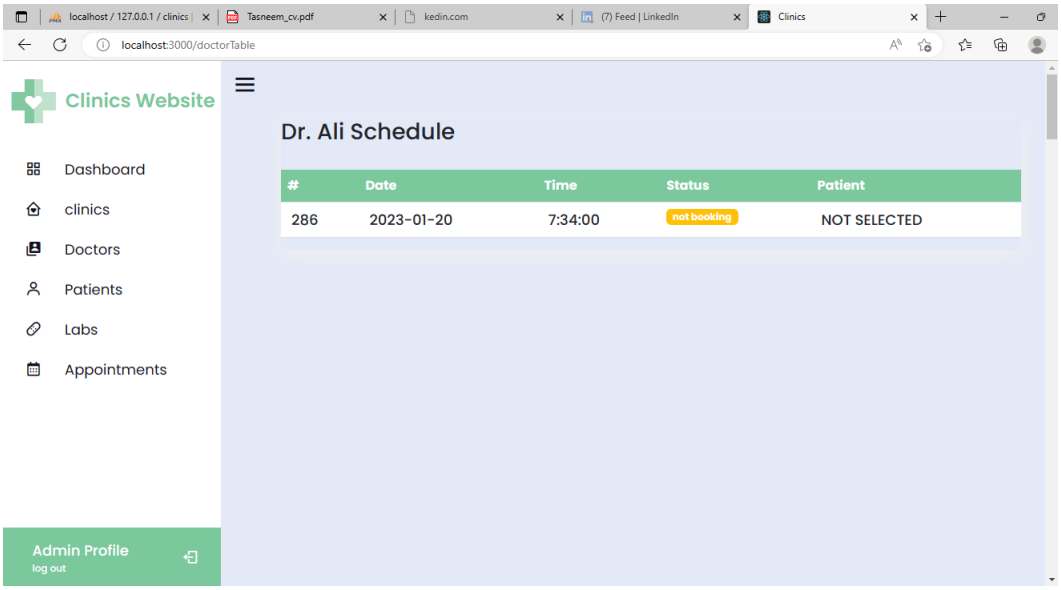

Figure 40: Doctor Schedule Page

• Patient Page

The admin can use this page to display all the patients in the clinics. He can also click on their medical histories. He can sort them by their names, or IDs. also he has the ability to delete them from the system.

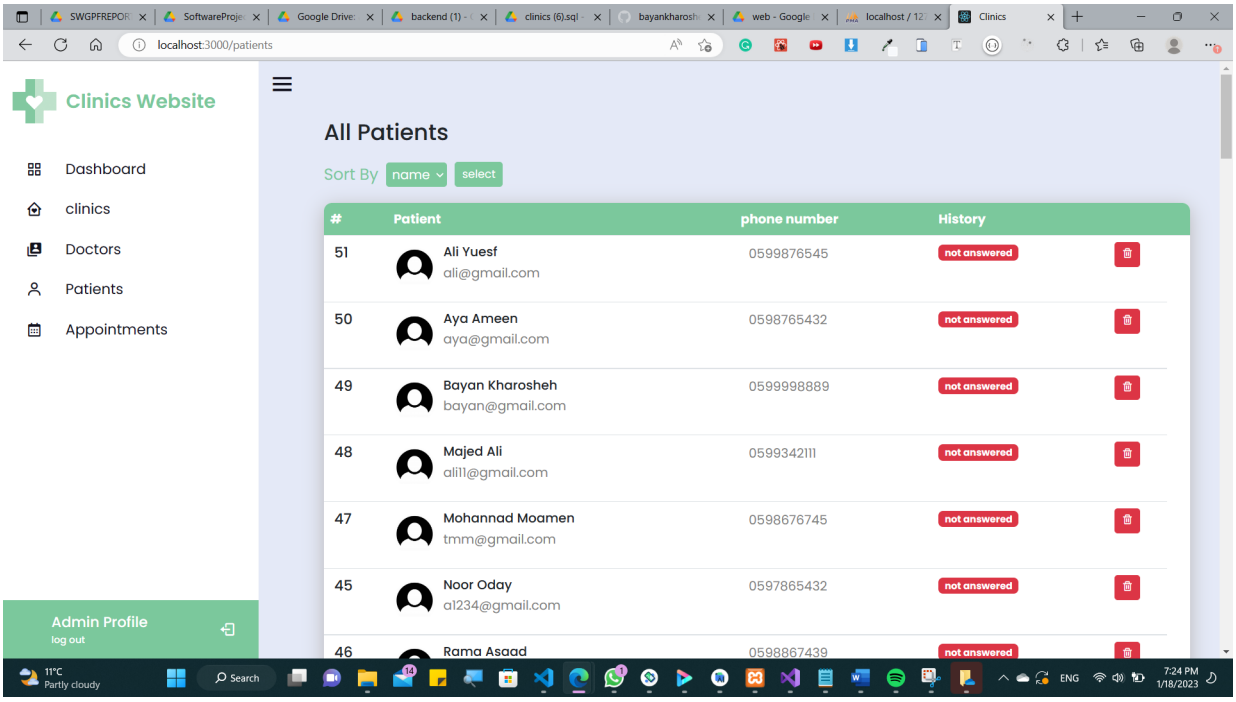

Figure 41: Patient Page

• Patient History Page

This page shows the medical history of a specific patient. they sorted in the table each question with their.

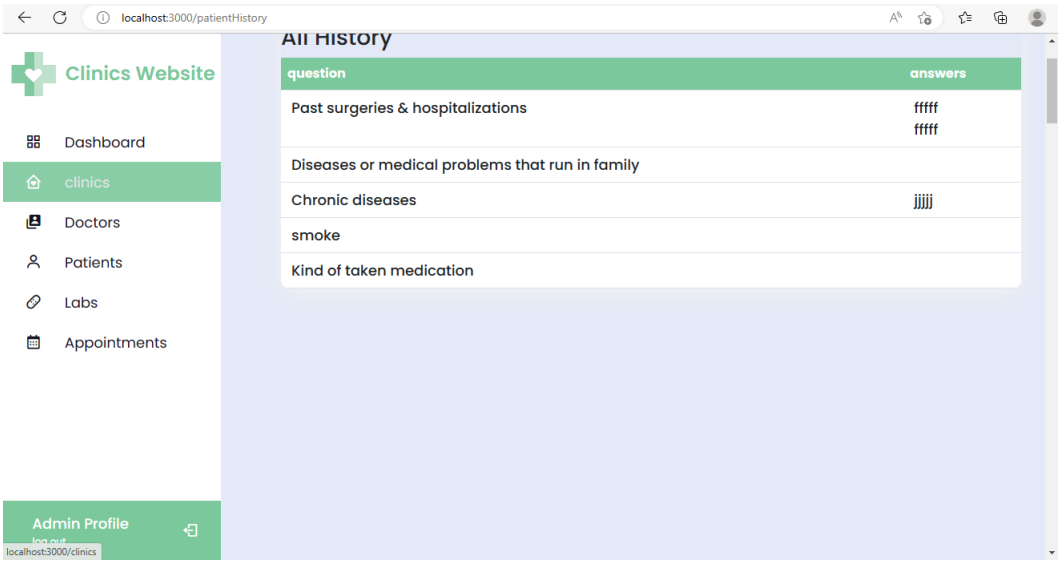

Figure 42:Patient History Page

• Appointments Page

From this page the admin can see all the appointments in 2 different tables. One shows the upcoming appointment and the second one shows the past appointment. Also, it shows if the appointments are booked or not.

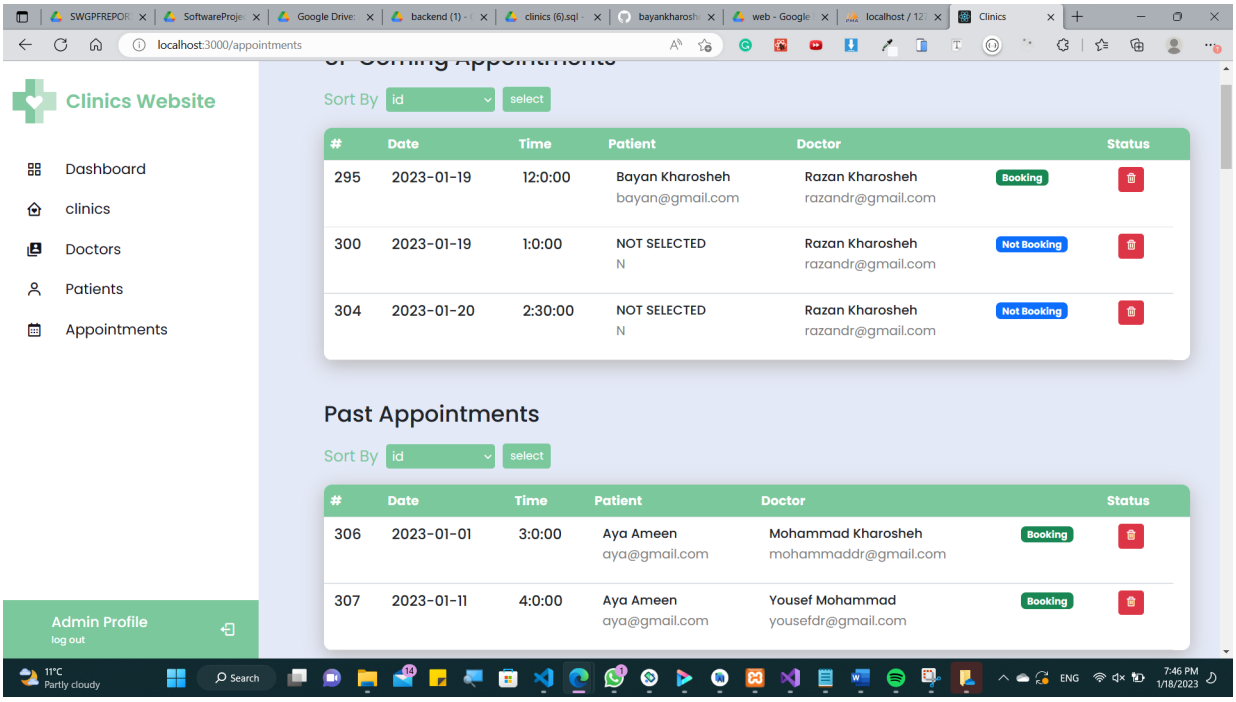

Figure 43:Appointments Page

• Lab Worker Pages

This page is shown after the lab worker logs in. It allows him to send the medical files to a doctor. He needs to select the doctor and write the patient's name, the message, and select the file.

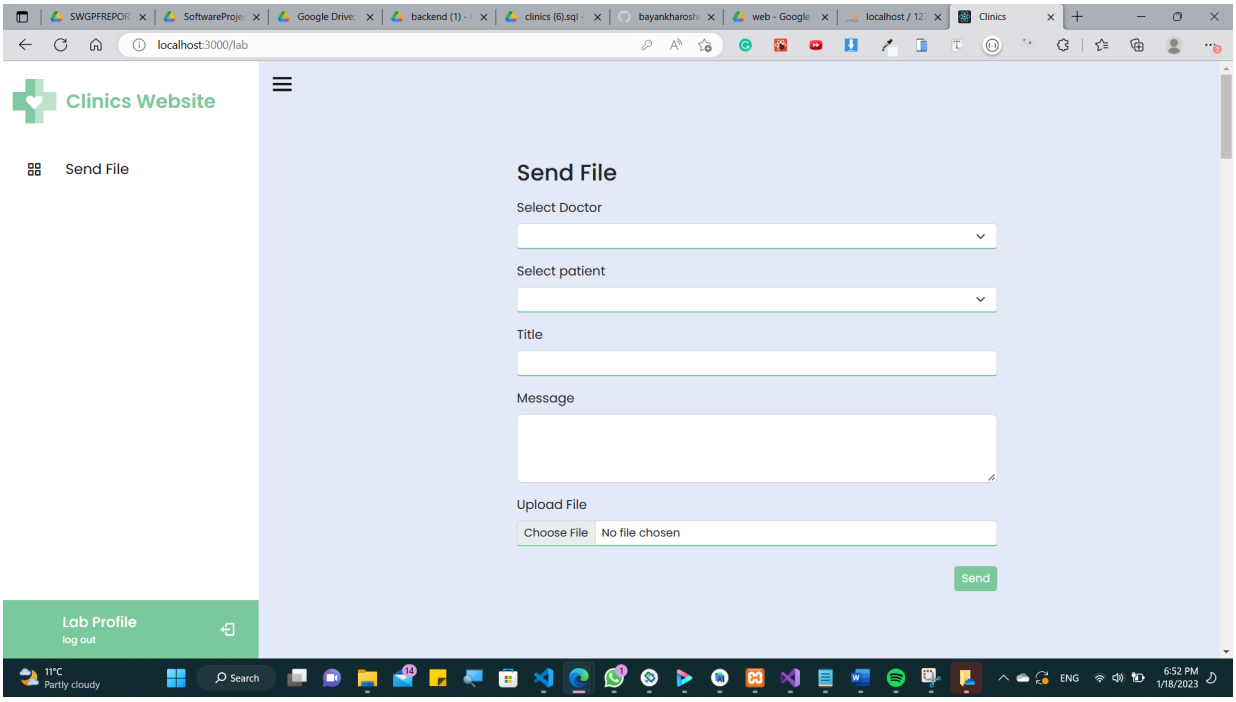

Figure 44:Lab Worker Pages

6 Conclusions and Recommendation

With the improvement and increase in smartphone sales over the past several years, people utilize mobile applications to accomplish their tasks and make their lives simpler. Applications for smartphones may be found in a variety of categories, including entertainment, education, health, etc. In our project, we built an application and a website to make it easier for patients and doctors. It is for outer clinics in a specific hospital. The application helps the patient to choose his doctor, book appointments, get his prescription, give reviews, and more features. The doctor also can easily get the patients' info, write prescriptions, make schedules and cancel appointments at any time.in addition, the website gives the admin the control to organize these processes. We can improve our application to make it available for more clinics and work for more hospitals. We can add pharmacies, so they can use the application and give the patient their medicines.