



Information
Technology
Institute

Medical Center

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Intake 42

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1. Introduction

1.1. Background

Medical history of any patient is very important for doctors to know in order to reduce any possible complications. However, many patients may not realize the importance of mentioning their medical history or getting their old prescriptions. Therefore, the Medical Center project is mainly about keeping the medical history of any patient available to the doctors to get all medical details of their patients. This system contains of patients, doctors, pharmacists, laboratories, radiologists and an admin. Moreover, this website provides an appointment system to ease the booking process between patients and doctors.

First, patients are able to get any doctor visit summary through this system in terms of prescriptions, doctor diagnosis, and required medical checkups and download the results once uploaded. Furthermore, patients can view the available slots for any doctor in any category then choose the preferred time to book, cancel after booking or edit an appointment. In parallel, medicines are always recorded so no need for the paper prescriptions anymore because their medicines for every visit are visible to pharmacists.

Second, doctors can search for patients by their id to get their medical history and to add a visit summary, so no need for doctors to use paper prescriptions anymore. Also, doctors can check easily their reserved slots and view the rating they got by their patients.

Third, the laboratory and radiologists can view the required type of medical analysis or radiology for each patient and upload their results, so that users can access their results effortlessly. In addition to that, in case of any mistake happened they can edit the file to upload the right version.

Finally, admin is responsible of managing accounts in terms of employees and doctors' registration or deleting their accounts. In addition, controlling doctors schedule, and they are able to manage the medical reports in terms of deleting and updating.

1.2. Purpose

o For Patients:

- show/search for doctors in all available categories.
- book/edit /delete appointments online.
- view their medical history.
- search for a specific visit by date.
- rate their doctors

o For doctors:

- Check their booked appointments.
- Record all the patients visit details in terms of medical analysis, radiology and medicines.
- Search for patients and show their medical history easily.
- view their ratings done by patients.

- o **For Laboratories and For radiologists:**
 - upload the medical analysis/radiology results to patients easily.
 - edit the uploaded medical analysis/radiology results.
- o **For pharmacists:**
 - view the required medicine for each patient.

1.3. Competitors Analysis

- o There are two competitors found in the Egyptian market which are: Vezeeta and DoctorUna.
- o the main features of Vezeeta and DoctorUna are almost similar and can be summarized as those patients are able to search, compare and book appointments online. However, comparing to the Medical Center system, keeping patient's medical history and visit summary features are missing.

1.4. Customers Analysis

- o Medical center is designed to be extendible , convenient, and applicable to suit the needs of potential customers.
- o The potential customers are:
 - Admin
 - Doctor
 - Patient
 - Pharmacist
 - Radiologist
 - Laboratory technician

1.5. Scope

- o Our website is a great opportunity to be familiar with the medical history of patients.
- o Admin can register or delete any employee from/off the system. Also, he can control the doctor's schedule.
- o Patients have the chance to view all categories of doctors and book an appointment with any of them. Before and even after going to the doctor, they can cancel or change the appointment if they need to. When they visit the doctor and after he writes the prescription for them, it will be recorded in the patient's medical history, so they can rate the doctor which they visited, and they can go to the pharmacy to buy the medicines they need or go to the lab to do the required tests or x-rays without having to take any documents with them. Also, they can view their medical history and their profile.
- o Doctors have the chance to view their appointments with the priority of who came first and to view their patients' medical history and their profiles in addition to the written prescription for them during the visit. Once Doctors write the prescription, it's stored in the medical history of patient through the application. After that, they can edit this prescription if they need to. Also, they can view their working schedule and their profile.
- o Radiologists and Lab technicians have to upload the results of x-rays or medical tests as pdf to medical history of patients so that the doctor can see them through application.
- o Pharmacists can view the prescription of the patient to give them the medicine they need.

1.6. Business Model

o What do you do? How is it unique?

- Interactive, easy to use website where they users can benefit from browsing on it.
- Our website will help people of all ages, especially the elderly, to get medical history easily.
- We aim to create a medical platform where doctors , pharmacists, lab technicians, and Radiologists can find an easy interaction with patients.
- Appointment system will strengthen the trust between doctors and patients.
- Doctors will be able to record or edit their prescriptions for patients easily.

o How will we reach our target audience?

- Well-known Hospitals or clinics.
- Social Media Platforms: Facebook, Twitter and Instagram.
- Well-known Doctors.

2. Requirements

2.1. Functional Requirements

- o End-user can register as a patient.
- o Admin can register, delete 2 roles (doctor and employee).
- o Admin can control doctor schedule.
- o Patient and doctor can view, edit their profiles.
- o Patient and doctor can view patient's medical history and can search on it.
- o Patient can view all categories of doctors with their info and can make, change, and cancel an appointment with any of them.
- o Doctor can view his working hours.
- o Doctor can view his appointments with patients and search on it.
- o Doctor can record, edit, search prescription for patients.
- o Radiologists and Lab technicians can add results of medical tests or x-rays.
- o Pharmacists can view the prescription of the patient with specific doctor.

2.2. Use Cases

2.2.1. Actors

- o Admin
- o Doctors
- o Patients
- o Radiologists
- o Lab Technicians
- o Pharmacists

2.2.2. List of use cases (Services)

o **Admin can**

- Register doctor and employees.
- Delete accounts of doctor and employees.
- Control Doctor schedule.
- Update and delete results of medical tests and x-rays.

o **Doctor can**

- View his profile.
- Edit his profile.
- View his working hours.
- Search for specific appointment.
- Search for specific patient by name or Id.
- View medical history of patients.
- Record Prescription for patient.
- Edit his Prescriptions.
- Search for specific prescription.

o **Patient can**

- View his profile.
- Edit his profile.
- View his Medical history.
- Search for specific prescription.
- View Doctors' Categories.
- Search for specific doctor.
- View working hours of doctor.
- Make an appointment.
- Change an appointment.
- Cancel an appointment.

o **Pharmacist can**

- View specific patient's prescription.

o **Radiologist and Lab technician can**

- Upload results of medical tests and x-rays.

2.2.3. Use case diagrams

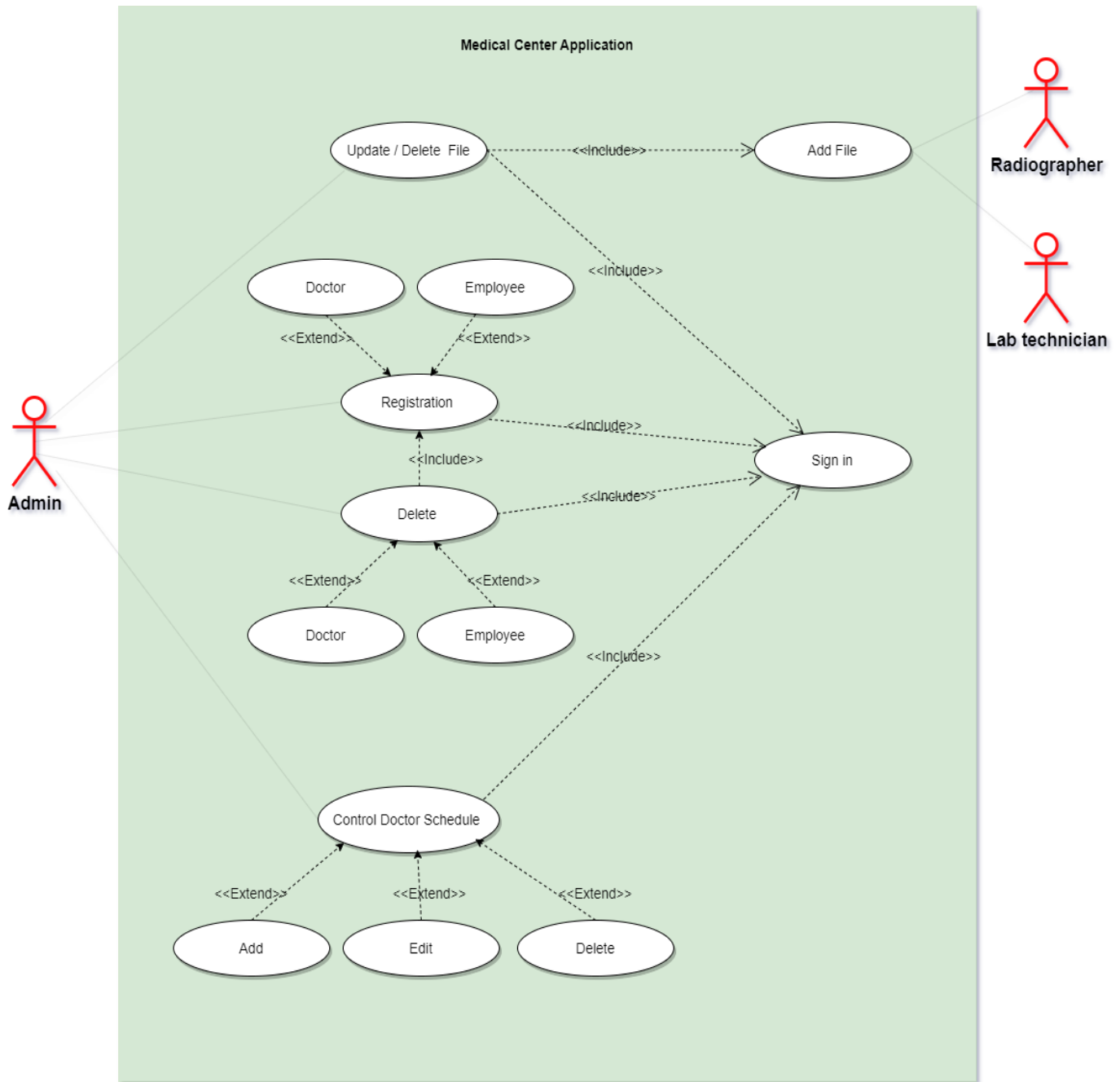


Figure 2.1 Admin

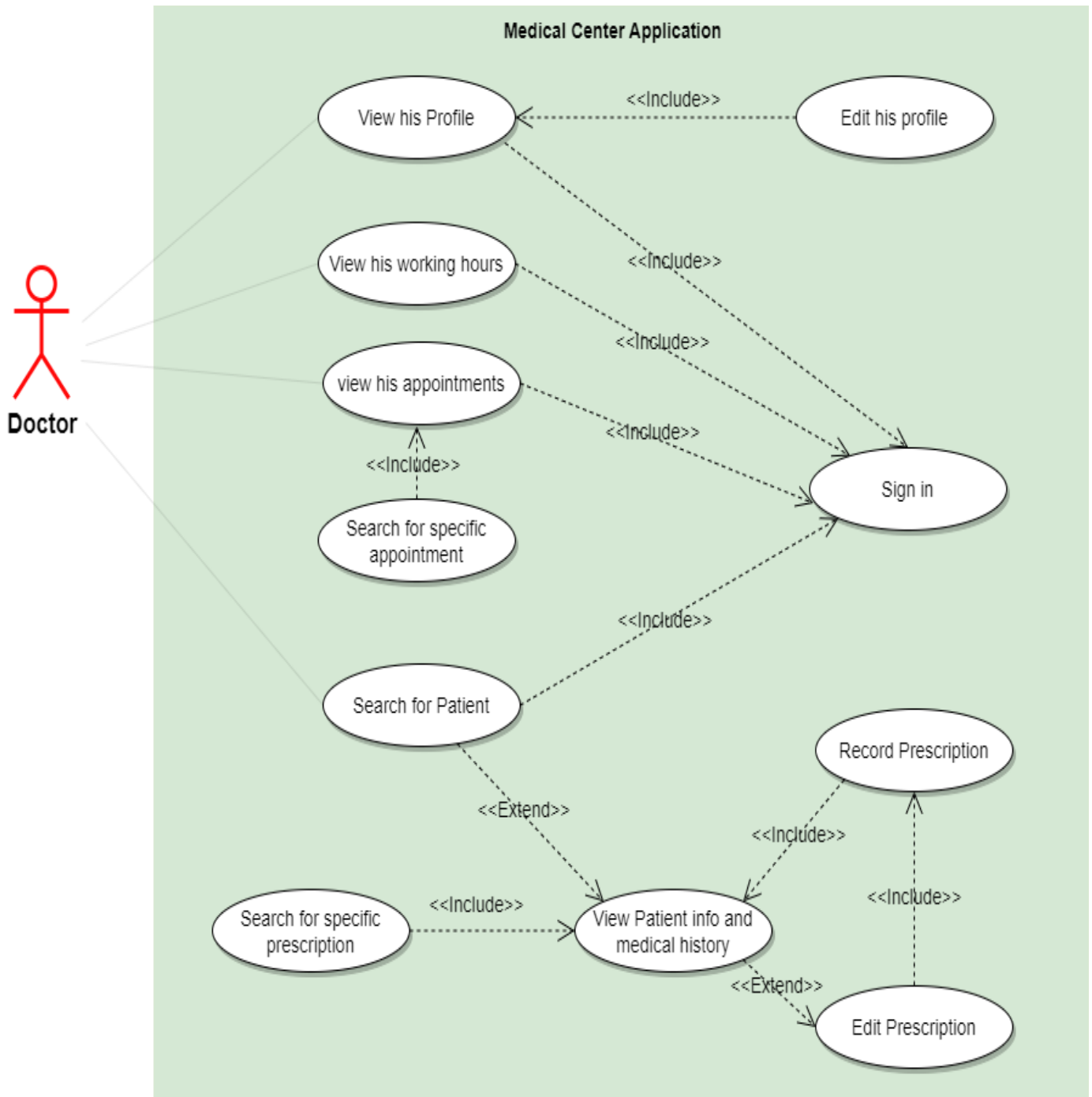


Figure 2.2 Doctor

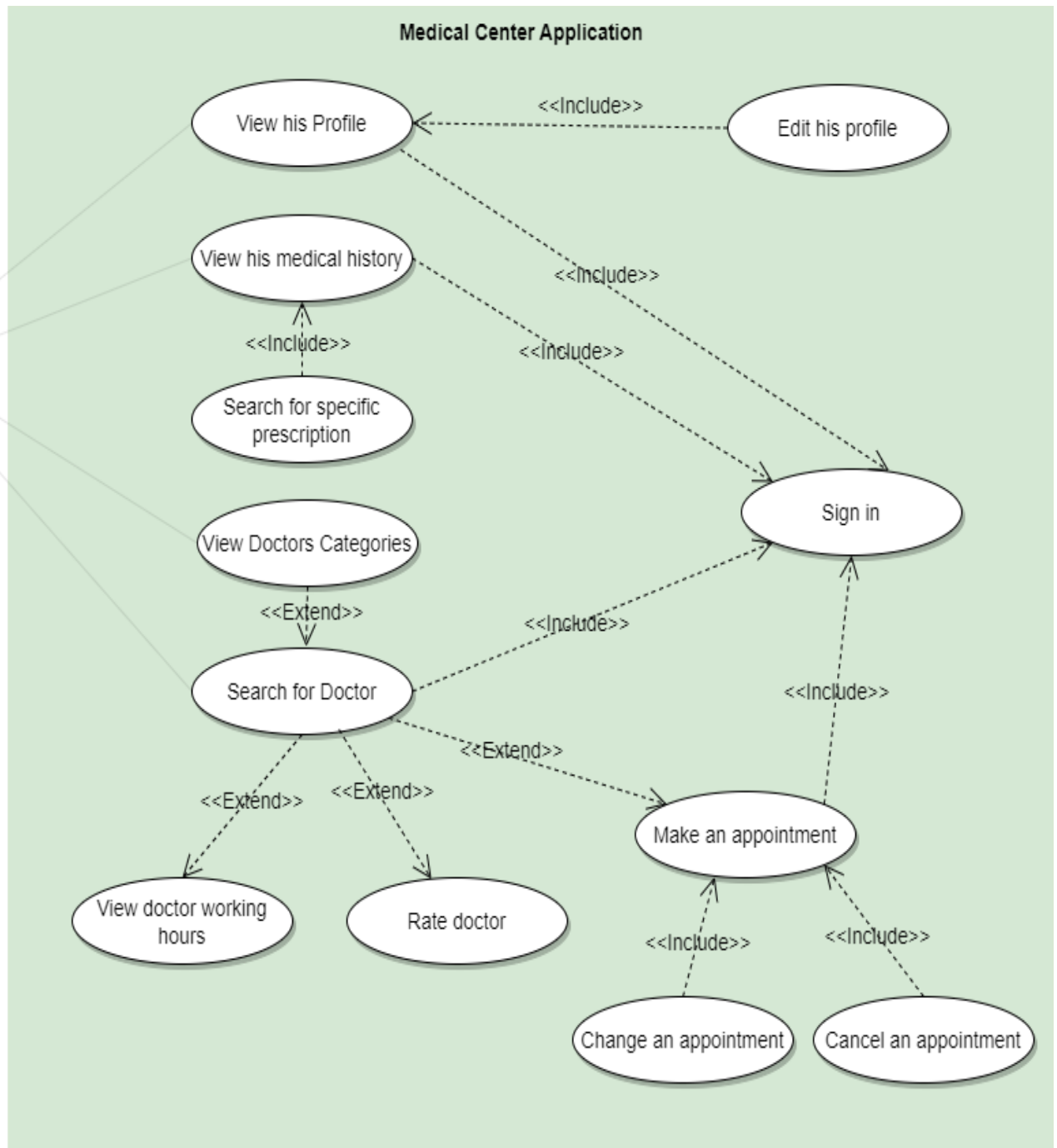


Figure 2.3 Patient

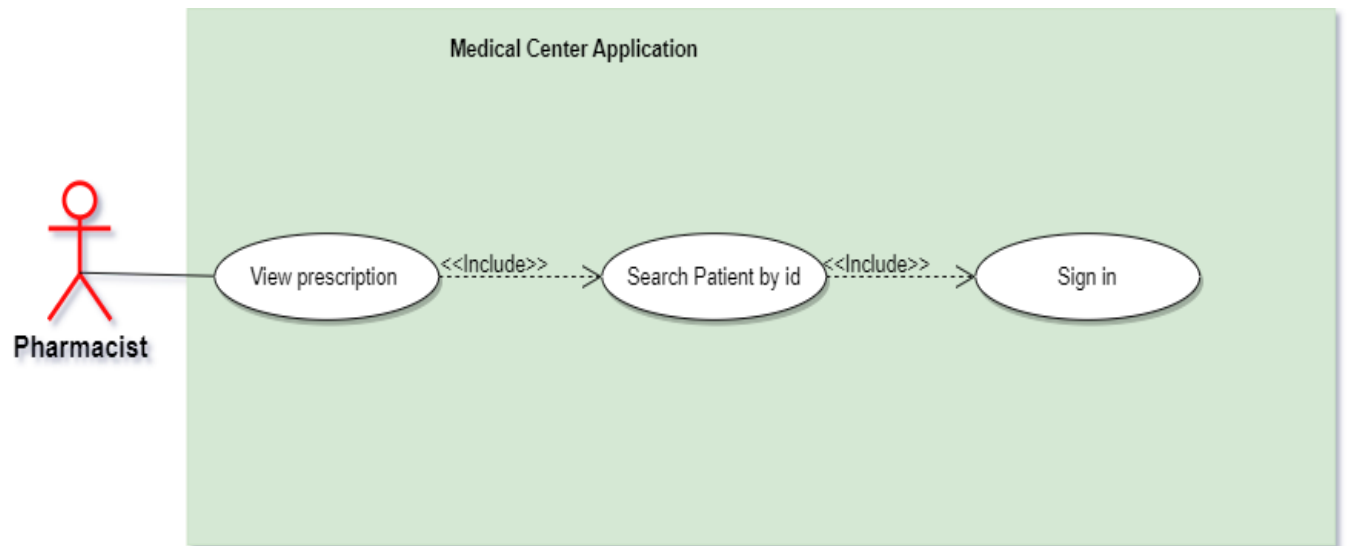


Figure 2.4 Pharmacist

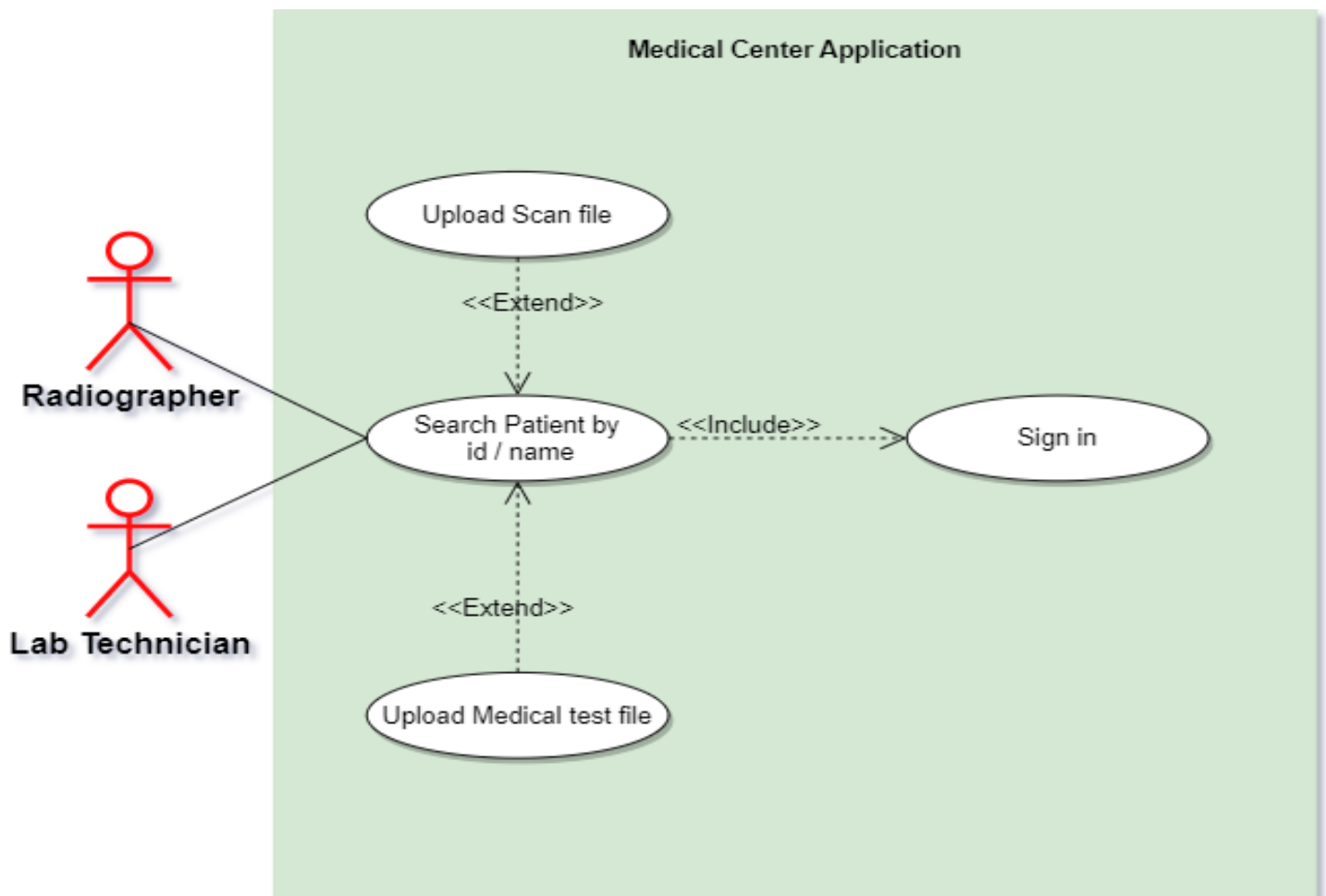


Figure 2.5 Radiologist , Lab Technician

2.3. Classes

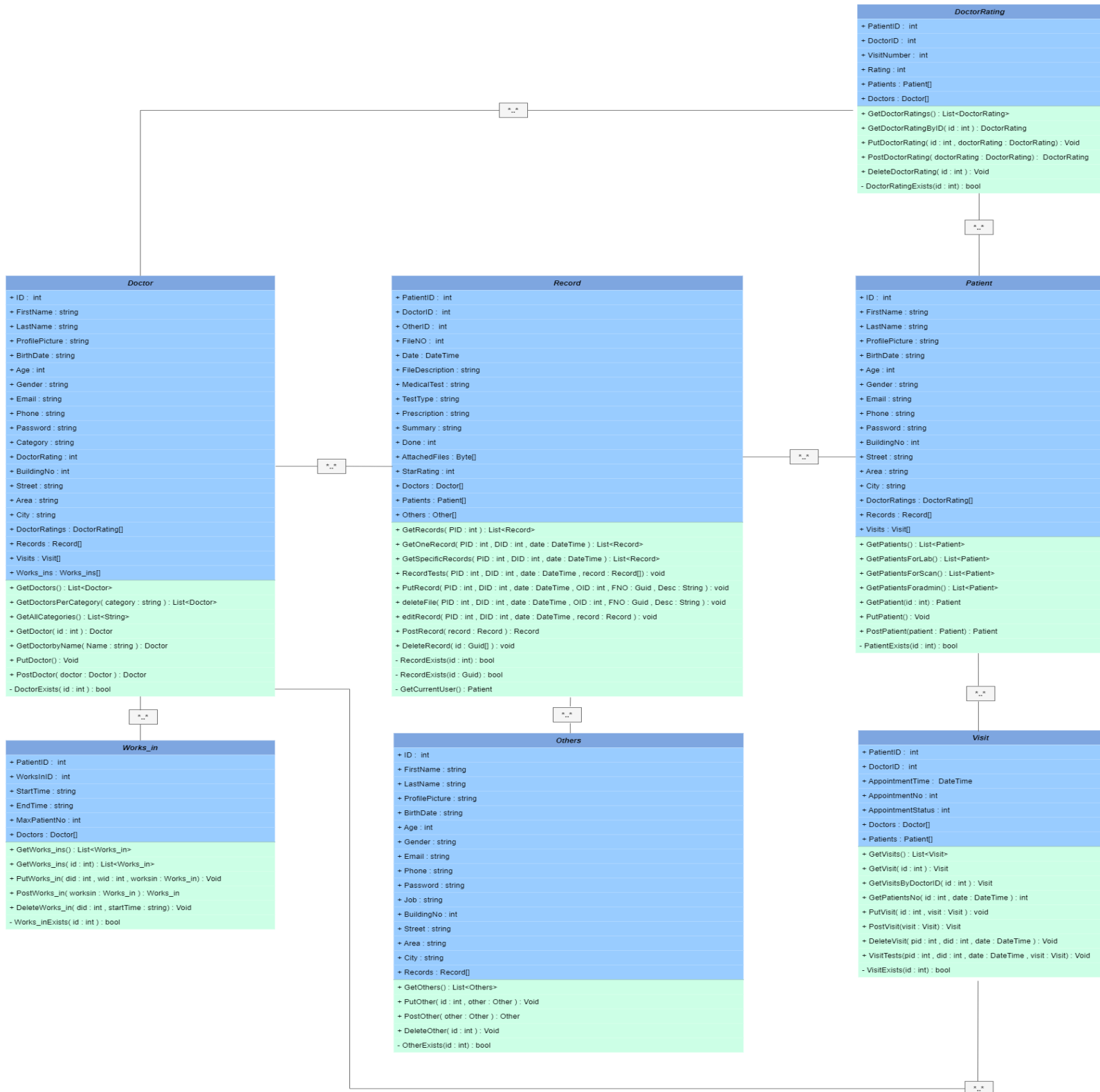


Figure 2.6 Class Diagram

2.4. Non-Functional Requirements

- o Security and validation.
- o End-user has to be authorized to do any functionality in application.
- o Medical Center web app can be used by all users from all segments. It supports English version.
- o Navigation through navbar to be redirected easily.
- o Medical Center is a free web application which can be downloaded and installed easily.
- o Medical Center is developed by using latest technologies in web.

3. Design Overview

3.1. System Architecture

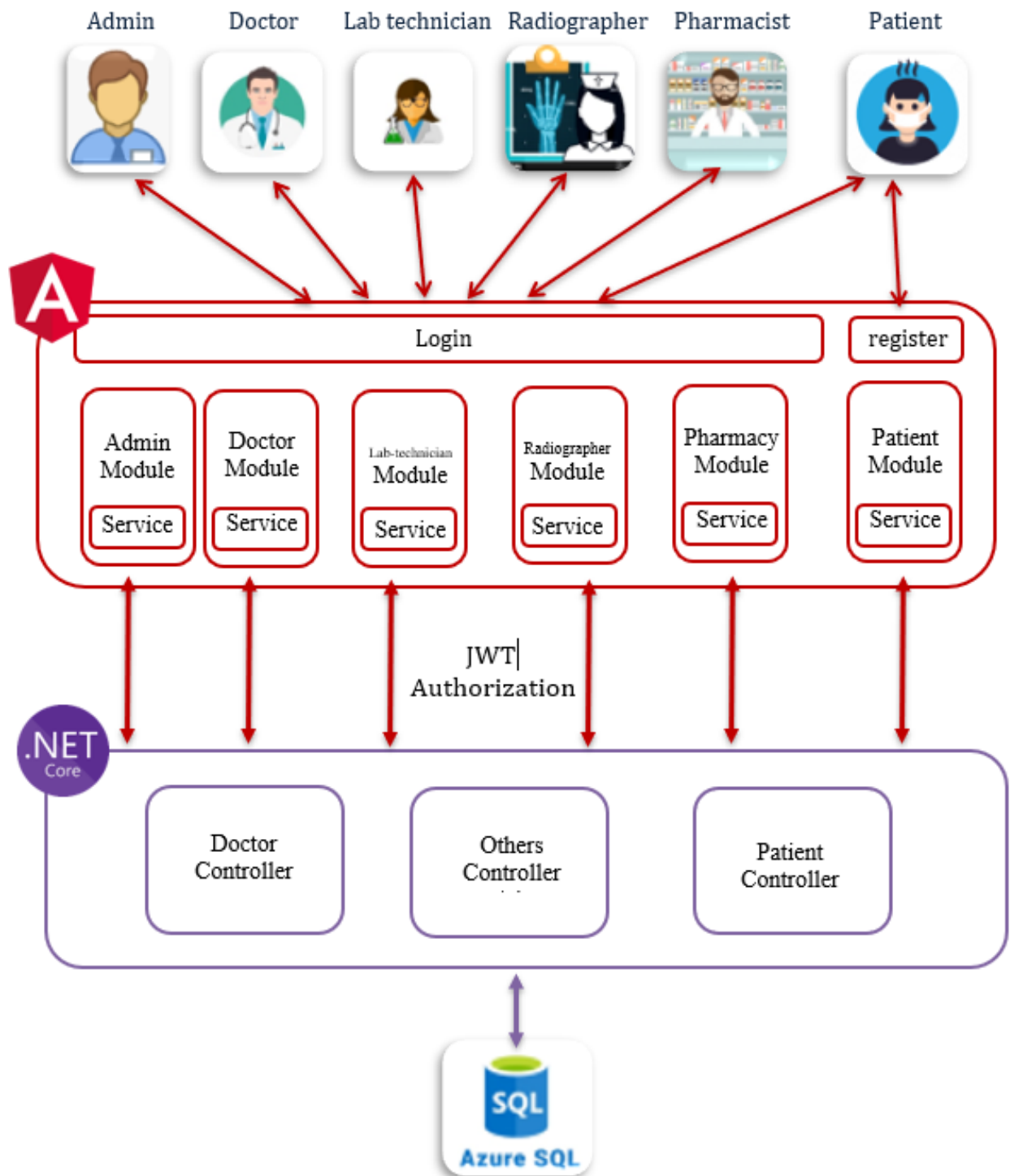


Figure 3.1 Software Architecture

3.2. Data Design (Entity Relationship Diagram)



Figure 3.2 Entity Relationship Diagram

4.Implementation

4.1. Tools and Technologies

- o **Tools:**

- Visual studio 2022
- Visual studio code
- SQL Server Management Studio 18

- o **Technologies:**

- **Database:** MS Azure SQL Server
- **Backend:** ASP.NET Core 6.0 Web API
- **ORM:** Entity Framework 6
- **Security:** JWT
- **Frontend:** Angular 13
- **Styling:** Bootstrap, CSS ,PrimeNg

- o **Source Control:**

- GitHub

4.2. Hardware Requirements

- o **Internet Connection**

5.Future Work

- o Release mobile application.
- o Allow patients to chat with their doctors to answer their concerns.
- o Choose payment method either by cash on arrival or by visa and paying through the website.
- o Adding a customer service management system to receive users' complaints.
- o Sending patients messages to notify them with updates about their appointments.
- o Sending patients ads about our latest offers.

6. User Guide

6.1. Doctor Cycle

The screenshot shows the login interface for a doctor. At the top, there is a navigation bar with the 'Medical Center' logo, 'Home', 'Login', and 'Register' links. The main area has a light green background with a blurred image of a doctor in a white coat. A white login box is centered, containing the text 'LOGIN NOW' in green. Below this are input fields for 'Email' (with 'gehanfadel1@gmail.com' entered) and 'Password' (with three dots indicating a masked password). A dropdown menu labeled 'Who Are You ?' is set to 'Doctor'. A green 'Login' button is at the bottom of the box. A Windows watermark is visible in the bottom right corner.

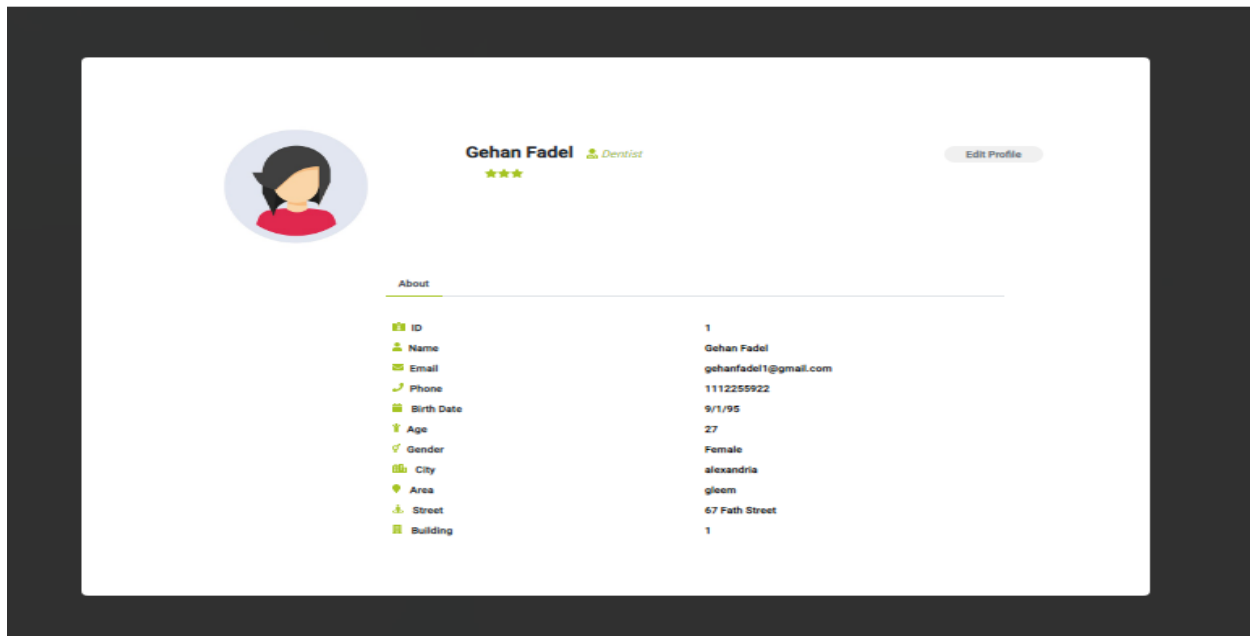
Figure 6.1.1 Doctor signs in

The screenshot shows the doctor's home dashboard. The top navigation bar includes the 'Medical Center' logo, 'Home', 'Profile', and 'Patients' links, along with a user profile for 'Gehan Fadel'. The dashboard features a welcome message: 'Welcome Dr , Gehan Fadel' with a motivational quote. A 'Total Appointment' card shows a count of 3. Below this is an 'Appointments' section with a search bar and a table of appointments.

Name	Date	NO	Status	Prescription	Profile
Hager Montaser	2022-07-17	1	✓		
Doha Mohamed	2022-07-18	1	✓		
marina magdy	2022-07-17	2	✓		

A Windows watermark is visible in the bottom right corner.

Figure 6.1.2 Doctor's home

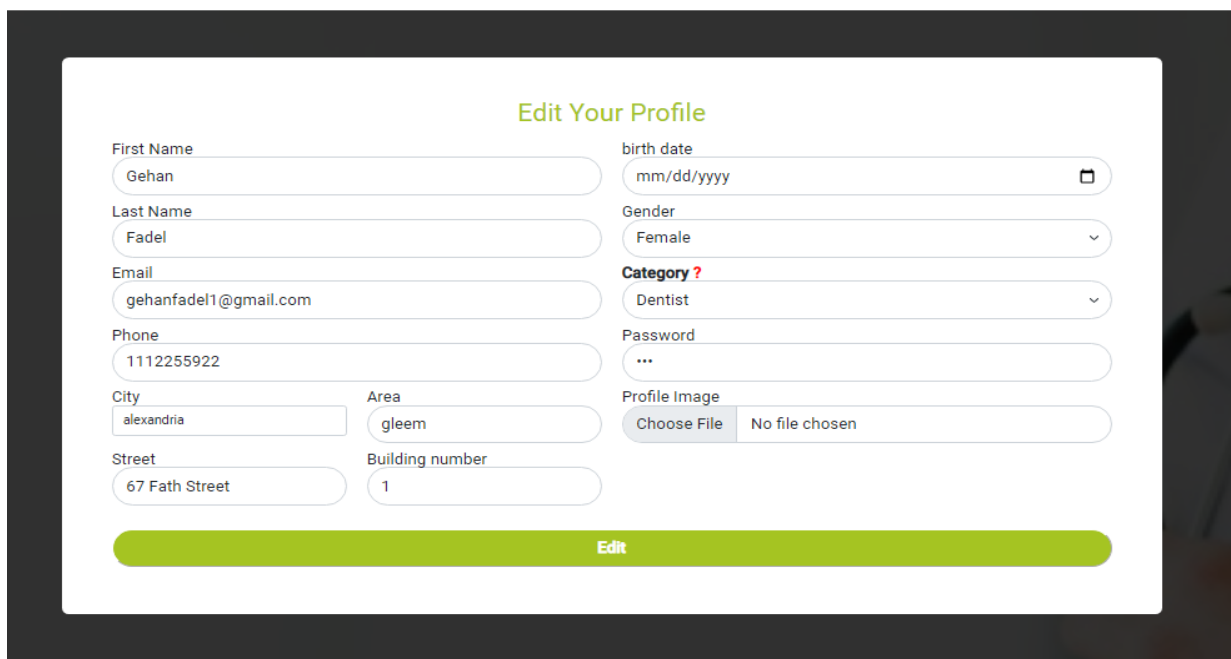


Gehan Fadel Dentist ☆☆☆ [Edit Profile](#)

About

ID	1
Name	Gehan Fadel
Email	gehanfadel1@gmail.com
Phone	1112255922
Birth Date	9/1/95
Age	27
Gender	Female
City	alexandria
Area	gleem
Street	67 Fath Street
Building	1

Figure 6.1.3 Doctor's profile



Edit Your Profile

First Name

Last Name

Email

Phone

City

Area

Street

Building number

birth date

Gender

Category ?

Password

Profile Image

[Edit](#)

Figure 6.1.4 Doctor edits profile

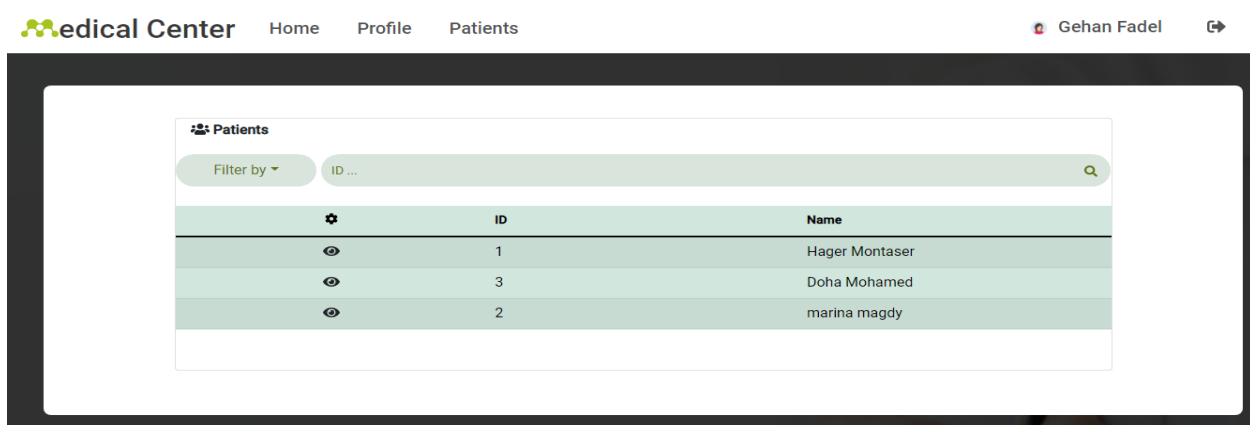


Figure 6.1.5 Doctor's patients

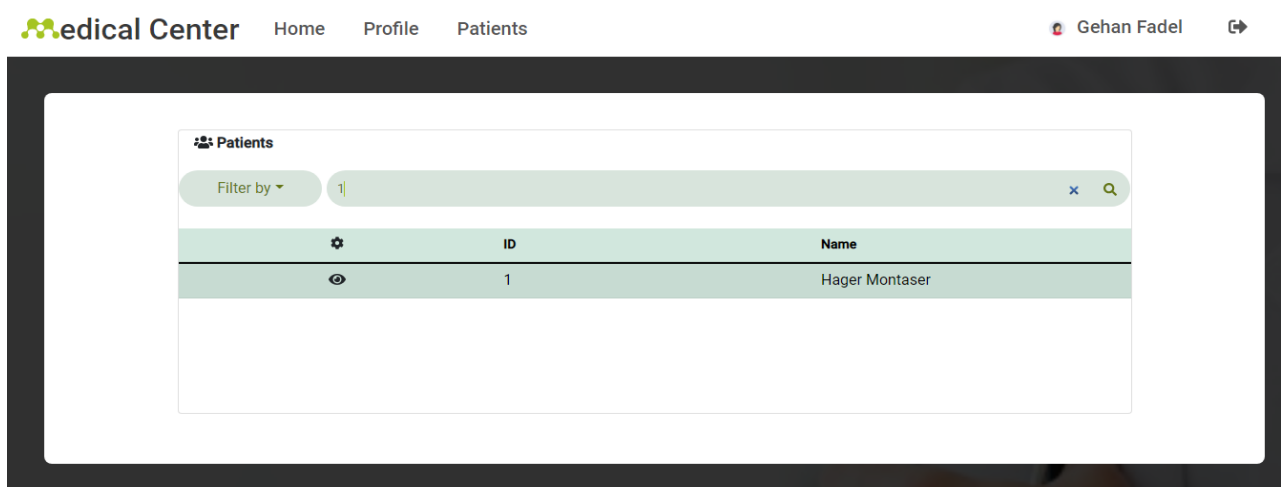


Figure 6.1.6 Doctor searches for patients by ID

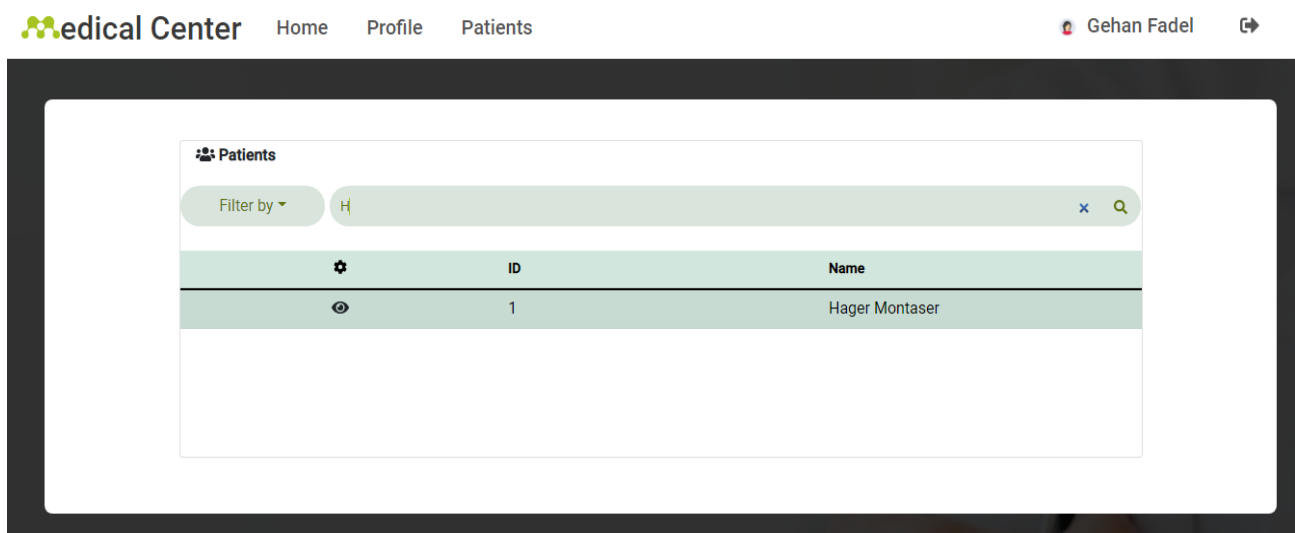


Figure 6.1.7 Doctor searches for patients by name

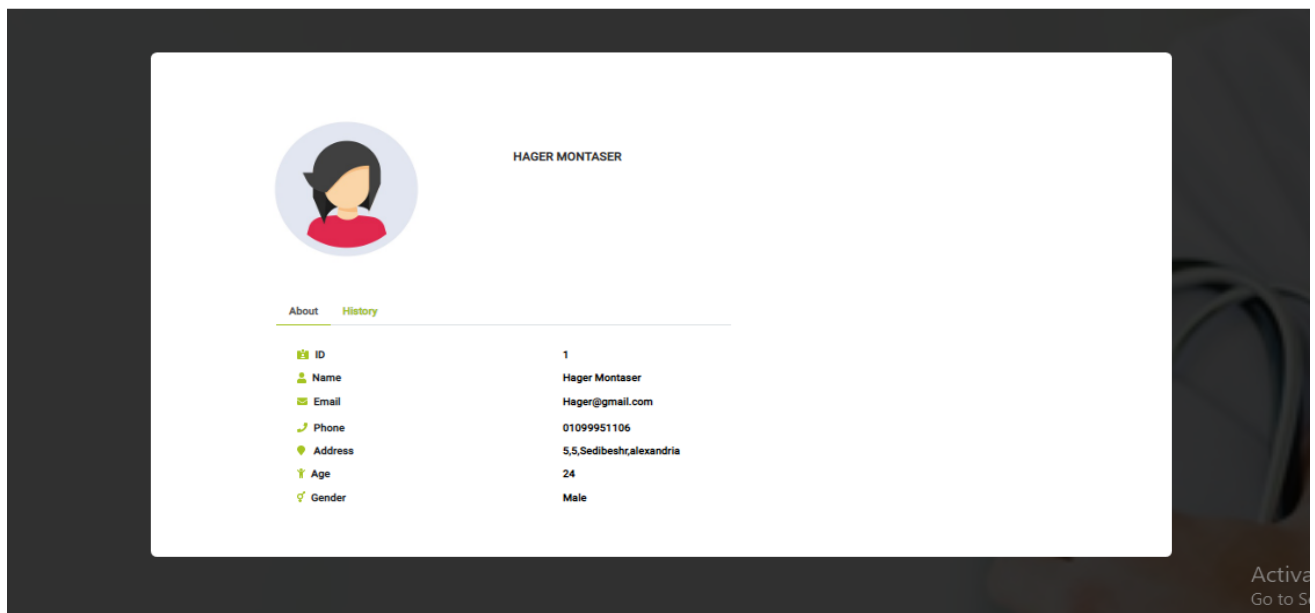


Figure 6.1.8 Doctor views patients' profiles

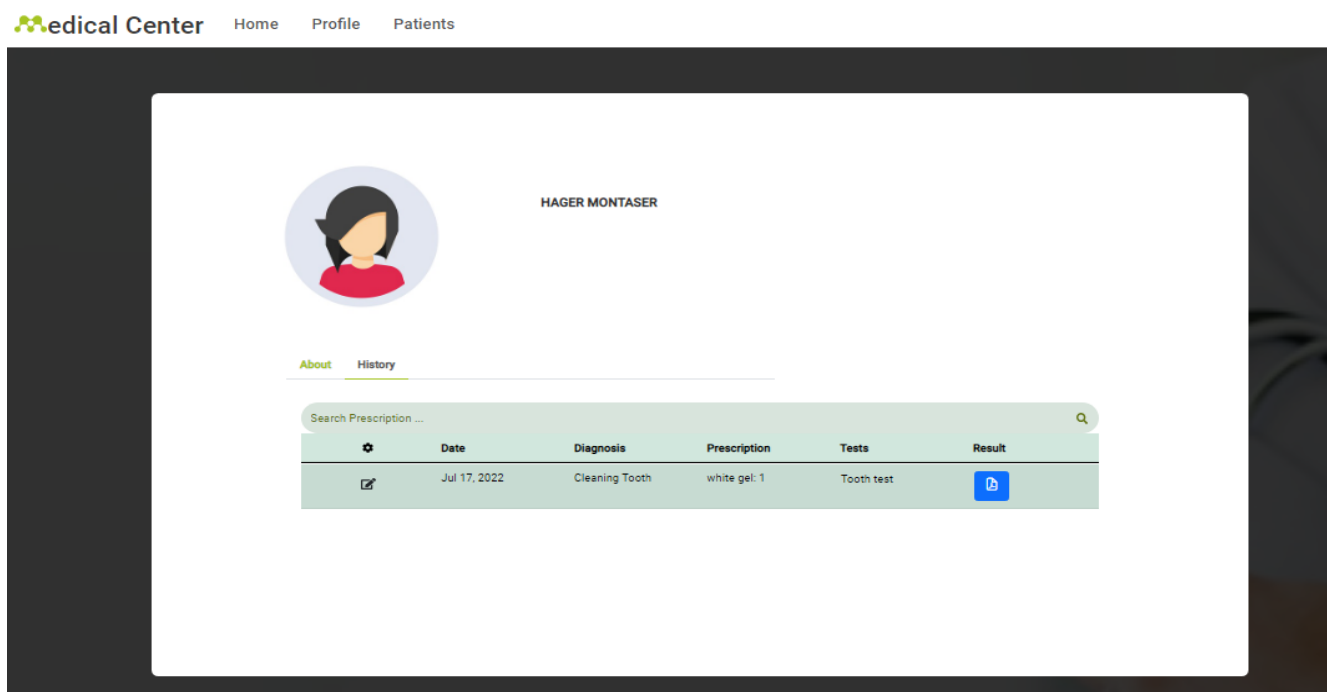


Figure 6.1.9 Doctor views patients' prescriptions and medical history

Back

Record

Date+
07/17/2022 09:00 AM

Medical Diagnosis+
Cleaning Tooth

	Medicine	Extra info
	white gel	1
+	<input type="text"/>	<input type="text"/>

	Medical Tests	Type
	Tooth test	Test
+	<input type="text"/>	<input type="text"/>

Edit

Figure 6.1.10 Doctor records or edits prescriptions for patients

6.2. Patient Cycle

Medical Center Home Login Register

LOGIN NOW

Email
Hager@gmail.com

Password
...

Who Are You ?
v

Login

Don't have an account ?
Register As Patient

Figure 6.2.1 Patient signs in

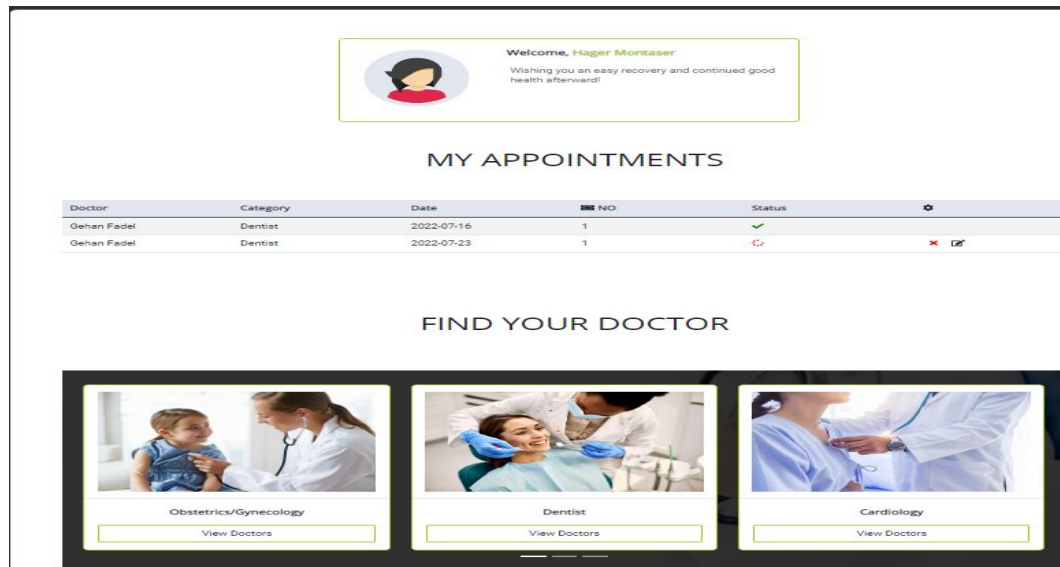


Figure 6.2.2 Patient's Home Page

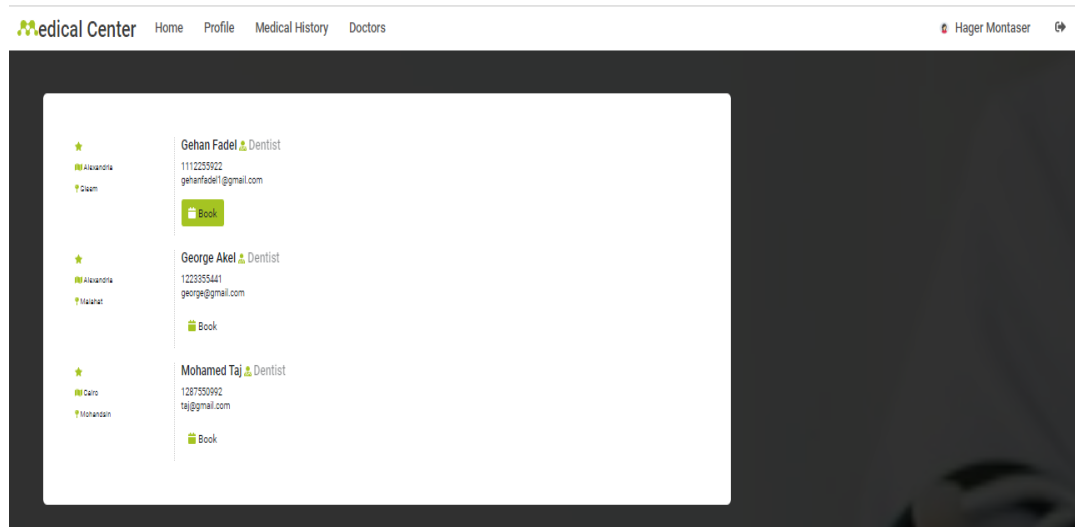


Figure 6.2.3 View doctors using the bottom slider

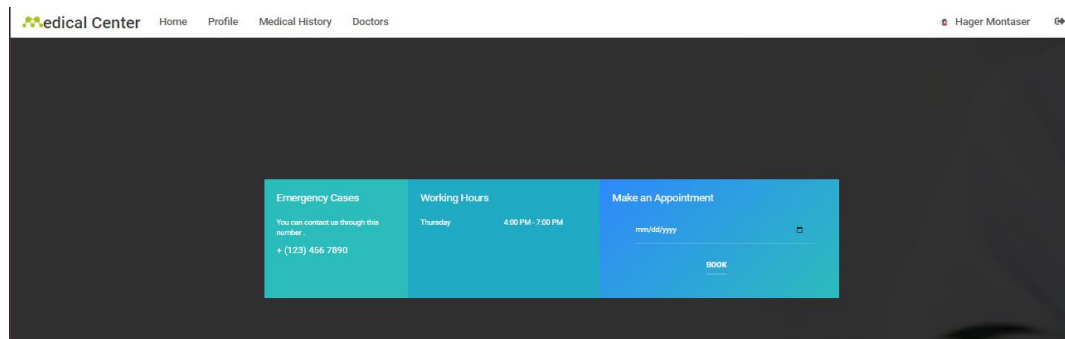


Figure 6.2.4 Appointment booking Page

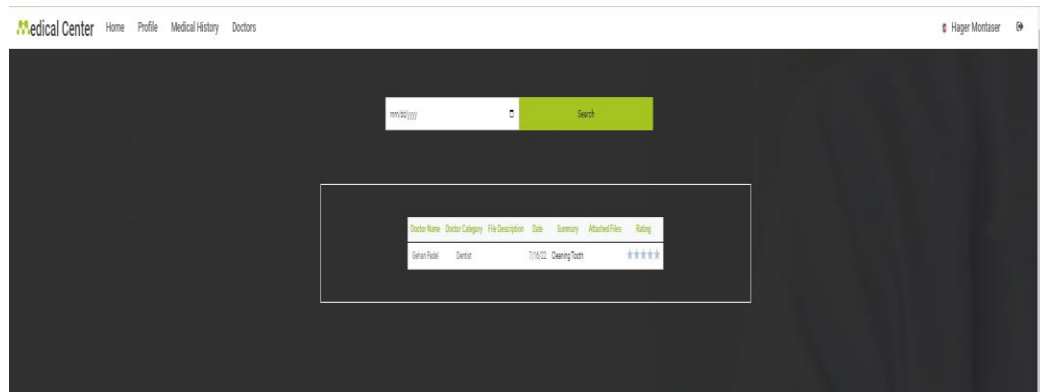


Figure 6.2.5 Show the patient's medical history and rating



Figure 6.2.6 Searching for doctors' page

6.3. Laboratory Technician and Radiologist Cycle

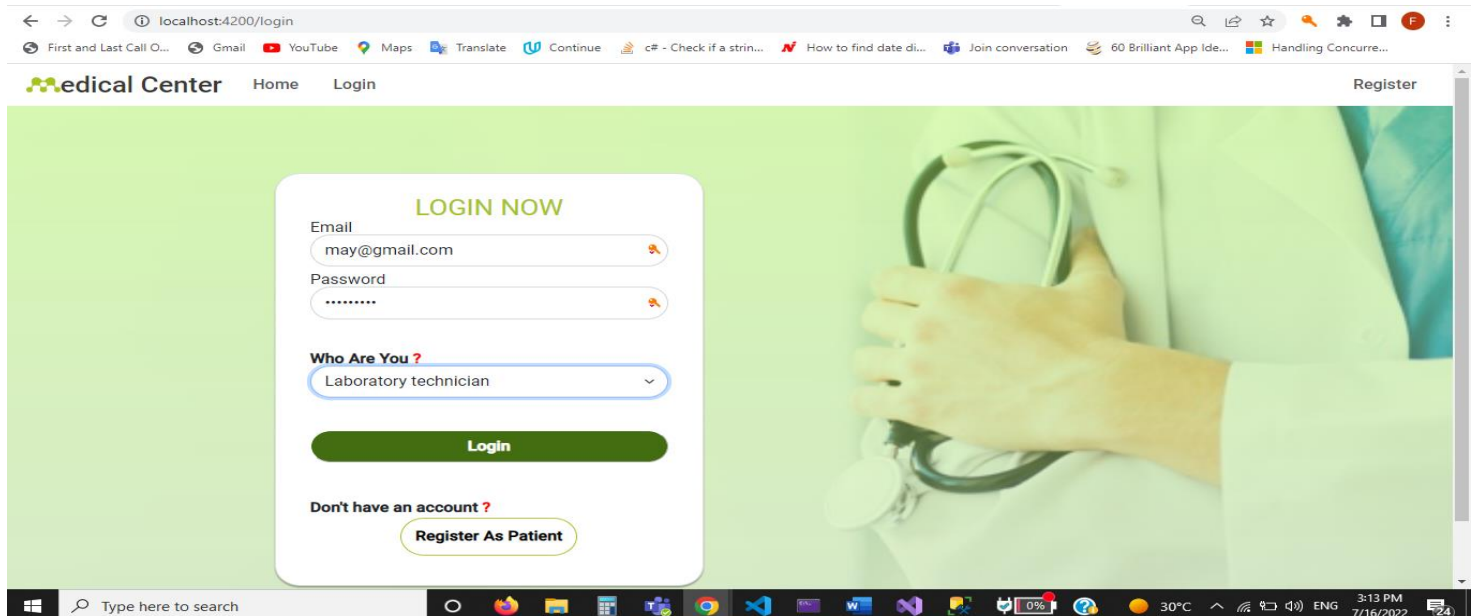


Figure 6.3.1 Lab technician/Radiographer signs in

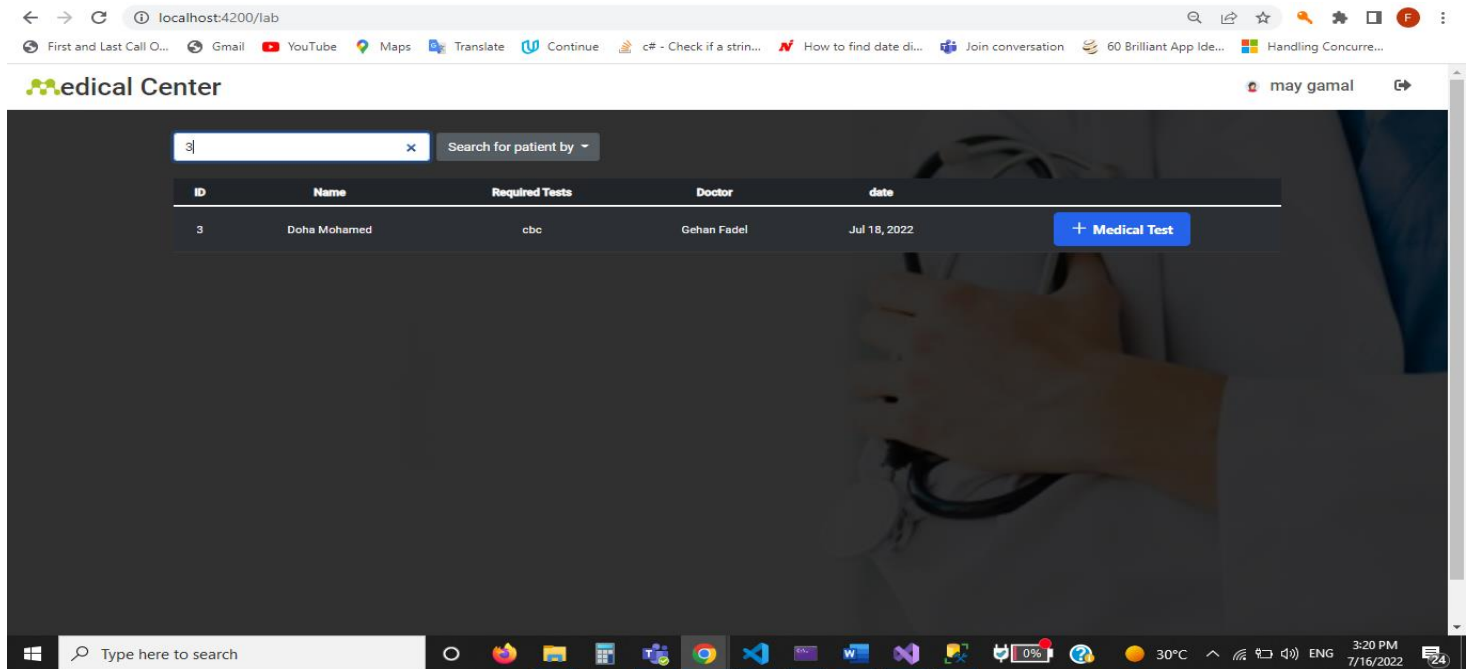


Figure 6.3.2 Lab technician or Radiographer could search on a patient either by id or by name

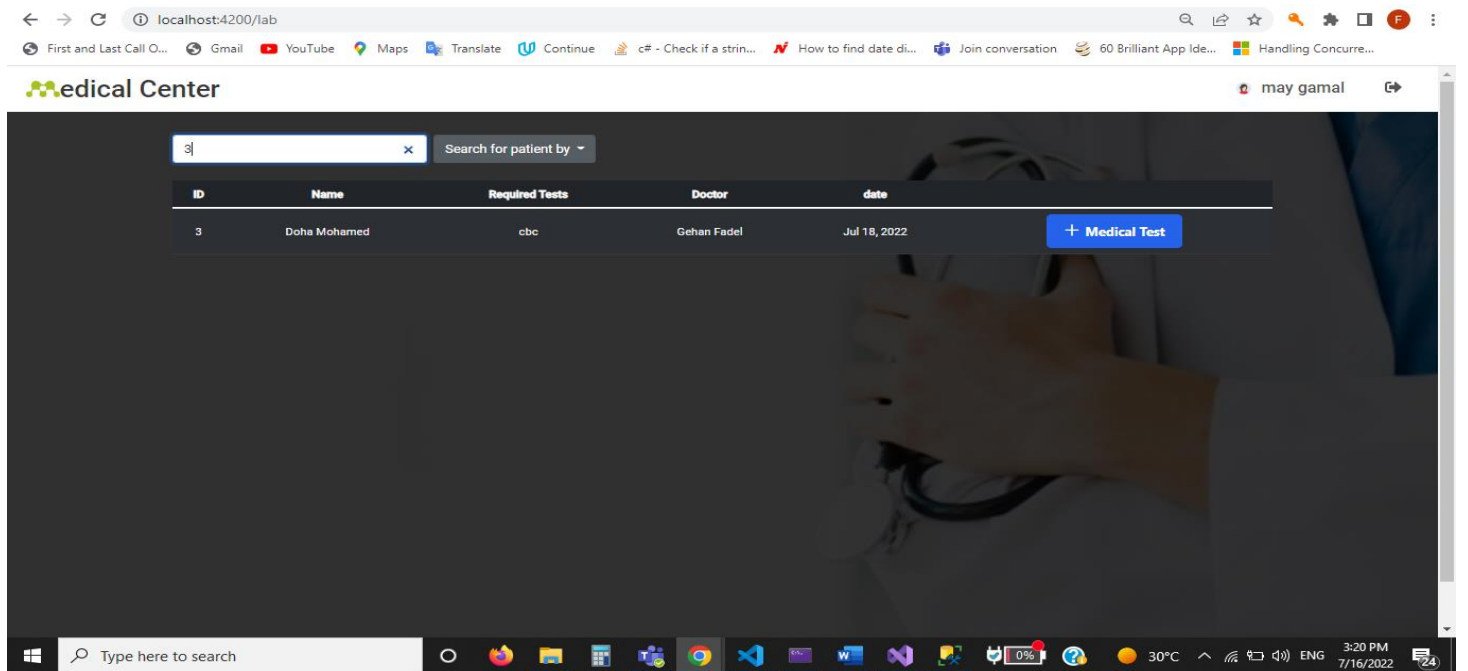


Figure 6.3.3 Lab Technician/Radiographer could upload patient's Medical Test/ Scan

6.4. Pharmacist Cycle

The screenshot shows the login interface for a Pharmacist at the Medical Center. The page has a light green background with a blurred image of a pharmacist in a white coat. The login form is centered and includes the following elements:

- Medical Center logo and navigation links (Home, Login, Register) at the top.
- A "LOGIN NOW" button.
- Email input field with the value "malk@gmail.com".
- Password input field with masked characters "*****".
- A dropdown menu labeled "Who Are You?" with "Pharmacist" selected.
- A green "Login" button.
- A link "Don't have an account?" with a "Register As Patient" button below it.

Figure 6.4.1 Pharmacist signs in

The screenshot displays the patient prescription view. It features a search bar and a list of patient details. Below the details, there is a table showing the prescribed medicine and its information.

Medicine	Info
white gel	1

Figure 6.4.2 Pharmacist views patient's prescription

6.5. Admin Cycle

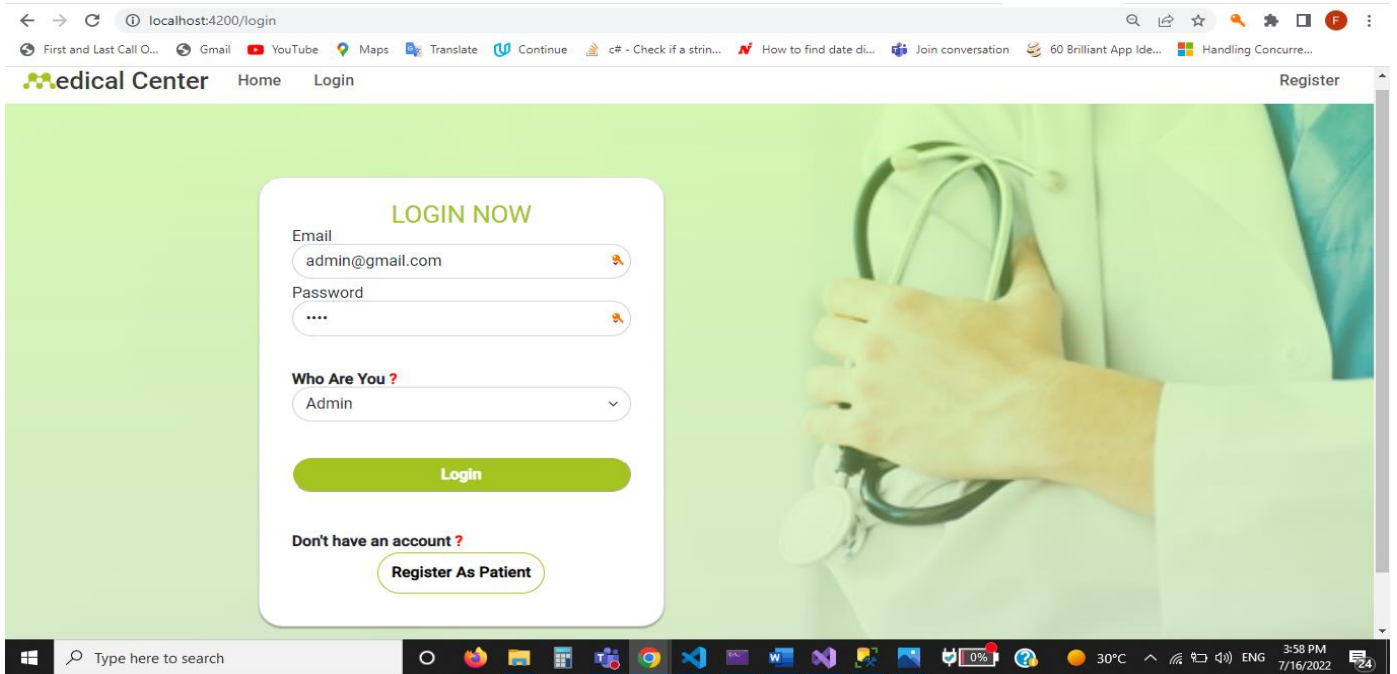


Figure 6.5.1 Admin signs in

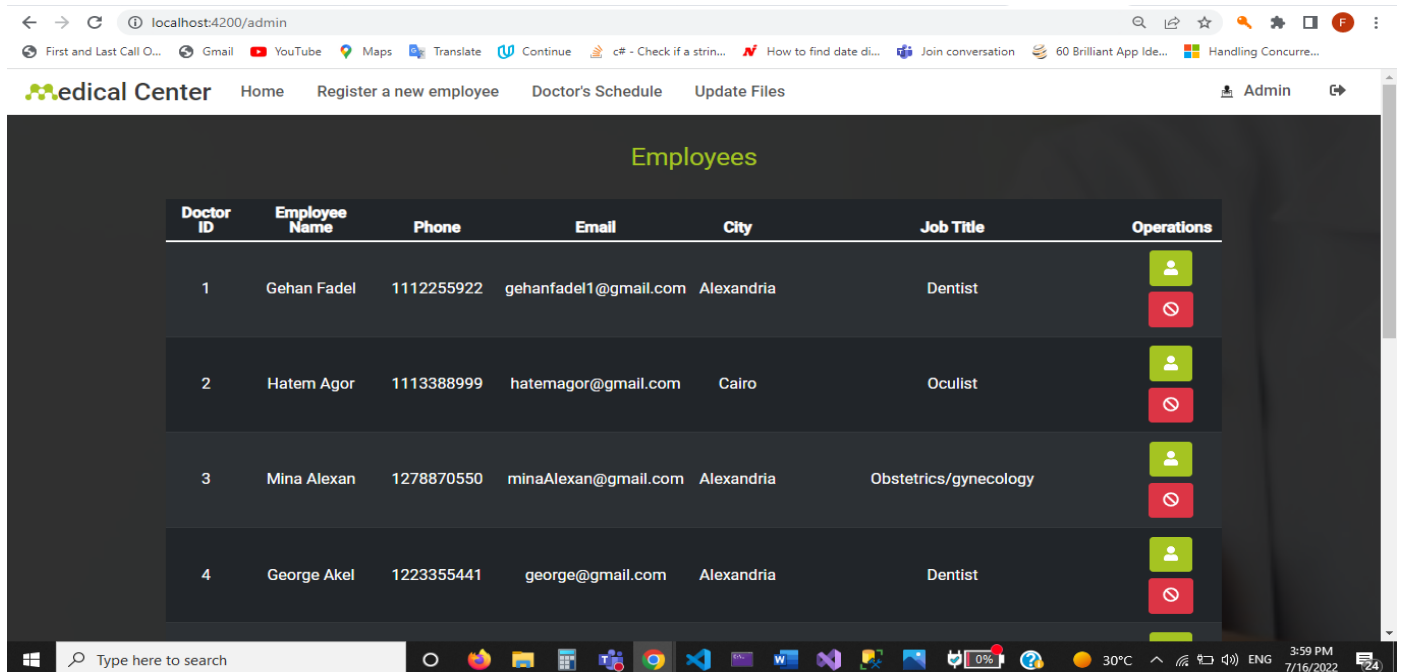


Figure 6.5.2 Admin Home Page where he could delete an employee/Doctor or shows employee's/Doctor's personal data

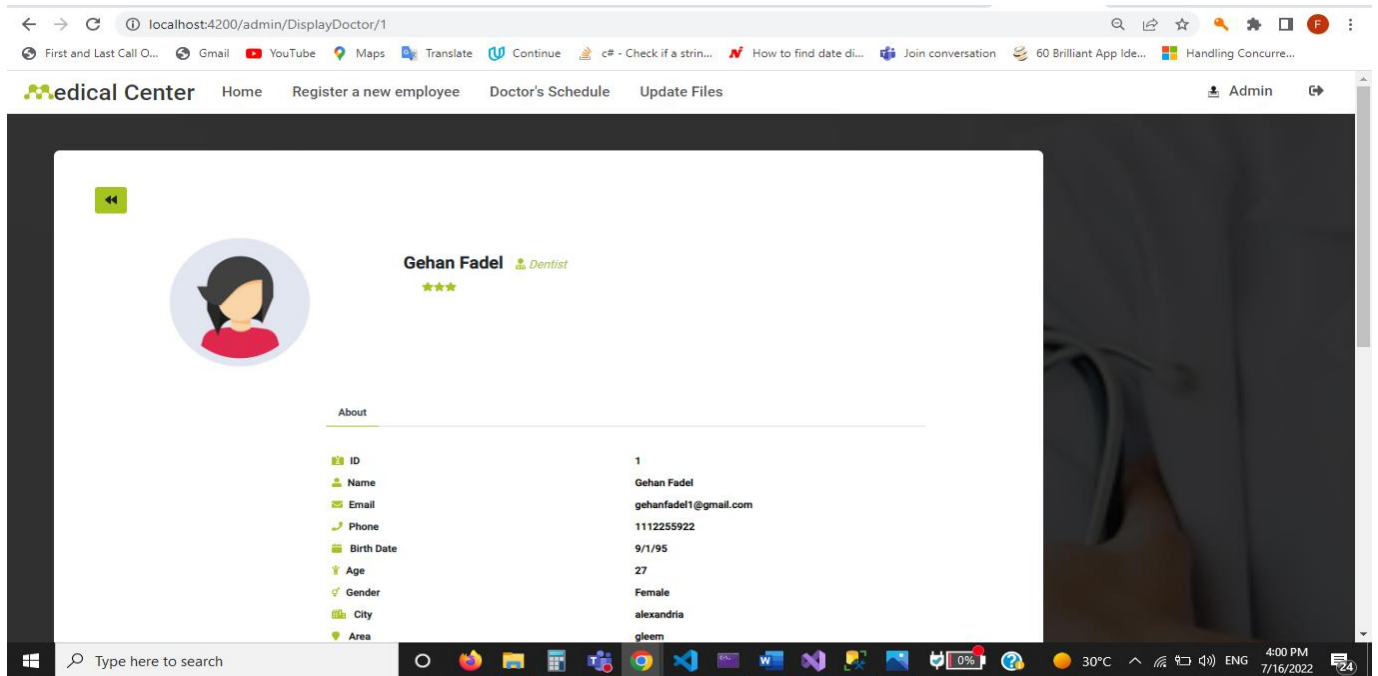


Figure 6.5.3 In case admin shows an employee's/Doctor's profile

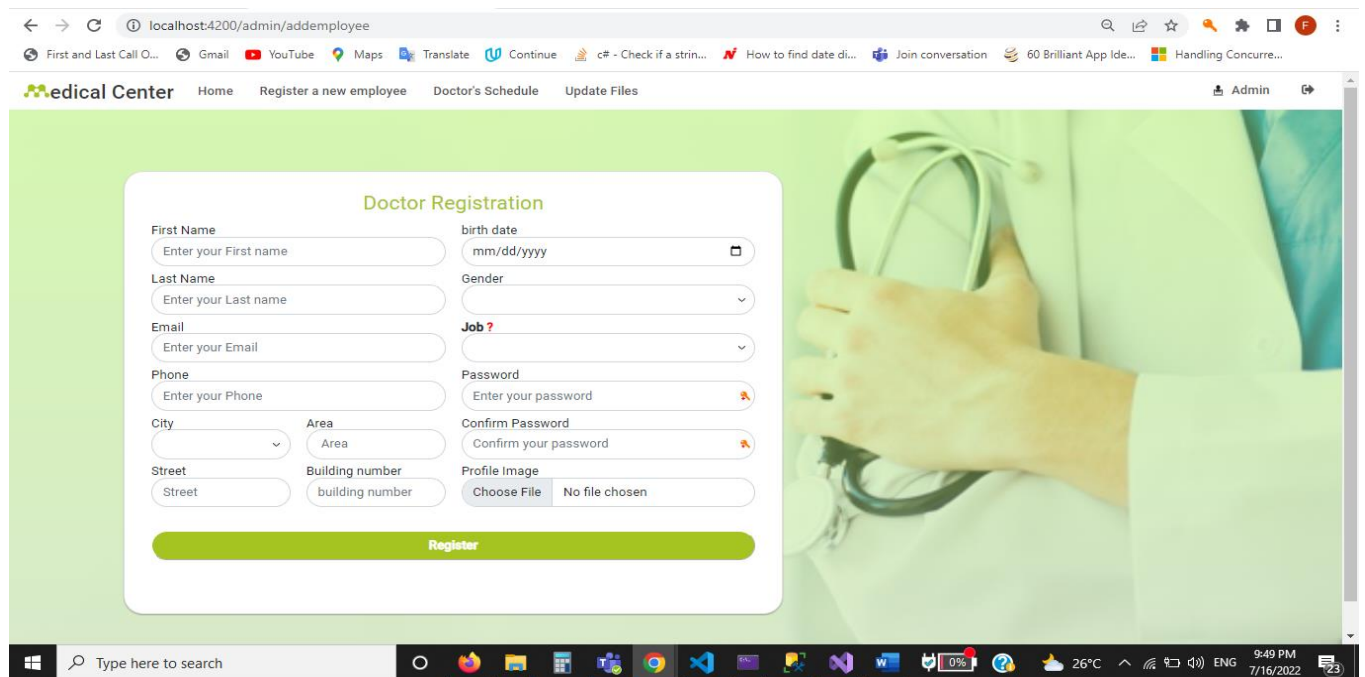


Figure 6.5.4 Admin could add a new employee/Doctor

localhost:4200/admin/addemployee

Medical Center Home Register a new employee Doctor's Schedule Update Files Admin

Doctor Registration

First Name birth date

First name is required Age must be older than 25 years

Last Name Gender

Last name is required Gender is required

Email Job

email is required Job is required

Phone Password

phone is required Password is required

City Area

city is required Confirm Password

Confirm your password

Street Building number

Street building number Password is required

Choose File No file chosen Two passwords are not similar

There is no attached file.

Register

Figure 6.5.5 Form validations on adding a new employee/Doctor

Doctor ID

Doctor name

⚙	Start time	End time	Max # of patients	⚙
🗑	Wednesday 3:00 PM	Wednesday 6:00 PM	20	✎
🗑	Saturday 3:00 PM	Saturday 6:00 PM	10	✎
🗑	Saturday 2:00 PM	Saturday 7:00 PM	15	✎
🗑	Friday 6:00 PM	Friday 9:00 PM	20	✎
🗑	Tuesday 2:00 PM	Tuesday 9:00 PM	10	✎

Figure 6.5.6 Search to get doctor's schedule to add, edit or delete timetable

Back

Choose Day*

Start At*

End At*

Maximum # of patients*

Enter max number of patients

Add

Figure 6.5.7 Add new timetable to doctor's schedule.

medical Center Home Register a new employee Doctor's Schedule Update Files Admin

Choose Day*

Friday

Start At*

6:00

PM

End At*

9:00

PM

Maximum # of patients*

20

Edit

Figure 6.5.8 Edit an old timetable from doctor's schedule.

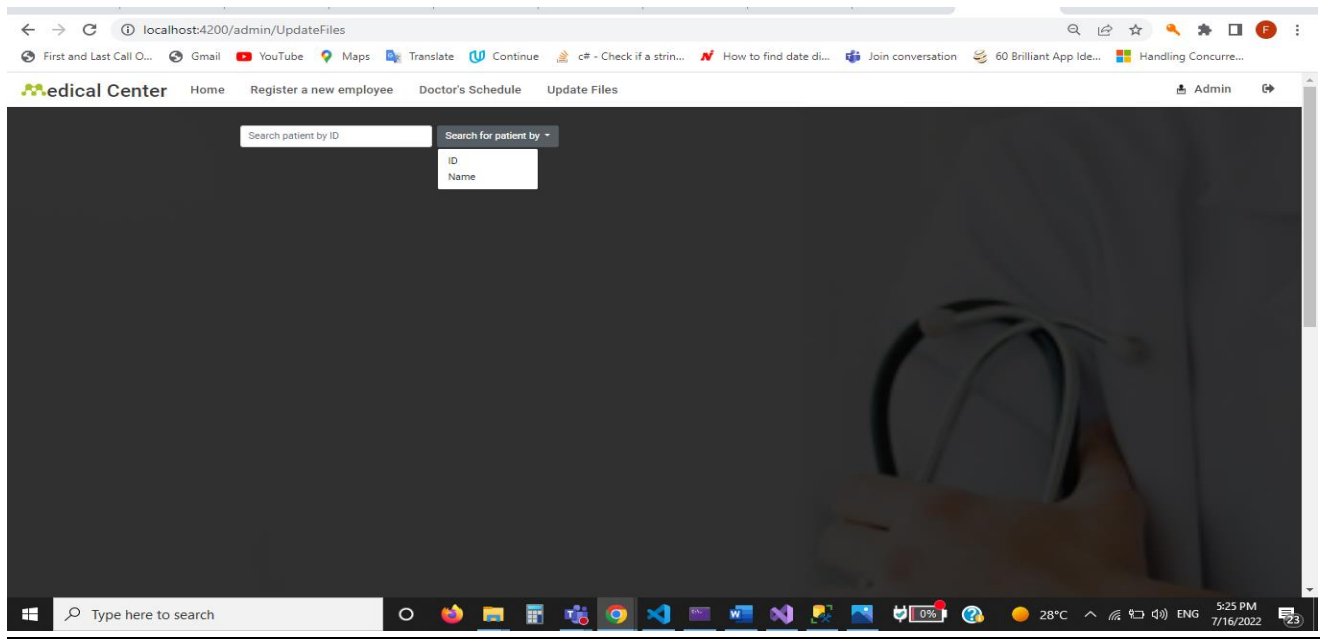


Figure 6.5.9 Admin could search for patient name or by id in order to update or delete one of his uploaded files

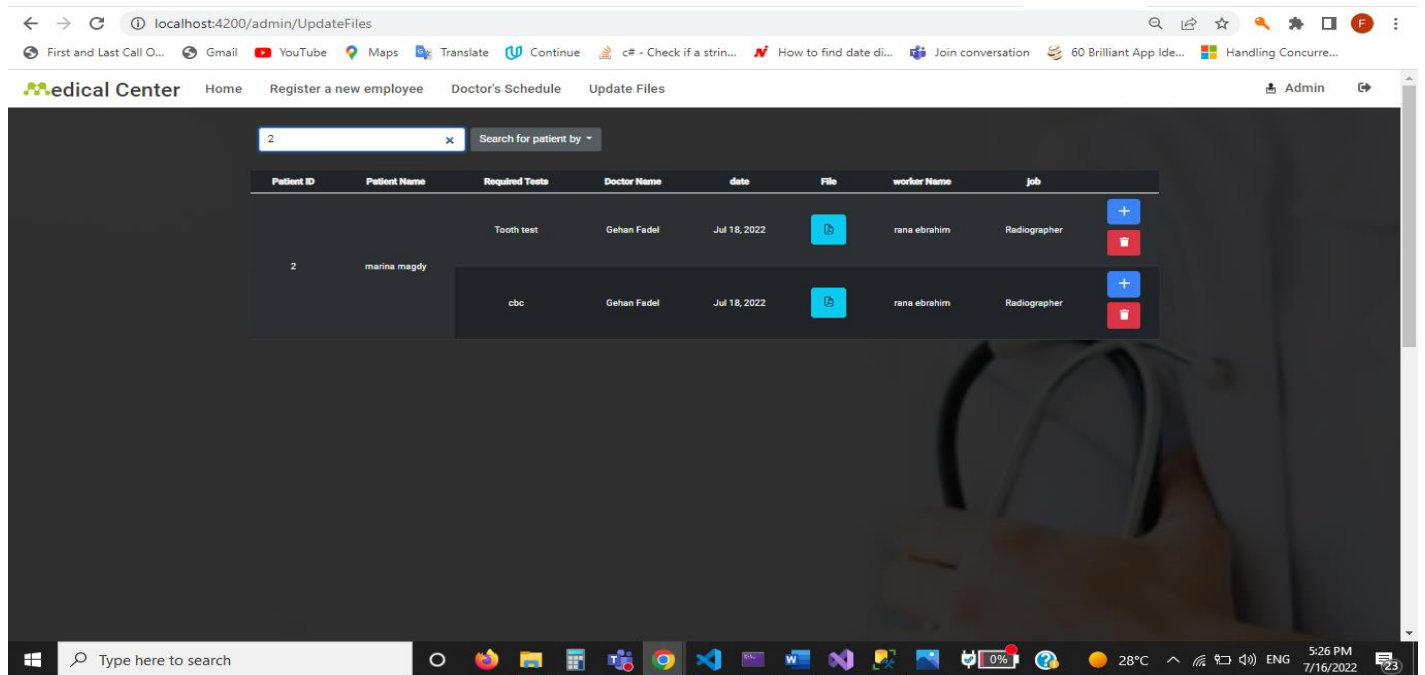


Figure 6.5.10 Admin could show, update, or delete uploaded file

