

Project Report

On

“Medi-Track”

SUBMITTED TO

ROURKELA INSTITUTE OF MANAGEMENT STUDIES

(As a Partial fulfilment of the requirement for the award of degree)

FOR

“MASTER IN COMPUTER APPLICATION “

(2023-25)

SUBMITTED BY

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CERTIFICATE OF EXAMINATION

This is to certify that this project report entitled "**Medi-Track**" submitted by **ABHIJIT BADAPANDA** of 4th Semester, **Rourkela Institute of Management Studies, Rourkela**, is accepted as partial fulfillment of requirements for the degree in **Master in Computer Applications**, under **Biju Pattnaik University of Technology, Rourkela**, this has been verified by us and found be original up to our satisfaction.

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CERTIFICATE

This is to certify that this project entitled “**Medi-Track**” has been and submitted by **ABHIJIT BADAPANDA**, M.C.A 2023-2025, **Rourkela Institute of Management Studies, Rourkela**, has been examined by us. He is found fit and approved for the award of “**Master in Computer Application**” Degree. To the best my knowledge this work has not been submitted for the award of any other degree.

I wish all success in his life.

DEAN ACADEMIC RIMS, ROURKELA

Prof. Bibhudendu Panda
Head of The Department, MCA
Rourkela Institute of Management Studies, Rourkela

CERTIFICATE

This is to certify that **ABHIJIT BADAPANDA** student of **M.C.A, Rourkela Institute of Management Studies, Rourkela, Odisha** of Session 2023-2025 has completed the project successfully.

I wish all success in his life.

(Prof. Bibhudendu Panda)

DECLARATION

I, ABHIJIT BADAPANDA, hereby declare that the project report Entitled “**Medi-Track**” is of my work. The above work I submitted to “**Biju Patnaik University of Technology, Rourkela**” for the award of “**Master in Computer Applications**” Degree.

To the best of my knowledge, this work has not been submitted or published anywhere for the award of any degree.

ABHIJIT BADAPANDA

ACKNOWLEDGEMENT

I am deeply indebted to **Rourkela Institute of Management Studies, Chhend, Rourkela**, for providing me an opportunity to undertake a project work entitled “**Medi-Track**”.

I am grateful to my project guide **Prof. Bibhudendu Panda** without his guidance it would not have been possible on my part to complete the project.

I acknowledge the help and co-operation received from all my team members in making this project.

I consider myself fortunate that I have successfully completed this project; I acknowledge my sincere gratitude to all those works and ideas that had helped me in writing this project.

ABHIJIT BADAPANDA

University Roll No: 2305260001

MCA (2023-2025)

**Rourkela Institute of Management Studies,
Rourkela.**

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Internship Certificate

This is to certify that Mr/miss. Mrs Abhijit Badapanda No. d/o Pradeep Badapanda Has successfully completed the Internship on Spring Boot In our company From January 2025 to on March 2025.

JT/SB/2022

CERTIFICATE NUMBER

22-03-2025

DATE OF ISSUE

Samrukh
TRAINER SIGNATURE

W. W. Das
DIRECTOR SIGNATURE

*Providing training and service related to
Software and IT Sector*

This certificate remains the property of student to whom we are providing internship in our company. This certificate doesn't provide the immunity from its legal obligation. To know about us visit us at www.juveniliatechnology.com.

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Abstract

The Medi-Track project is a digital healthcare platform designed to enhance the efficiency and accessibility of medical services by providing an intuitive doctor appointment booking system, specialization-based matching support. The system integrates key functionalities such as electronic medical records (EMR) management, automated scheduling and real-time notifications to improve patient-doctor interactions. Advanced security measures ensure compliance with healthcare regulations like HIPAA and GDPR, safeguarding sensitive medical data. By incorporating the system enables remote consultations, reducing wait times and improving healthcare access, especially in remote areas. The Medi-Track project aims to modernize healthcare delivery through seamless digital solutions, making medical services more efficient, secure, and patient-centric.

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CHAPTER ONE

INTRODUCTION

Background

Introducing Medi-Track projects, accessibility and efficiency in the rapidly growing world of medicine are essential to the provision of high-quality medical services. Project Medi-Track is an innovative platform that streamlines the healthcare experience with seamless physician appointments, comprehensive physician specialist lists, and improved patient physician interactions. Our platform has a wide range of specialists, including general physicians, cardiologists, dermatologists, and neurologists. Whether it's personal visits or virtual advice, Project Medi-Track has set out to provide modern, efficient, and patient-friendly health solutions.

Purpose

The key goals of this initiative are as follows:

1. Enable patients to book appointments with doctors effortlessly, reducing wait times and improving healthcare access.
2. Provide a comprehensive list of doctors categorized by specialization (e.g., cardiologists, neurologists, dermatologists) to help patients find the right expert
3. Facilitate virtual consultations, allowing patients to connect with doctors remotely for quick and convenient medical advice.
4. Offer real-time appointment scheduling and availability tracking for both patients and doctors.
5. Enhance interaction through chat, video consultations, and digital prescriptions for better follow-ups.
6. Implement robust security measures to protect patient information and ensure compliance with healthcare regulations.

Motivation

The growing demand for reachable and green health offerings underscores the want for technical operation answers that simplify patient care. Many people with long wait instances, finding the right expert is hard, and access to medical consultations, in particular far off locations, is constrained. undertaking Medi-Tech is inspired by using its vision to close these gaps via digital transformation in healthcare. by way of using wise scheduling, telehealth, our goal is to create a continuing, clean-to-use platform that combines patients with the right physicians quickly and efficiently. We need to reinforce each patient and fitness provider carriers by decreasing control pressure, improving appointment control, and making sure safe get admission to scientific files. project Medi-Tech is not just about the convenience of making a fitness environment this is reachable, reliable and available to everybody in the future.

CHAPTER TWO

LITERATURE REVIEW

Challenges

Developing a Medi-track assignment that consists of physician appointments and specialization control comes with several demanding situations. one of the number one hurdles is ensuring seamless integration between numerous healthcare carriers, digital clinical records (EMR) structures, and affected person databases even as keeping compliance with guidelines like HIPAA or GDPR. consumer experience is also important—both doctors and sufferers want an intuitive interface for scheduling, managing, and tracking appointments without technical problems.

moreover, enforcing a sturdy specialization-matching algorithm is critical to make certain sufferers are directed to the proper experts primarily based on their signs and symptoms or scientific history. protection and data privateness are predominant worries, as dealing with touchy health information requires robust encryption, authentication, and get admission to manipulate measures. furthermore, real-time availability updates, telemedicine assist, and coping with cancellations or rescheduling efficaciously add complexity to the development manner. Overcoming those challenges requires a combination of superior technology, regulatory know-how, and person-centric design.

CHAPTER THREE

SYSTEM REQUIREMENTS

Hardware Requirements

- Display: 1920x1080 resolution Monitor.
- Processor: Intel Core i5 or higher.
- Network: Internet connectivity or Wi-Fi.
- Storage: At least 256GB SSD.
- RAM: 8GB or higher.

Software Requirements

- Visual Studio Code.
- Git
- My SQL
- XAMPP

CHAPTER FOUR

TOOLS AND TECHNOLOGIES

Graphical User Interface will be the preferred front-end interface to information display, since easy to use even for inexperienced users, it is attractive, provide shortcuts, and allows room for multitasking.

HTML

Hyper Text Mark-up Language is used for developing front-end Graphical user interface. It is standard language used for web pages.

CSS

Cascading style sheets are a style sheet language used to show a document or content written in mark-up language.

SPRING BOOT

Spring Boot is a Java framework that makes it easier to create and run Java applications. It simplifies the configuration and setup process, allowing developers to focus more on writing code for their applications.

MYSQL

For database MYSQL is used. This technology will ensure that the software is scalable, reliable, and secure.

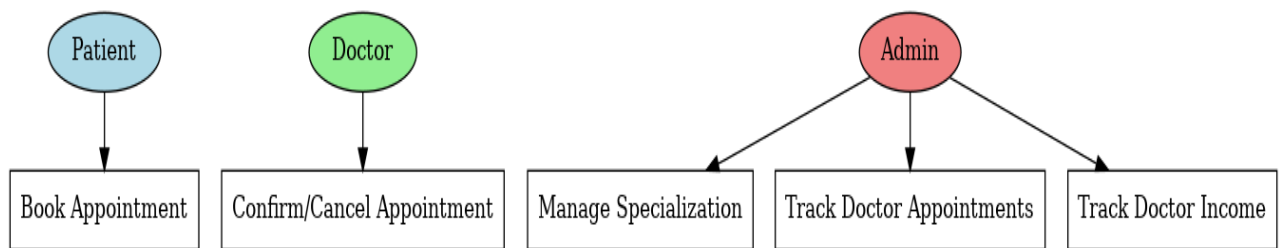
JAVA

Java is a class-based, object-oriented programming language that is designed to have as few implementation dependencies as possible. It is intended to let application developers Write Once and Run Anywhere (WORA), meaning that compiled Java code can run on all platforms that support Java without the need for recompilation.

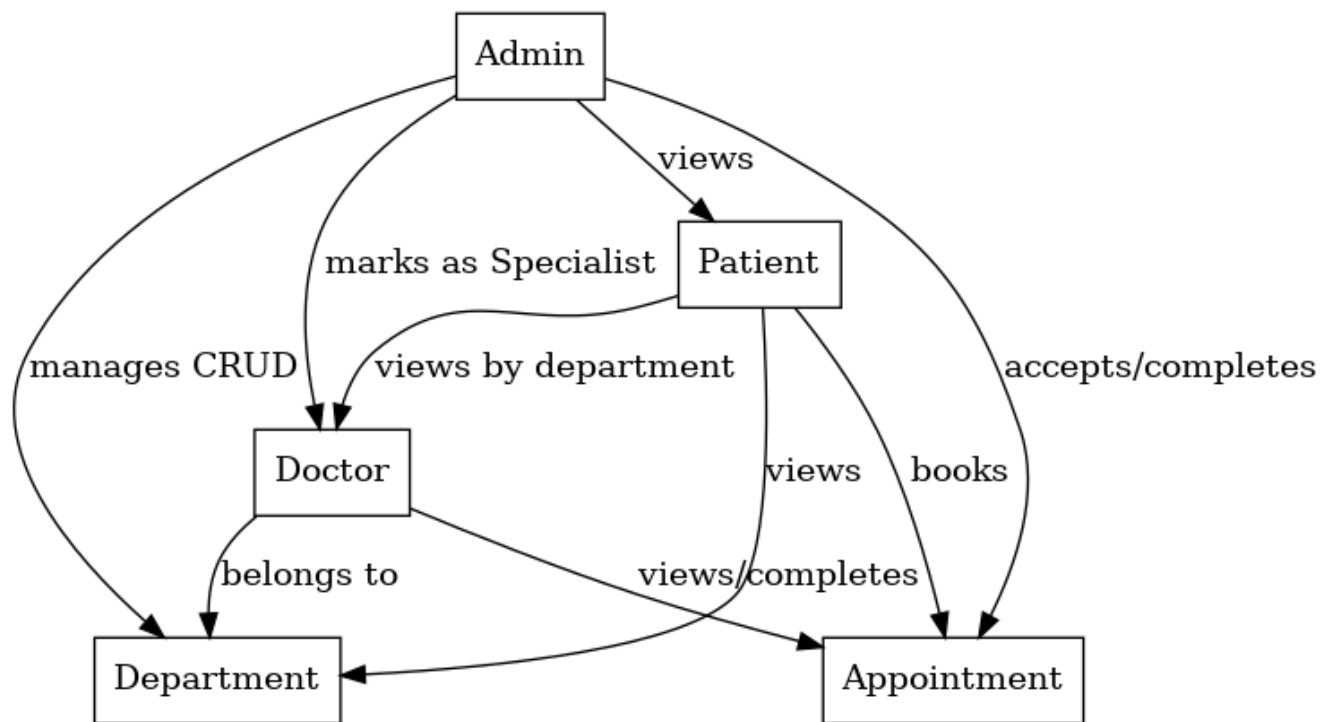
CHAPTER FIVE

SYSTEM DESIGN

Use Case Diagram



ER Diagram



CHAPTER SIX

SYSTEM ANALYSIS

Proposed System

The Primary components of this system are as follows:

1. **User Interface (UI)** – A user-friendly platform (web and mobile) for patients, doctors, and administrators to interact with the system, book appointments, and manage profiles.
2. **Appointment Scheduling System** – A dynamic module that allows patients to book, reschedule, or cancel appointments while ensuring doctors' availability is updated in real time.
3. **Doctor Specialization & Matching Algorithm** – A system that categorizes doctors based on their expertise and matches patients with the most relevant specialists based on symptoms or medical history.
4. **Electronic Medical Records (EMR) Integration** – A secure database for storing patient records, prescriptions, and medical history, ensuring seamless access for authorized personnel.
5. **Telemedicine & Video Consultation Module** – A feature that enables remote consultations via secure video calls, messaging, or AI-driven chatbot assistance.
6. **Secure Payment Gateway** – A system for processing online payments for consultations, treatments, and medical services while ensuring compliance with financial regulations.
7. **Notification & Reminder System** – Automated email, SMS, or in-app notifications to remind patients and doctors about upcoming appointments or necessary follow-ups.
8. **Data Security & Compliance** – Strong encryption, authentication, and compliance with health regulations (HIPAA, GDPR) to protect sensitive patient information.
9. **Analytics & Reporting Dashboard** – A tool for tracking appointments, doctor performance, patient feedback, and system efficiency to improve service quality.

10.Admin & Support Panel – A backend system for administrators to manage users, resolve queries, and monitor platform performance for smooth operation.

Web Application

The main purpose of this Medi-Track web application is to digitize and optimize health services by providing a seamless physician date reservation system with specialized coordination and remote committee support. The aim is to improve accessibility, efficiency and security in terms of interactions in health care for both patients and health profession.

CHAPTER SEVEN

IMPLEMENTATION

Primary Implementation Admin:

The administrator is responsible for handling the system. This involves setting up and dealing with the user accounts, operating the database and maintaining how efficiently the system performs.

Doctor:

The doctor will responsible for the appointment completion. He is also responsible for the updation of profile.

User:

The user can responsible for booking appointment and view doctors by its department.

Exploring Database

Implementation of the MySQL-based and Stock Management System for a small retail has the following steps:

- **Database Design:** For storing data regarding patient and doctor. It is necessary to develop well organized database. The database must contain fields for patient, doctor and admin and the fields need to be interconnected in a proper way.
 - **User Interface Design:** The entire system should have a user -friendly dashboard which allows patients to book and display both appointment and doctors data. The interface should be customizable and function properly on a number of platforms like laptops and mobile phones.
 - **Testing and Deployment:** The system needs to be tested properly in order to ensure that it functions as planned also ensuring that the data precise and secured. When the testing is completed the system can be uploaded on the hosting site and made accessible to all the clients.
 - **Maintenance and Upgrades:** Regular maintenance and upgrades must be performed on the system to ensure that it continues to function effectively and provide the necessary level of service. This may involve fixing bugs, adding new features, and upgrading the underlying software and hardware components.
-

CHAPTER EIGHT

CODING SECTION:

```
<!DOCTYPE html>

<html lang="en" class="scroll-smooth">

<head data-th-replace="{fragment/landing.fragment :: head}"></head>

<body class="bg-gray-100">

<!-- Navbar -->

<nav class="bg-white shadow-lg fixed top-0 left-0 w-full z-50">

  <div class="max-w-7xl mx-auto px-4 sm:px-6 lg:px-8">

    <div class="flex justify-between h-16 items-center">

      <!-- Logo -->

      <a href="/" class="text-2xl font-bold text-blue-500">MediTrack</a>

      <!-- Navigation Links -->

      <div class="hidden md:flex space-x-8">

        <a href="#" class="text-gray-700 hover:text-blue-500">Home</a>

        <a href="#features" class="text-gray-700 hover:text-blue-500">Features</a>

        <a href="#services" class="text-gray-700 hover:text-blue-500">Services</a>

        <a href="#contact-us" class="text-gray-700 hover:text-blue-500">Contact</a>

      </div>

      <!-- Login Button -->

      <a href="/user/login" class="hidden md:block px-4 py-2 bg-blue-500 text-white rounded-lg
hover:bg-blue-600" data-sec-authorize="!isAuthenticated()">Login</a>

      <!-- Mobile Menu Button -->

      <button id="menu-btn" class="md:hidden focus:outline-none">
```

```
        <svg class="w-6 h-6 text-gray-700" fill="none" stroke="currentColor" viewBox="0 0 24 24"
xmlns="http://www.w3.org/2000/svg">
```

```
        <path stroke-linecap="round" stroke-linejoin="round" stroke-width="2" d="M4 6h16M4
12h16m-7 6h7"></path>
```

```
    </svg>
```

```
  </button>
```

```
</div>
```

```
</div>
```

```
<!-- Mobile Menu -->
```

```
<div id="mobile-menu" class="hidden md:hidden bg-white border-t border-gray-200">
```

```
  <a href="#" class="block px-4 py-2 text-gray-700 hover:bg-gray-100">Home</a>
```

```
  <a href="#features" class="block px-4 py-2 text-gray-700 hover:bg-gray-100">Features</a>
```

```
  <a href="#services" class="block px-4 py-2 text-gray-700 hover:bg-gray-100">Services</a>
```

```
  <a href="#contact-us" class="block px-4 py-2 text-gray-700 hover:bg-gray-100">Contact</a>
```

```
  <a href="/user/login" class="block px-4 py-2 bg-blue-500 text-white text-center hover:bg-blue-
600" data-sec-authorize="!isAuthenticated()">Login</a>
```

```
</div>
```

```
</nav>
```

```
<!-- Hero Section -->
```

```
<section class="h-screen flex items-center justify-center bg-white">
```

```
  <div class="max-w-7xl mx-auto px-5 lg:px-10 flex flex-col md:flex-row items-center">
```

```
    <!-- Left Content -->
```

```
    <div class="w-full md:w-1/2 text-center md:text-left">
```

```
      <h1 class="text-5xl font-extrabold text-gray-900">
```

```
        Manage Your Appointments <br> with <span class="text-blue-500">MediTrack Lite</span>
```

```
      </h1>
```

```
      <p class="mt-4 text-lg text-gray-600">
```

```
        A smart and efficient medical appointment system to streamline doctor-patient interaction.
```

```
      </p>
```



```

<!-- Buttons -->

<div class="mt-6 flex justify-center md:justify-start space-x-4">

    <a href="/user/registration" class="px-6 py-3 bg-blue-500 text-white rounded-lg text-lg
font-semibold hover:bg-blue-600">Get Started</a>

    <a href="#features" class="px-6 py-3 border border-blue-500 text-blue-500 rounded-lg text-
lg font-semibold hover:bg-blue-100">Learn More</a>

</div>

</div>

<!-- Right Image -->

<div class="w-full md:w-1/2 flex justify-center">

</div>

</div>

</section>

<!-- Features Section -->

<section id="features" class="py-16 bg-gray-50">

    <div class="max-w-7xl mx-auto px-5 lg:px-10">

        <h2 class="text-4xl font-extrabold text-gray-900 text-center">Key Features</h2>

        <p class="mt-4 text-lg text-gray-600 text-center">Effortlessly manage appointments with our
smart healthcare solution.</p>

<!-- Features Grid -->

<div class="mt-10 grid gap-8 md:grid-cols-2 lg:grid-cols-3">

    <!-- Feature 1 -->

    <div class="bg-white p-6 rounded-lg shadow-md hover:shadow-lg transition duration-300">

        <div class="text-blue-500 text-4xl">

```

```

        <i class="fas fa-calendar-check"></i>

    </div>

    <h3 class="mt-4 text-xl font-bold text-gray-900">Easy Appointment Booking</h3>

    <p class="mt-2 text-gray-600">Patients can book and manage appointments effortlessly
with just a few clicks.</p>

</div>

<!-- Feature 2 -->

<div class="bg-white p-6 rounded-lg shadow-md hover:shadow-lg transition duration-300">

    <div class="text-blue-500 text-4xl">

        <i class="fas fa-user-md"></i>

    </div>

    <h3 class="mt-4 text-xl font-bold text-gray-900">Doctor Dashboard</h3>

    <p class="mt-2 text-gray-600">Doctors get a personalized dashboard to manage schedules
and patient details.</p>

</div>

<!-- Feature 3 -->

<div class="bg-white p-6 rounded-lg shadow-md hover:shadow-lg transition duration-300">

    <div class="text-blue-500 text-4xl">

        <i class="fas fa-bell"></i>

    </div>

    <h3 class="mt-4 text-xl font-bold text-gray-900">Instant Notifications</h3>

    <p class="mt-2 text-gray-600">Automated email and SMS reminders ensure no missed
appointments.</p>

</div>

<!-- Feature 4 -->

<div class="bg-white p-6 rounded-lg shadow-md hover:shadow-lg transition duration-300">

    <div class="text-blue-500 text-4xl">

        <i class="fas fa-file-medical"></i>

    </div>

```

<h3 class="mt-4 text-xl font-bold text-gray-900">Medical Records</h3>

<p class="mt-2 text-gray-600">Patients and doctors can securely access medical histories and prescriptions.</p>

</div>

<!-- Feature 5 -->

<div class="bg-white p-6 rounded-lg shadow-md hover:shadow-lg transition duration-300">

<div class="text-blue-500 text-4xl">

<i class="fas fa-credit-card"></i>

</div>

<h3 class="mt-4 text-xl font-bold text-gray-900">Secure Payments</h3>

<p class="mt-2 text-gray-600">Integrated secure payment gateway for seamless online transactions.</p>

</div>

<!-- Feature 6 -->

<div class="bg-white p-6 rounded-lg shadow-md hover:shadow-lg transition duration-300">

<div class="text-blue-500 text-4xl">

<i class="fas fa-shield-alt"></i>

</div>

<h3 class="mt-4 text-xl font-bold text-gray-900">Privacy & Security</h3>

<p class="mt-2 text-gray-600">All user data is encrypted, ensuring the highest level of privacy protection.</p>

</div>

</div>

</div>

</section>

<!-- Services Section -->

<section id="services" class="py-16 bg-white">

<div class="max-w-7xl mx-auto px-5 lg:px-10">

```

<h2 class="text-4xl font-extrabold text-gray-900 text-center">Our Services</h2>

<p class="mt-4 text-lg text-gray-600 text-center">Explore our comprehensive healthcare
services designed for you.</p>

<!-- Services Grid -->

<div class="mt-10 grid gap-8 md:grid-cols-2 lg:grid-cols-3">

  <!-- Service 1 -->

  <div class="bg-gray-100 p-6 rounded-lg shadow-md hover:shadow-lg transition duration-
300">

    <div class="text-blue-500 text-4xl">

      <i class="fas fa-user-md"></i>

    </div>

    <h3 class="mt-4 text-xl font-bold text-gray-900">24/7 Doctor Consultation</h3>

    <p class="mt-2 text-gray-600">Get expert medical advice anytime through our online
consultation services.</p>

  </div>

  <!-- Service 2 -->

  <div class="bg-gray-100 p-6 rounded-lg shadow-md hover:shadow-lg transition duration-
300">

    <div class="text-blue-500 text-4xl">

      <i class="fas fa-hospital"></i>

    </div>

    <h3 class="mt-4 text-xl font-bold text-gray-900">Hospital Appointments</h3>

    <p class="mt-2 text-gray-600">Book hassle-free hospital appointments with top specialists
near you.</p>

  </div>

  <!-- Service 3 -->

  <div class="bg-gray-100 p-6 rounded-lg shadow-md hover:shadow-lg transition duration-
300">

    <div class="text-blue-500 text-4xl">

```

```

        <i class="fas fa-briefcase-medical"></i>

    </div>

    <h3 class="mt-4 text-xl font-bold text-gray-900">Emergency Support</h3>

    <p class="mt-2 text-gray-600">Quick access to emergency medical assistance and
ambulance services.</p>

</div>

<!-- Service 4 -->

<div class="bg-gray-100 p-6 rounded-lg shadow-md hover:shadow-lg transition duration-
300">

    <div class="text-blue-500 text-4xl">

        <i class="fas fa-prescription-bottle-alt"></i>

    </div>

    <h3 class="mt-4 text-xl font-bold text-gray-900">E-Prescriptions</h3>

    <p class="mt-2 text-gray-600">Receive digital prescriptions from doctors and order
medicines online.</p>

</div>

<!-- Service 5 -->

<div class="bg-gray-100 p-6 rounded-lg shadow-md hover:shadow-lg transition duration-
300">

    <div class="text-blue-500 text-4xl">

        <i class="fas fa-vials"></i>

    </div>

    <h3 class="mt-4 text-xl font-bold text-gray-900">Lab Test Booking</h3>

    <p class="mt-2 text-gray-600">Schedule lab tests and get reports delivered directly to your
dashboard.</p>

</div>

<!-- Service 6 -->

<div class="bg-gray-100 p-6 rounded-lg shadow-md hover:shadow-lg transition duration-
300">

    <div class="text-blue-500 text-4xl">

```

```

        <i class="fas fa-shield-alt"></i>

    </div>

    <h3 class="mt-4 text-xl font-bold text-gray-900">Health Insurance</h3>

    <p class="mt-2 text-gray-600">Access health insurance plans and claim assistance
services.</p>

    </div>

</div>

</div>

</section>

<!-- Contact Section -->

<section id="contact-us" class="py-16 bg-gray-100">

    <div class="max-w-7xl mx-auto px-5 lg:px-10">

        <h2 class="text-4xl font-extrabold text-gray-900 text-center">Contact Us</h2>

        <p class="mt-4 text-lg text-gray-600 text-center">We'd love to hear from you! Reach out to us
for any queries.</p>

    <div class="mt-10 grid gap-10 md:grid-cols-2">

        <!-- Contact Details -->

        <div class="space-y-6">

            <div class="flex items-center space-x-4">

                <i class="fas fa-map-marker-alt text-blue-500 text-3xl"></i>

                <p class="text-gray-700 text-lg">123, MediTrack Lane, OD, INDIA</p>

            </div>

            <div class="flex items-center space-x-4">

                <i class="fas fa-envelope text-blue-500 text-3xl"></i>

                <p class="text-gray-700 text-lg">support@meditrack.com</p>

            </div>

            <div class="flex items-center space-x-4">

```

```

        <i class="fas fa-phone-alt text-blue-500 text-3xl"></i>

        <p class="text-gray-700 text-lg">+91 234 567 8490</p>
    </div>

    <div class="flex items-center space-x-4">

        <i class="fas fa-clock text-blue-500 text-3xl"></i>

        <p class="text-gray-700 text-lg">Mon - Sat: 9 AM - 11 PM</p>
    </div>
</div>

<!-- Contact Form -->
<form class="bg-white p-8 rounded-lg shadow-md">
    <div class="mb-4">
        <label class="block text-gray-700 text-lg font-medium">Full Name</label>
        <input type="text" placeholder="Enter your name"
            class="w-full p-3 border border-gray-300 rounded-lg focus:outline-none focus:ring-2
focus:ring-blue-500">
    </div>

    <div class="mb-4">
        <label class="block text-gray-700 text-lg font-medium">Email</label>
        <input type="email" placeholder="Enter your email"
            class="w-full p-3 border border-gray-300 rounded-lg focus:outline-none focus:ring-2
focus:ring-blue-500">
    </div>

    <div class="mb-4">
        <label class="block text-gray-700 text-lg font-medium">Message</label>
        <textarea rows="4" placeholder="Write your message"
            class="w-full p-3 border border-gray-300 rounded-lg focus:outline-none focus:ring-
2 focus:ring-blue-500"></textarea>
    </div>

```

```

        <button type="submit"
            class="w-full bg-blue-500 text-white font-semibold py-3 rounded-lg hover:bg-blue-600
transition duration-300">
            Send Message
        </button>
    </form>
</div>
</div>
</section>

```

```

<!-- Footer Section -->
<footer class="bg-gray-900 text-gray-400 py-10">
    <div class="max-w-7xl mx-auto px-5 lg:px-10 grid md:grid-cols-4 gap-10">
        <!-- About -->
        <div>
            <h2 class="text-white text-xl font-semibold">MediTrack Lite</h2>
            <p class="mt-3 text-sm">A seamless medical appointment system connecting patients and
doctors efficiently.</p>
        </div>

```

```

        <!-- Quick Links -->
        <div>
            <h3 class="text-white text-lg font-medium">Quick Links</h3>
            <ul class="mt-3 space-y-2">
                <li><a href="#" class="hover:text-blue-400 transition">Home</a></li>
                <li><a href="#features" class="hover:text-blue-400 transition">Features</a></li>
                <li><a href="#services" class="hover:text-blue-400 transition">Services</a></li>
                <li><a href="#contact-us" class="hover:text-blue-400 transition">Contact</a></li>
            </ul>
        </div>

```

```

        <!-- Contact Info -->

```



```
<div>

  <h3 class="text-white text-lg font-medium">Contact Us</h3>

  <ul class="mt-3 space-y-2">

    <li class="flex items-center"><i class="fas fa-map-marker-alt text-blue-400 mr-2"></i> 123,
MediTrack Lane, OD, INDIA</li>

    <li class="flex items-center"><i class="fas fa-envelope text-blue-400 mr-2"></i>
support@meditrack.com</li>

    <li class="flex items-center"><i class="fas fa-phone-alt text-blue-400 mr-2"></i> +91 234
567 8490</li>

  </ul>

</div>
```

```
<!-- Social Media -->

<div>

  <h3 class="text-white text-lg font-medium">Follow Us</h3>

  <div class="mt-3 flex space-x-4">

    <a href="#" class="text-gray-400 hover:text-blue-400 transition"><i class="fab fa-facebook
text-2xl"></i></a>

    <a href="#" class="text-gray-400 hover:text-blue-400 transition"><i class="fab fa-twitter
text-2xl"></i></a>

    <a href="#" class="text-gray-400 hover:text-blue-400 transition"><i class="fab fa-instagram
text-2xl"></i></a>

    <a href="#" class="text-gray-400 hover:text-blue-400 transition"><i class="fab fa-linkedin
text-2xl"></i></a>

  </div>

</div>

</div>

</div>
```

```
<!-- Copyright -->

<div class="mt-10 text-center border-t border-gray-700 pt-5">

  <p class="text-sm">&copy; 2025 MediTrack Lite. All rights reserved.</p>

</div>

</footer>
```

```

<script>

  const menuBtn = document.getElementById('menu-btn');

  const mobileMenu = document.getElementById('mobile-menu');

  menuBtn.addEventListener('click', () => {

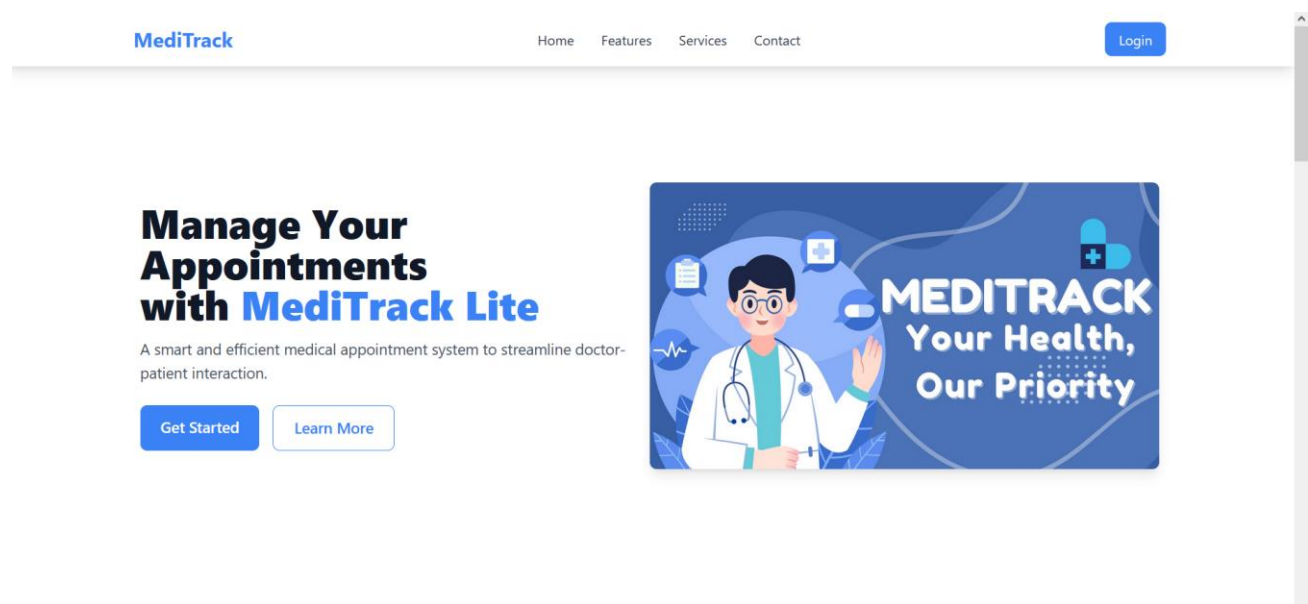
    mobileMenu.classList.toggle('hidden');

  });
</script>

</body>

</html>

```



```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="~{fragment/landing.fragment :: head}"></head>

<body class="bg-gray-100 flex items-center justify-center min-h-screen">

<div class="bg-white shadow-lg rounded-lg overflow-hidden max-w-4xl w-full flex flex-col md:flex-
row">

  <!-- Left Side: Image (Hidden on small screens) -->

  <div class="hidden md:block md:w-1/2">

  </div>

  <!-- Right Side: Login Form -->

  <div class="w-full md:w-1/2 p-8">

    <h2 class="text-2xl font-bold text-center text-gray-800">Welcome Back</h2>

    <p class="text-gray-500 text-center mt-2">Login to your account</p>

    <p data-th-if="{param.error != null}"
      class="bg-red-100 border border-red-400 text-red-700 px-4 py-2 rounded-md text-sm font-
medium mt-2">

      ✖ Wrong username or password. Please try again.

    </p>

    <form class="mt-6" action="/user/login" method="post">

      <div>

        <label for="email" class="block text-sm font-medium text-gray-700">Email</label>

        <input type="email" id="email" name="username" required
          class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 outline-none"
autofocus>

      </div>

      <div class="mt-4">

```

```

        <label for="password" class="block text-sm font-medium text-gray-700">Password</label>
        <input type="password" id="password" name="password" required
            class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 outline-
none">
    </div>

    <div class="flex items-center justify-between mt-4">
        <label class="flex items-center">
            <input type="checkbox" class="text-blue-500">
            <span class="ml-2 text-sm text-gray-600">Remember me</span>
        </label>
        <a href="#" class="text-blue-500 text-sm hover:underline">Forgot password?</a>
    </div>

    <button type="submit"
        class="mt-6 w-full bg-blue-500 text-white py-2 rounded-lg hover:bg-blue-600 transition">
        Login
    </button>

    <input type="hidden" data-th-name="{_csrf.parameterName}" data-th-value="{_csrf.token}">

</form>

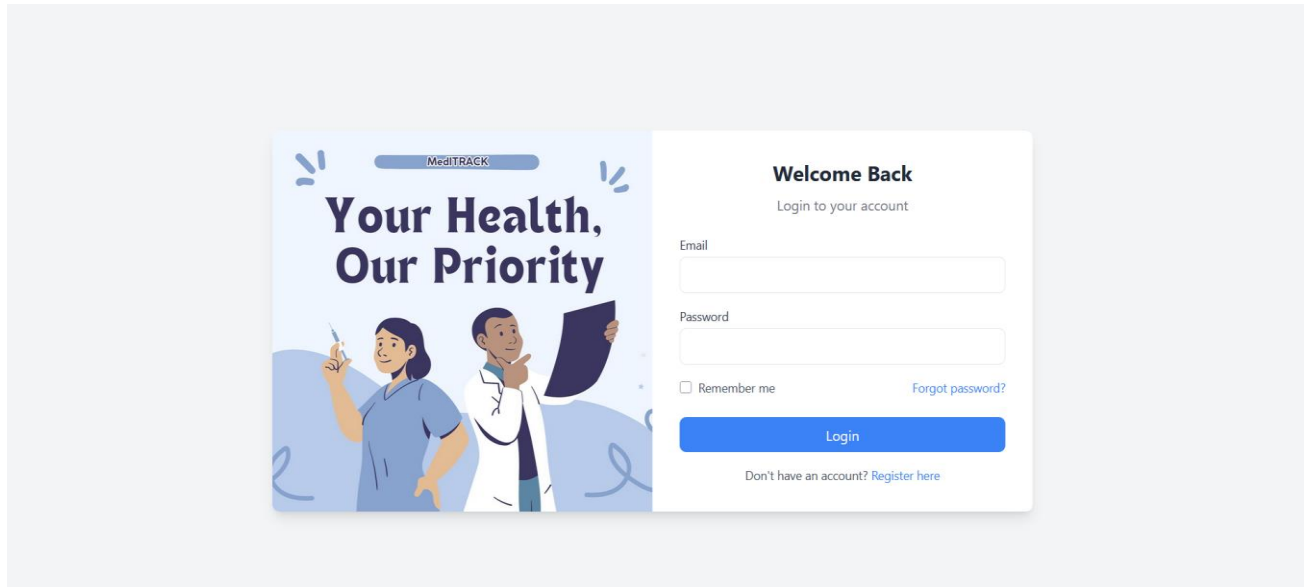
<p class="text-center text-sm text-gray-600 mt-4">
    Don't have an account? <a href="/user/registration" class="text-blue-500
hover:underline">Register here</a>
</p>
</div>

</div>

</body>

```

</html>



```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="~{fragment/landing.fragment :: head}"></head>

<body class="bg-gray-100 flex items-center justify-center min-h-screen">
<div class="bg-white shadow-lg rounded-lg p-8 max-w-6xl w-full">
  <!-- Logo -->
  <div class="flex justify-center mb-4">
    <a href="/">
      
    </a>
  </div>

  <h2 class="text-2xl font-bold text-center text-gray-800">Create an Account</h2>
  <p class="text-gray-500 text-center mt-2">Register as a Client or Doctor</p>

  <div class="mt-6">
    <!-- Registration Form with Grid Layout -->
    <form class="grid grid-cols-1 md:grid-cols-2 gap-6 w-full" action="/user/registration"
method="post"
    enctype="multipart/form-data">

      <!-- Left Column -->
      <div class="space-y-4">
        <!-- Profile Picture Upload Inside Form -->
        <div class="flex flex-col items-center">
          <label class="block text-sm font-medium text-gray-700">Profile Picture</label>
          <div id="dropArea"
            class="w-48 h-48 flex flex-col justify-center items-center border-2 border-dashed
border-gray-400 rounded-lg cursor-pointer text-gray-600"
            ondrop="handleDrop(event)" ondragover="handleDragOver(event)"

```

```

        ondragleave="handleDragLeave(event)">
        <img id="imagePreview" src="" class="hidden w-full h-full object-cover rounded-lg"/>
        <span id="uploadText" class="text-sm text-gray-500">Drag & Drop or Click to
Upload</span>
    </div>

    <input type="file" id="file" name="file" accept="image/*" class="hidden"
        onchange="previewImage(event)">
    <button type="button" onclick="document.getElementById('file').click()"
        class="mt-2 bg-blue-500 text-white px-4 py-2 rounded-lg hover:bg-blue-600
transition">
        Upload Profile Picture
    </button>
</div>

<div>
    <label for="name" class="block text-sm font-medium text-gray-700">Full Name</label>
    <input type="text" id="name" name="name" required
        class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 outline-
none">
</div>

<div>
    <label for="email" class="block text-sm font-medium text-gray-700">Email</label>
    <input type="email" id="email" name="email" required
        class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 outline-
none">
</div>

<div>
    <label for="password" class="block text-sm font-medium text-gray-
700">Password</label>
    <input type="password" id="password" name="password" required

```

```

        class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 outline-
none">
    </div>
</div>

<!-- Right Column -->
<div class="space-y-4">
    <div>
        <label for="age" class="block text-sm font-medium text-gray-700">Age</label>
        <input type="number" id="age" name="age" required
            class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 outline-
none">
    </div>

    <div>
        <label for="userRole" class="block text-sm font-medium text-gray-700">Register
As</label>
        <select id="userRole" name="userRole" onchange="toggleFields()" required
            class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300
outline-none">
            <option value="CLIENT">Client</option>
            <option value="DOCTOR">Doctor</option>
        </select>
    </div>

    <!-- Doctor-Specific Fields -->
    <div id="doctorFields" class="hidden space-y-4">
        <div>
            <label for="licenseNumber" class="block text-sm font-medium text-gray-700">License
            Number</label>
            <input type="text" id="licenseNumber" name="licenseNumber"
                class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300
outline-none">

```


</div>

<div>

<label for="departmentId" class="block text-sm font-medium text-gray-700">Specialization</label>

<select id="departmentId" name="departmentId" class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 outline-none">

<option data-th-each="department : \${departments} "

data-th-value="\${department.id}"

data-th-text="\${department.departmentName}"></option>

</select>

</div>

<div>

<label for="hourlyRate" class="block text-sm font-medium text-gray-700">Hourly Rate (INR)</label>

<input type="text" id="hourlyRate" name="hourlyRate" class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 outline-none">

</div>

<div>

<label for="experienceYears" class="block text-sm font-medium text-gray-700">Years of

Experience</label>

<input type="number" id="experienceYears" name="experienceYears" class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 outline-none">

</div>

</div>

<!-- Client-Specific Fields -->

```
<div>
  <label for="contactNumber" class="block text-sm font-medium text-gray-700">Contact
Number</label>
  <input type="text" id="contactNumber" name="contactNumber" required
    class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 outline-
none">
</div>
```

```
<div>
  <label for="address" class="block text-sm font-medium text-gray-700">Address</label>
  <textarea id="address" name="address" rows="3" required
    class="mt-1 w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300
outline-none"></textarea>
</div>
```

```
<button type="submit"
  class="mt-4 w-full bg-blue-500 text-white py-2 rounded-lg hover:bg-blue-600
transition">
```

Register

```
</button>
  <input type="hidden" data-th-name="{_csrf.parameterName}" data-th-
value="{_csrf.token}">
</div>
</form>
</div>
```

```
<p class="text-center text-sm text-gray-600 mt-4">
  Already have an account? <a href="/user/login" class="text-blue-500 hover:underline">Login
here</a>
</p>
</div>
```

```
<script src="/script/user.registration.js"></script>
```

</body>

</html>

MEDITRACK

Create an Account

Register as a Client or Doctor

Profile Picture

Drag & Drop or Click to Upload

Upload Profile Picture

Full Name

Email

Password

Age

Register As

Client

Contact Number

Address

Register

```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="{fragment/doctor :: head}"></head>

<body>

<div data-th-replace="{fragment/doctor ::
doctorTemplate(~{doctor/fragment/appointment.component :: appointmentContent}, 'fas fa-
calendar-check', 'Appointments')}"></div>

</body>

</html>

```

Dr. mks

Dashboard

Appointments

Patients

Profile

Logout

Appointments

0

Dr. mks

Patient Name	Date	Time	Status	Action
abhi	March 27, 2025	05:00 PM	COMPLETED	<div></div>

1

»

```

<!DOCTYPE html>

<html lang="en">

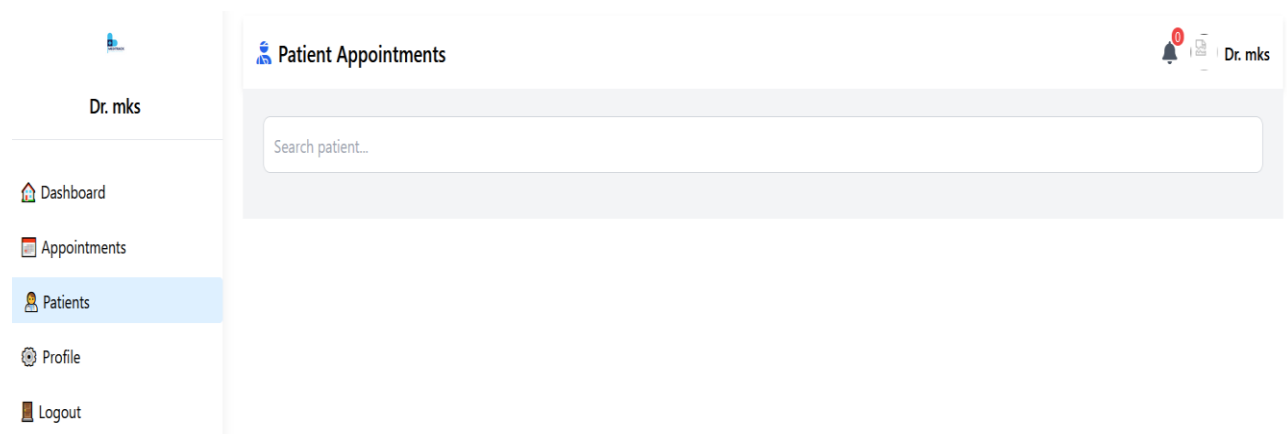
<head data-th-replace="{fragment/doctor :: head}"></head>

<body>

<div data-th-replace="{fragment/doctor :: doctorTemplate(~{doctor/fragment/patient.component
:: patientContent}, 'fas fa-user-injured', 'Patient Appointments')}"></div>

</body>
</html>

```



```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="{fragment/doctor :: head}"></head>

<body>

<script src="/script/doctor.profile.js"></script>

<div data-th-replace="{fragment/doctor :: doctorTemplate(~{doctor/fragment/profile.component ::
profileContent}, 'fas fa-user-md', 'Doctor Profile & Settings')}"></div>

</body>

</html>

```

The screenshot displays a web application titled "Doctor Profile & Settings". On the left, a sidebar menu for "Dr. mks" contains links to Dashboard, Appointments, Patients, Profile (which is highlighted), and Logout. The main content area features a profile card for "Dr. mks" with the email "mks@gmail.com". Below the card, there are several input fields: "Specialization", "License Number" (displaying "234500321"), "Hourly Rate (\$)" (displaying "1200.0"), "Age" (displaying "29"), "Experience (Years)" (displaying "3"), and "Address" (displaying "bbsr,odisha"). A blue "Save Changes" button is positioned at the bottom of the form.

```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="{fragment/client :: head}"></head>

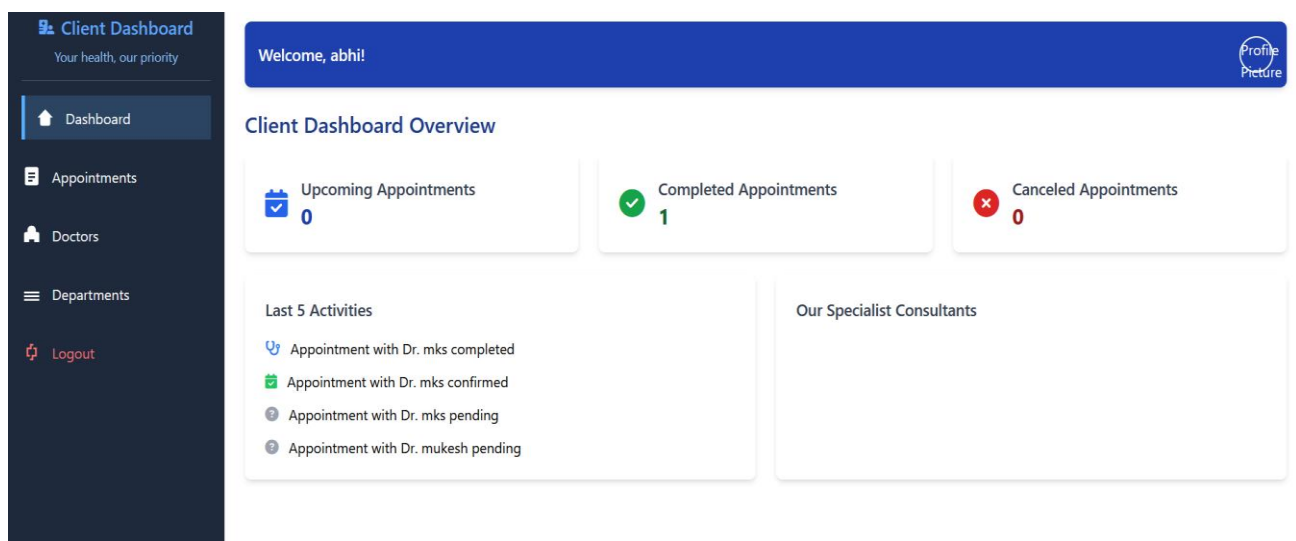
<body>

<div data-th-replace="{fragment/client :: clientTemplate(~{client/fragment/dashboard.component
:: dashboardContent})}"></div>

</body>

</html>

```



```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="{fragment/client :: head}"></head>

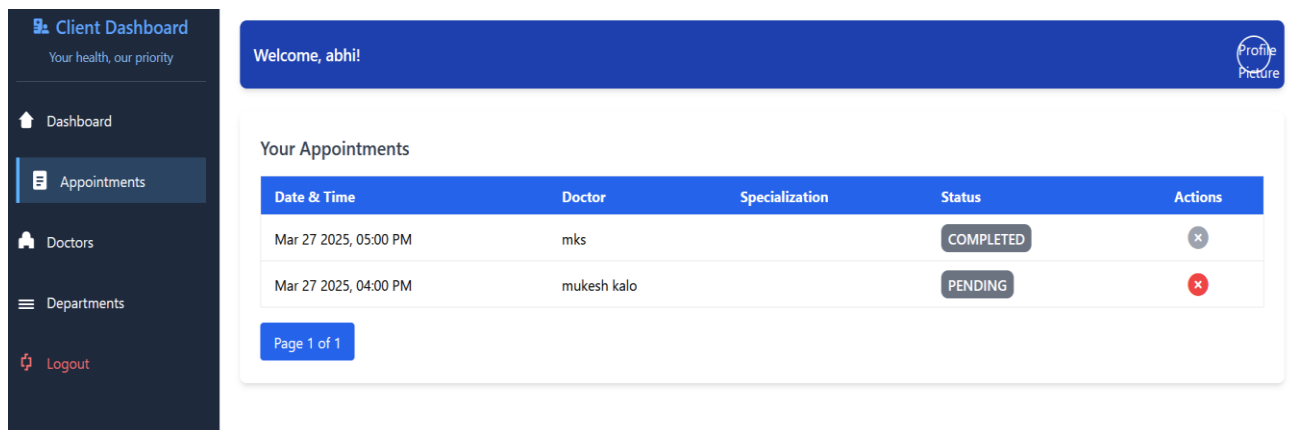
<body>

<div data-th-replace="{fragment/client ::
clientTemplate(~{client/fragment/appointment.component :: appointmentContent})}"></div>

</body>

</html>

```



```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="{fragment/client :: head}"></head>

<body>

```



```
<div data-th-replace="{fragment/client :: clientTemplate(~{client/fragment/doctor.component :: doctorContent})}"></div>
```

```
<div id="doctorModal" class="fixed inset-0 bg-gray-900 bg-opacity-50 hidden flex justify-center items-center">
```

```
<!-- Modal Box -->
```

```
<div class="bg-white w-96 p-6 rounded shadow-lg">
```

```
<!-- Modal Header -->
```

```
<div class="flex justify-between items-center border-b pb-2 mb-4">
```

```
<h2 class="text-xl font-semibold">Doctor Details</h2>
```

```
<button onclick="closeModal()" class="text-gray-500 hover:text-gray-700">X</button>
```

```
</div>
```

```
<!-- Doctor Information -->
```

```
<div class="space-y-3">
```

```
<div class="flex items-center">
```

```

```

```
<div>
```

```
<p class="text-lg font-bold" id="doctorName">Dr. John Doe</p>
```

```
<p class="text-gray-600" id="doctorSpecialization">Cardiologist</p>
```

```
</div>
```

```
</div>
```

```
<p><strong>Email:</strong> <span id="doctorEmail">johndoe@example.com</span></p>
```

```
<p><strong>Experience:</strong> <span id="doctorExperience">12 Years</span></p>
```

```
<p><strong>Hourly Rate:</strong> <span id="doctorRate">₹1500/hr</span></p>
```

```
<p><strong>License Number:</strong> <span id="doctorLicense">XYZ123456</span></p>
```

```
<p><strong>Address:</strong> <span id="doctorAddress">123, Medical Street,
City</span></p>
```

```
</div>
```

```
<!-- Close Button -->
```

```

        <div class="mt-4 flex justify-end">
            <button onclick="closeModal()" class="bg-gray-300 px-4 py-2 rounded hover:bg-gray-400">Close</button>
        </div>
    </div>
</div>

<div id="appointmentModal" class="fixed inset-0 bg-black bg-opacity-50 hidden flex justify-center items-center">
    <div class="bg-white w-96 p-6 rounded-lg shadow-lg">
        <div class="flex justify-between items-center mb-4">
            <h2 class="text-xl font-bold">Request an Appointment</h2>
            <button onclick="closeAppointmentModal()" class="text-gray-500 hover:text-gray-700">&times;</button>
        </div>

        <!-- Appointment Form -->
        <form id="appointmentForm" method="post" action="appointments">
            <!-- Select Date -->
            <div class="mb-3">
                <label for="appointmentDate" class="block text-sm font-medium text-gray-700">Date</label>
                <input type="date" id="appointmentDate" name="appointmentDate" class="w-full border rounded px-3 py-2">
            </div>

            <!-- Select Time -->
            <div class="mb-3">
                <label for="appointmentTime" class="block text-sm font-medium text-gray-700">Time</label>
                <input type="time" id="appointmentTime" name="appointmentTime" class="w-full border rounded px-3 py-2">
            </div>
        </form>
    </div>
</div>

```

```

<!-- Additional Notes -->

<div class="mb-3">

  <label for="appointmentNotes" class="block text-sm font-medium text-gray-700">Notes
(Optional)</label>

  <textarea id="appointmentNotes" name="notes" class="w-full border rounded px-3 py-2"
rows="3" placeholder="Enter any additional details..."></textarea>

</div>

<!-- Submit Button -->

<button type="submit" class="w-full bg-blue-500 text-white px-4 py-2 rounded hover:bg-blue-
600">

  Request Appointment

</button>

<input type="hidden" name="doctorId" id="doctorIdField">

<input type="hidden" name="_csrf" data-th-value="{_csrf.token}">

</form>

</div>

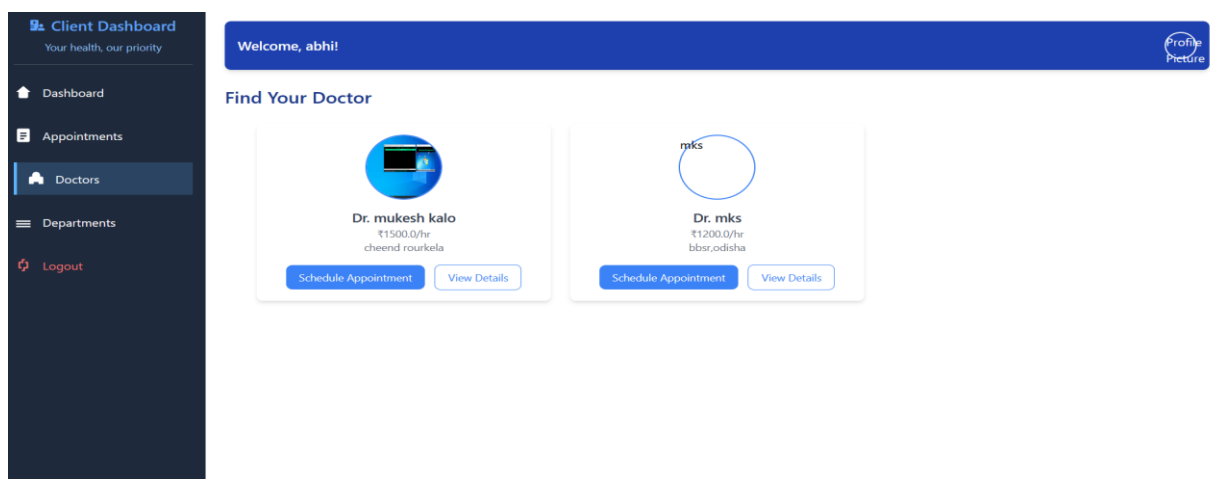
</div>

<script type="text/javascript" src="/script/client.doctor.js"></script>

</body>

</html>

```



```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="{fragment/client :: head}"></head>

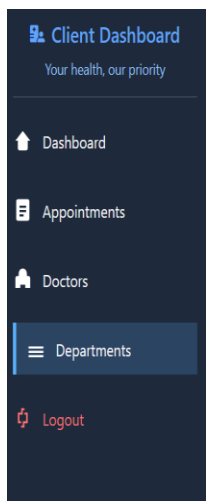
<body>

<div data-th-replace="{fragment/client ::
clientTemplate(~{client/fragment/department.component :: departmentContent})}"></div>

</body>

</html>

```



Explore Departments

Admin

```
<!DOCTYPE html>
```

```
<html lang="en">
```

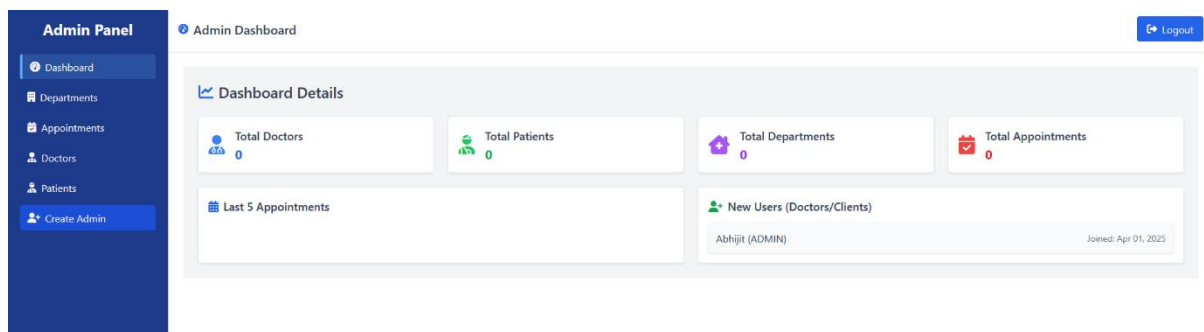
```
<head data-th-replace="{fragment/admin :: head}"></head>
```

```
<body>
```

```
<div data-th-replace="{fragment/admin ::  
adminTemplate(~{admin/fragment/dashboard.component :: dashboardContent}, 'fas fa-  
tachometer-alt', 'Admin Dashboard')}"></div>
```

```
</body>
```

```
</html>
```



```
<!DOCTYPE html>
```

```
<html lang="en">
```

```
<head data-th-replace="{fragment/admin :: head}"></head>
```

```
<body>
```

```
<script src="/script/admin.department.js" type="text/javascript"></script>
```

```
<div data-th-replace="{fragment/admin ::  
adminTemplate(~{admin/fragment/department.component :: departmentContent}, 'fas fa-building',  
'Department')}"></div>
```

```
<!-- Overlay Background -->
```

```
<div id="addDepartmentModal" class="fixed inset-0 bg-gray-900 bg-opacity-50 flex items-center justify-center hidden">
```

```
<!-- Modal Box -->
```

```
<div class="bg-white rounded-lg shadow-lg w-full max-w-lg p-6 relative">
```

```
<!-- Close Button -->
```

```
<button onclick="closeModal()" class="absolute top-3 right-4 text-gray-500 hover:text-red-500">
```

```
<i class="fas fa-times text-xl"></i>
```

```
</button>
```

```
<!-- Modal Title -->
```

```
<h2 class="text-2xl font-semibold text-gray-700 flex items-center space-x-2 mb-4">
```

```
<i class="fas fa-building text-blue-600"></i>
```

```
<span>Add Department</span>
```

```
</h2>
```

```
<!-- Department Form -->
```

```
<form action="/admin/create/department" method="POST" enctype="multipart/form-data" class="space-y-4">
```

```
<input type="hidden" name="_csrf" data-th-value="{$_csrf.token}">
```

```
<!-- Department Name -->
```

```
<div>
```

```
<label class="text-gray-600 font-medium">Department Name</label>
```

```
<input type="text" name="departmentName" required
```

```
class="w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 focus:outline-none">
```

```
</div>
```

```
<!-- Description -->
```

```
<div>
```

```
<label class="text-gray-600 font-medium">Description</label>
```

```

        <textarea name="departmentDescription" required rows="3"
            class="w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 focus:outline-
none"></textarea>
    </div>

    <!-- Upload Image -->
    <div>
        <label class="text-gray-600 font-medium">Upload Image</label>
        <input type="file" id="departmentImageInput" name="file" accept="image/*"
            onchange="previewDepartmentImage(event)"
            class="w-full px-4 py-2 border rounded-lg focus:ring focus:ring-blue-300 focus:outline-
none">

        <!-- Image Preview & Remove Button -->
        <div id="imagePreviewContainer" class="mt-2 hidden">
            <img id="departmentImagePreview" class="w-32 h-32 object-cover rounded-md">
            <button type="button" onclick="removeImage()"
                class="mt-2 px-4 py-1 bg-red-500 text-white rounded hover:bg-red-600">
                Remove
            </button>
        </div>
    </div>

    <input type="hidden" name="departmentId">

    <!-- Submit Button -->
    <div class="flex justify-end space-x-2">
        <button type="button" onclick="closeModal()" class="bg-gray-400 text-white px-4 py-2
rounded-lg hover:bg-gray-500">
            Cancel
        </button>
        <button type="submit" class="bg-blue-600 text-white px-4 py-2 rounded-lg hover:bg-blue-
700">

```

```

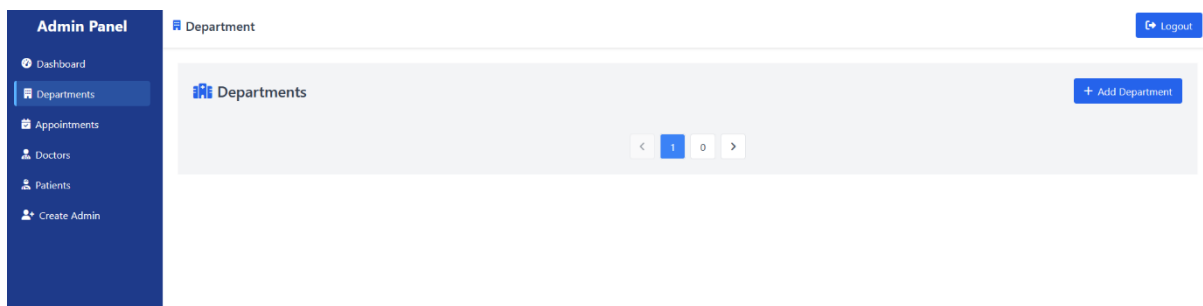
        <i class="fas fa-plus-circle"></i> Add Department
    </button>
</div>
</form>
</div>
</div>

```

```

</body>
</html>

```



```

<!DOCTYPE html>
<html lang="en">
<head data-th-replace="~{fragment/admin :: head}"></head>
<body>

```

```

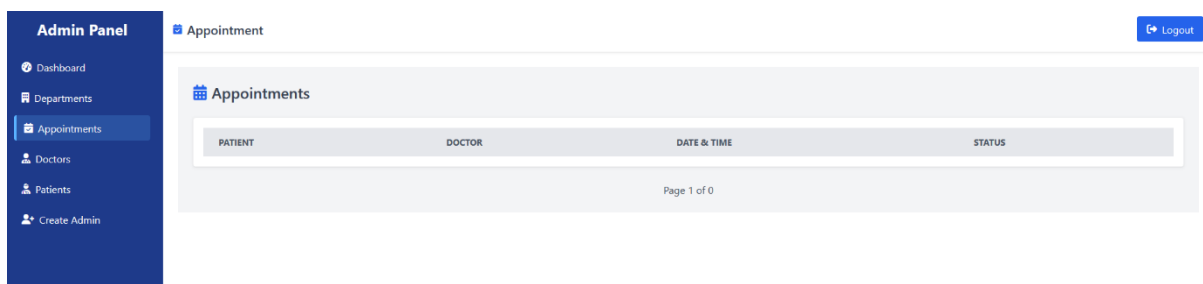
<div data-th-replace="~{fragment/admin ::
adminTemplate(~{admin/fragment/appointment.component :: appointmentContent}, 'fas fa-
calendar-check', 'Appointment')}"></div>

```

```

</body>
</html>

```




```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="{fragment/admin :: head}"></head>

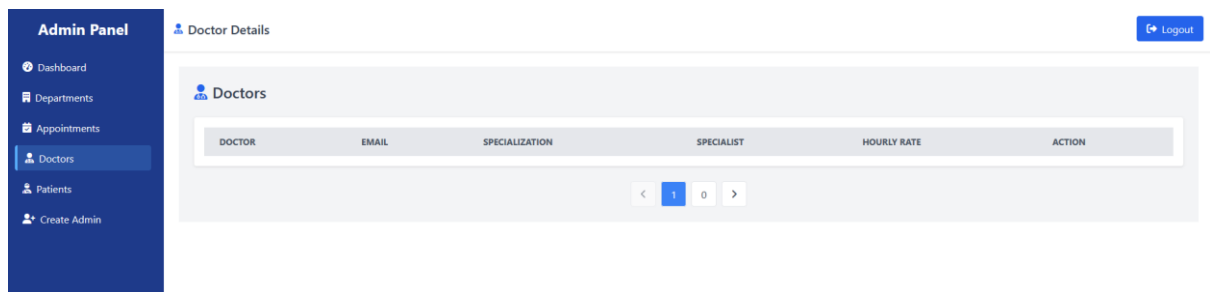
<body>

<div data-th-replace="{fragment/admin :: adminTemplate(~{admin/fragment/doctor.component ::
doctorContent}, 'fas fa-user-md', 'Doctor Details')}"></div>

</body>

</html>

```



```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="{fragment/admin :: head}"></head>

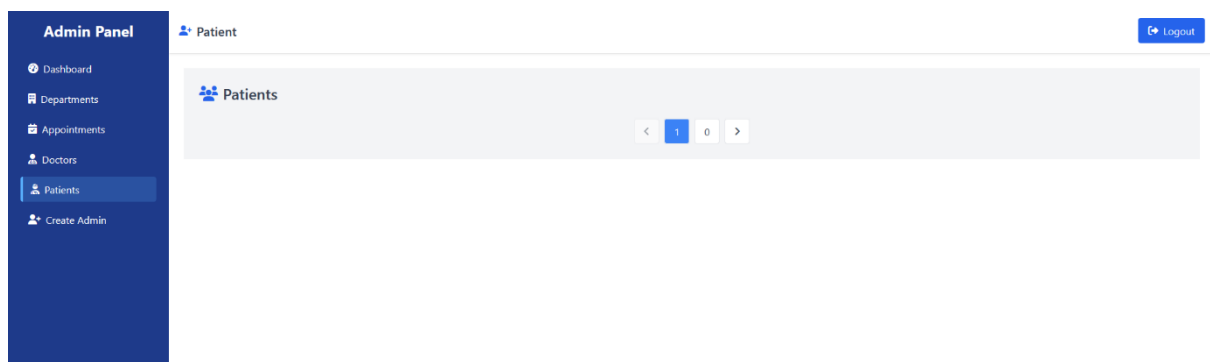
<body>

<div data-th-replace="{fragment/admin :: adminTemplate(~{admin/fragment/patient.component ::
patientContent}, 'fas fa-user-plus', 'Patient')}"></div>

</body>

</html>

```



```

<!DOCTYPE html>

<html lang="en">

<head data-th-replace="{fragment/admin :: head}"></head>

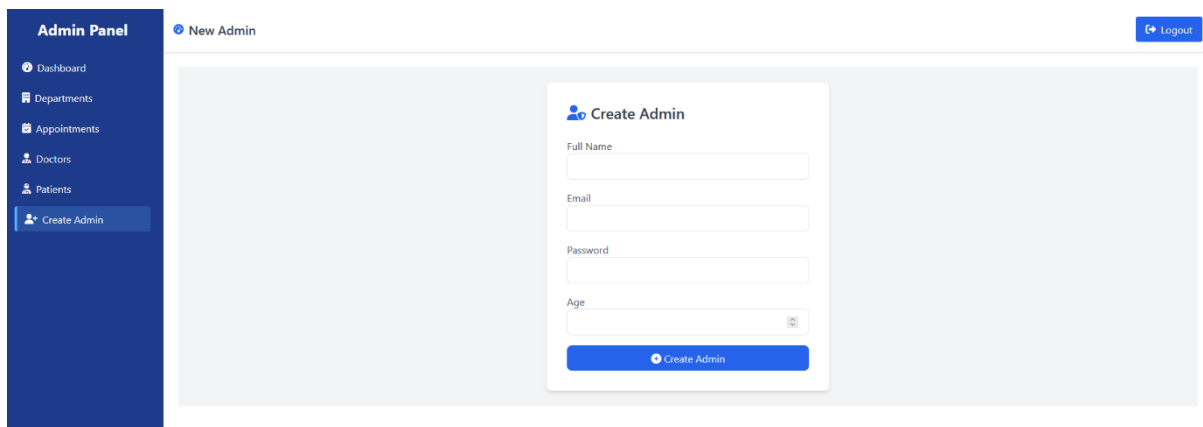
<body>

<div data-th-replace="{fragment/admin :: adminTemplate(~{admin/fragment/create-admin.component :: createAdminContent}, 'fas fa-tachometer-alt', 'New Admin')}"></div>

</body>

</html>

```



Thymeleaf

```

<dependency>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-thymeleaf</artifactId>
</dependency>

```

Security config

```
package edu.rims.medi_track.config;
```

```
import edu.rims.medi_track.constants.UserRole;
```

```
import edu.rims.medi_track.repository.UserRepository;
```

```
import lombok.RequiredArgsConstructor;
```

```
import org.springframework.context.annotation.Bean;
```

```
import org.springframework.context.annotation.Configuration;
```

```
import org.springframework.security.config.Customizer;
```

```
import  
    org.springframework.security.config.annotation.web.builders.HttpSecurity;
```

```
import org.springframework.security.core.userdetails.UserDetailsService;
```

```
import  
    org.springframework.security.core.userdetails.UsernameNotFoundException;
```

```
import org.springframework.security.crypto.bcrypt.BCryptPasswordEncoder;
```

```
import org.springframework.security.crypto.password.PasswordEncoder;
```

```
import org.springframework.security.web.SecurityFilterChain;
```

```
@Configuration
```

```
@RequiredArgsConstructor
```

```
public class SecurityConfig {
```

```
    private final UserRepository userRepository;
```

```
    @Bean
```

```
    SecurityFilterChain securityFilterChain(HttpSecurity http) throws Exception {
```

```

http.authorizeHttpRequests(
    request -> request
        .requestMatchers("/style/**", "/script/**",
            "/images/**").permitAll()
        .requestMatchers("/file/**", "/user/**", "/").permitAll()
        .requestMatchers("/doctor/**").hasRole(UserRole.DOCTOR.toString())
        .requestMatchers("/client/**").hasRole(UserRole.CLIENT.toString())
        .requestMatchers("/admin/**").hasRole(UserRole.ADMIN.toString())
        .anyRequest().authenticated());
http.formLogin(form -> form.loginPage("/user/login")
    .successForwardUrl("/login/success"));
http.logout(Customizer.withDefaults());
return http.build();
}

```

@Bean

```

PasswordEncoder encoder() {
    return new BCryptPasswordEncoder(12);
}

```

@Bean

```

UserDetailsService detailsService() {
    return (username) -> {
        var user = userRepository.findByEmail(username)
    }
}

```

```
        .orElseThrow(() -> new UsernameNotFoundException("User Not Found"));
    return org.springframework.security.core.userdetails.User.builder()
        .username(username)
        .password(user.getPassword())
        .roles(user.getUserRole().toString())
        .build();
    };
}

}
```

CHAPTER NINE

TESTING

Introduction

Software testing is a critical stage in the development of the Medi-Track project to ensure reliability, security and optimal performance. Given the fact that the application handles sensitive patient data and real-time doctor dates, rigorous functional tests are performed to see if key features such as date booking, specialisation, telehealth services work seamlessly. Security testing is essential to protect your electronic medical records (EMR) and to comply with regulations such as HIPAA and GDPR. Performance testing allows the system to master high traffic loads without downtime, and usability testing ensures smooth experiences for patients and health service providers. Integration testing is performed to verify the seamless interaction between APIs from third-party providers, payment gateways and EMR systems. Additionally, automated tests of regression tests are performed to catch problems early on, reducing the risk of system errors. By following a structured testing approach, Medi-Track systems ensure the accuracy, security and efficiency of digital health services.

Unit Testing

Unit testing is an essential issue of software testing for Medi-Track initiatives, making sure that character additives and functions work as anticipated. This manner assessments small, unbiased gadgets of the software. B. schedule, scientific Specialization, Certification, and price Processing Modules. each unit is tested on its own the usage of automatic unit tests frequently written in test frameworks such as Jest (for JavaScript), Pytest (for Python), and JUnit (for Java). Fine statistics and dependency injection is used to simulate real situations without affecting the entire gadget. by identifying and putting off mistakes early on, testing unit exams improves code excellent, reliability, and protection, and reduces the danger of disasters in later improvement levels. additionally, difficult techniques for unit testing make sure smoother integration and scalability. In other words, MEDl generation systems for clinical operations are sturdy and green.

CHAPTER TEN

CONCLUSION

The Medi-Track assignment is a transformative strategy to modernize healthcare via improving health practitioner appointments, professional coordination and telehealth offerings. via the combination of superior technology together with comfortable digital clinical statistics (EMR), automated planning, and actual time notification, the gadget improves accessibility, efficiency and affected person care. strong security measures ensure compliance with healthcare policies which include HIPAA and GDPR, and defend sensitive scientific information. The machine guarantees reliability and seamless capability via rigorous software testing, including unit testing, integration testing, and performance evaluation. in the long run, the Medi-Track project closes the gap between patient and fitness carrier companies, reduces latency, optimizes resource allocation, and improves the overall healthcare revel in. Its scalable and user-pleasant approach gives precious capital in an growing digital fitness surroundings.

Project Limitation

1. Requires a stable internet connection for appointment booking, telemedicine consultations, and accessing medical records.
2. Despite security measures, there is always a risk of cyberattacks, data breaches, or unauthorized access to sensitive patient information.
3. Some doctors and patients, especially in rural or less tech-savvy regions, may find it difficult to transition from traditional healthcare systems to digital platforms.
4. Server crashes, software bugs, or maintenance periods may disrupt appointment scheduling and telemedicine services.
5. Telemedicine consultations cannot fully replace in-person visits for cases requiring physical diagnosis, lab tests, or emergency care.

CHAPTER ELEVEN

FUTURE ENHANCEMENTS

The Medi-Track project has several future enhancements that can improve healthcare accessibility, efficiency, and security:

- **AI-Powered Diagnosis & Predictive Analytics:** Implement AI to analyze patient data, predict potential health risks, and assist doctors in early diagnosis.
- **IoT-Based Health Monitoring:** Integrate wearable devices to track real-time vitals and provide instant alerts for critical health conditions.
- **Blockchain for Secure Medical Records:** Use blockchain technology to ensure tamper-proof, decentralized, and secure patient data management.
- **VR-Based Telemedicine:** Enhance remote consultations with virtual reality for a more immersive doctor-patient interaction.
- **Multilingual AI Chatbots:** Develop AI-driven chatbots capable of handling patient queries and appointment bookings in multiple languages.
- **Automated Insurance & Billing:** Integrate automated claim processing and digital payments to streamline medical transactions.
- **Big Data for Personalized Treatment:** Utilize big data analytics to create personalized healthcare plans based on patient history and lifestyle.

REFERENCES

Websites & Online Resources

- <https://www.geeksforgeeks.org/>
- <https://www.tpointtech.com/>
- https://github.com/Project-Based-Learning-IT/healthcare-appointment-scheduling-app?utm_source=chatgpt.com
- <https://www.wikipedia.org/>