# INTERNSHIP REPORT

*A report submitted in partial fulfilment of the requirements for the Award of Degree of*

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE AND ENGINEERING (GAMING TECHNOLOGY)**

by

**Kumkum Verma - 20BCG10078**

**DURATION: 15TH MAY 2023 TO 15TH JULY 2023**

**ACADAMIC YEAR - 2022-2023**

**SCHOOL OF COMPUTING SCIENCE AND ENGINEERING**

**VIT BHOPAL UNIVERSITY**

**April –2024**

## SCHOOL OF COMPUTING SCIENCE AND ENGINEERING
## VIT BHOPAL UNIVERSITY

## INTERNSHIP CERTIFICATE

This is to certify that the “INTERNSHIP REPORT” submitted by KUMKUM VERMA (20BCG10078) for the internship done by her during the academic year 2022-2023 from 15-05-2023 to 15-07-2023 (2 Months), is the partial fulfilment of the requirements for the awarding the degree of B.Tech – CSE
(GAMING TECHNOLOGY).

**Internship In-Charge**

Dr. Ajay Sharma
Assistant Professor

**Program Chair**

Dr. Balaji A
Senior Assistant Professor (Gr-2)

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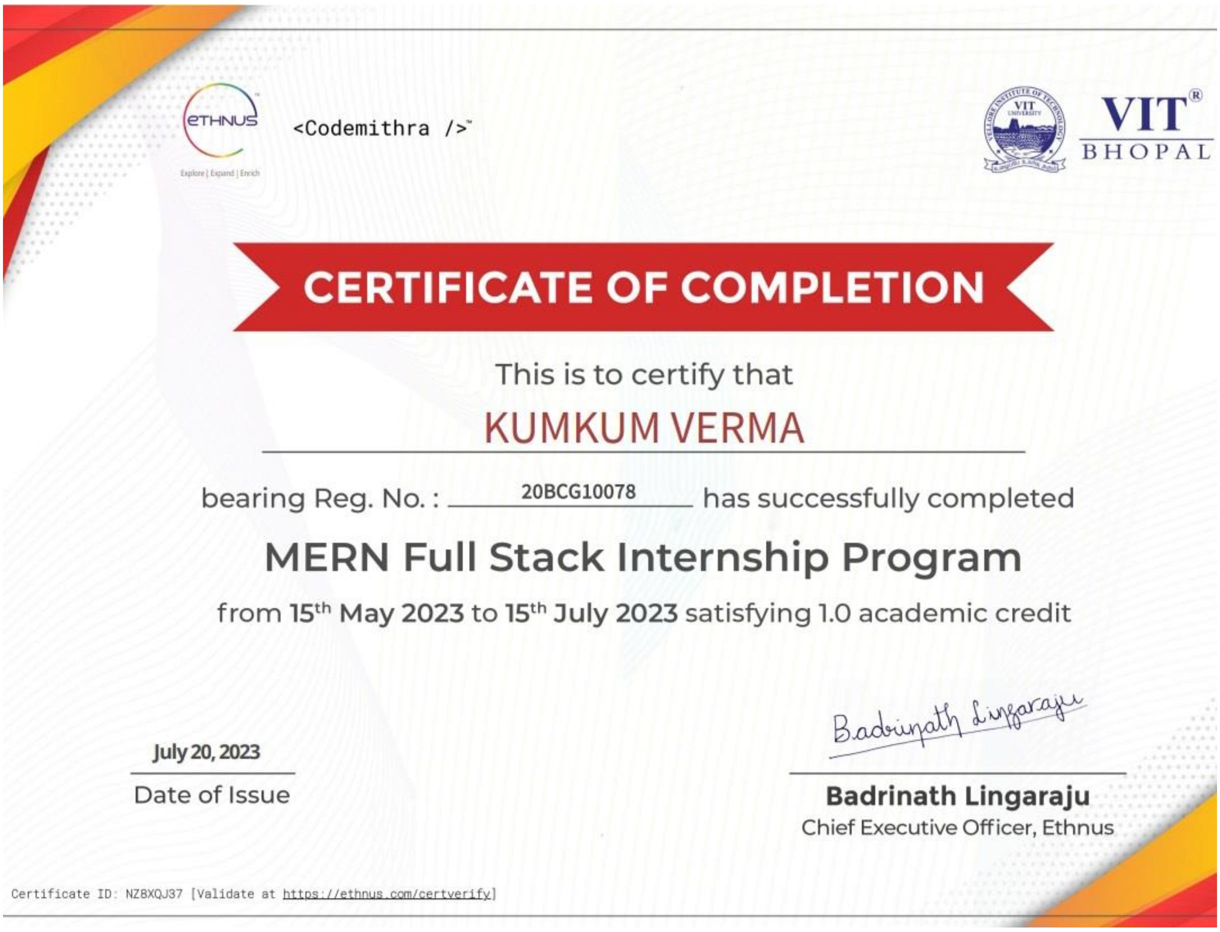
## INTERNSHIP CERTIFICATE

Category – I: Certificate & PAT/PC – invitation/ circular mail regarding

MERN Full Stack Internship Program by Ethnus CodeMithra



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CERTIFICATE OF COMPLETION

This is to certify that

KUMKUM VERMA

bearing Reg. No. : 20BCG10078 has successfully completed

MERN Full Stack Internship Program

from 15th May 2023 to 15th July 2023 satisfying 1.0 academic credit

July 20, 2023

Date of Issue

Badrinath Lingaraju

Badrinath Lingaraju

Chief Executive Officer, Ethnus

Certificate ID: NZ8XQJ37 [Validate at https://ethnus.com/certverify]

# ACKNOWLEDGEMENT

I want to express my sincere gratitude to Dr. Shri Ram Sir, my placement officer, for his unflinching support and the priceless chance he gave me to be placed in this internship. My professional development has been completely transformed by this experience, which has improved my knowledge of the industry and my skill set.

I am really appreciative to the entire Ethnus CodeMithra team because I started this adventure as an entrant. Throughout my internship, they have shown me nothing but the most kindness, patience, and unwavering guidance. I sincerely appreciate all of the team members' contributions; they have been priceless.

I would also like to thank VIT University for making this amazing internship opportunity possible. I am very grateful to Dr. Ajay Sharma Sir and Dr. Balaji A, the CSE (Gaming Technology) Programme Chair, for their support, encouragement, and faith in my abilities.

With a plethora of academic and practical information acquired, I feel empowered as I wrap out this internship. I'm enthusiastic and well-prepared to confidently start my future profession immediately.

# ABSTRACT

This report presents the development and implementation of a Hospital Management System (HMS) using the MERN stack. By allowing users to register as physicians or patients, the system makes scheduling and managing appointments easier.

The application offers a smooth and effective platform for consumers and healthcare providers alike by utilizing MongoDB, Express.js, React.js, and Node.js. User registration, authentication, scheduling of appointments, and an intuitive user interface are among the essential elements. The paper describes the features, user experience design, system architecture, difficulties encountered during development, and upcoming enhancements.

The idea, creation, and implementation of an all-inclusive Hospital Management System (HMS) employing the MERN stack—MongoDB, Express, React, and Node.js—are described in this study. By acting as a digital infrastructure, the HMS facilitates effective communication between medical professionals and patients as well as expedited appointment scheduling and administration procedures. Users can register, authenticate, and access features specific to their positions as doctors or patients using user-friendly interfaces.

To ensure durability and scalability, the application makes use of MongoDB for data storage, Express.js for developing backend APIs, React.js for creating dynamic frontend interfaces, and Node.js for server-side execution. The study goes into great detail about the architectural design, emphasizing how important aspects like data management, appointment scheduling, and user authentication are integrated.

# OBJECTIVES

The primary objectives of the CRM system project are described as follows:

The challenges involve in this project can be broadly categorized into the following categories:

- **Effective Appointment Management:** Create a system that makes it simple for patients to make appointments with doctors depending on their availability. This will simplify the scheduling procedure for medical personnel as well as patients.
- **User Registration and Authentication:** To protect sensitive healthcare data, implement secure user registration and authentication procedures to guarantee that only authorized users—doctor and patient—can access the system.
- **Using role-based access control :** we may distinguish between patients and physicians by giving each group access to information and features that are particular to their responsibilities in the healthcare system.
- **Easy Navigation and Interaction:** Provide an intuitive and user-friendly interface so that users can quickly access and make use of the system's capabilities without running into usability issues.
- **Data Management and Security:** To prevent unauthorized access or breaches of sensitive information, implement strong data management procedures, such as the secure storage and retrieval of patient and appointment data. You should also follow industry-standard security measures.
- **Scalability and Performance:** The system should be designed to be both scalable and performant so that it can handle an increase in the number of users and appointments without sacrificing dependability or speed, especially under high load scenarios.
- **Integration with External Systems:** To improve the functionality and interoperability of the Hospital Management System, look into potential for integration with external systems or services, such as electronic health record (EHR) systems or payment gateways.
- **User Feedback and Iterative Improvement:** Utilizing usability testing to collect user feedback and incorporating iterative enhancements based on user recommendations and system performance indicators, this approach guarantees that the system is always changing to successfully fulfill the demands of its users.
- **Compliance with Regulatory Standards:** To protect patient privacy and confidentiality and follow industry best practices for healthcare data management, make sure you are in compliance with all applicable regulatory standards and requirements, including HIPAA (Health Insurance Portability and Accountability Act).

## CHALLENGES

The challenges involve in this project can be broadly categorized into the following categories:

- **Real-time changes:** It might be difficult to provide real-time changes for availability and appointment scheduling, particularly in a multi-user setting. Efficient data management and synchronization are necessary to guarantee that changes made by one user are instantly reflected to other users.

- **Security concerns:** Since healthcare systems handle private patient data, security must be given high attention. Careful implementation and testing are necessary to guarantee that user authentication, data encryption, and access control measures are strong enough to stop illegal access or data breaches.

- **Scalability:** The system must be able to accommodate growing loads without compromising performance as the number of users and appointments rises. It can be difficult to scale the program horizontally while preserving data consistency in order to split the burden over several servers.

- **User Experience Design:** It takes careful consideration of usability principles and input from stakeholders to design a user-friendly interface that satisfies the demands of medical personnel and patients while also adhering to accessibility standards and best practices.

- **Integration with External Systems**: Technical issues pertaining to data interoperability, API compatibility, and security considerations may arise when integrating the hospital management system with external systems, such as electronic health records (EHR) or payment gateways.

- **Deployment and Maintenance:** To reduce downtime and guarantee continuous service, meticulous planning and coordination are needed for both the deployment of the application to production settings and the management of ongoing maintenance, which includes software updates, performance monitoring, and troubleshooting.

- **User Adoption and Training:** It might be difficult to get patients and medical personnel to embrace the new system and to provide them with the necessary training and assistance so they can use its features and functions efficiently, particularly in settings where technology adoption may be re

## EXPERIENCE LEARNED THROUGH INTERNSHIP

The experience learned through this internship in explained in detail below:

**1. Technical Skills Development**

- **MERN Stack Proficiency:** Acquired a thorough understanding of developing fullstack web apps with Express, React, Node.js, and MongoDB; this includes designing database schemas, developing RESTful APIs, and implementing user interfaces.Discover how to create and manage solid MongoDB database structures.
- **Optimal Data Security Procedures:** gained hands-on experience putting authentication, authorization, encryption, and input validation into practice to guarantee adherence to data protection laws such as HIPAA.
- **Scalability and Performance:** Acquired techniques to maximize application scalability and performance in order to effectively manage growing data volumes and user loads.
- **Principles of Integration:** Examined the complexities of integrating with third-party systems and APIs pertinent to the healthcare industry.
- **Deployment and CI/CD:** Learned about continuous integration/continuous deployment pipelines and experienced deploying projects to production settings.concerning pipelines for continuous integration and deployment.

**2. Project Management and Collaboration**

- **Agile Methodology:** Engaged in agile development practices, including sprint planning, retrospectives, and daily standups, contributing to a collaborative team environment.
- **Version Control (Git):** Practiced essential Git workflows for version control, branching, merging, and collaborative coding.
- **Team Communication:** Honed technical and interpersonal communication skills through regular interactions with mentors and team members.
- **Problem-Solving:** Developed proficiency in troubleshooting issues, debugging code, and creatively addressing technical challenges with the support of a team..

### 3. Domain-Specific Knowledge

- **HMS Workflows:** Gained insights into the operational processes and workflows within the HMS domain, understanding the unique requirements and challenges.
- **System Design:** Developed an understanding of designing complex software systems
- **User-Centred Design:** Focused on building intuitive user interfaces tailored to the specific needs of HMS users.

### 4. Guidance from Ethnus CodeMithra

- **Mentorship:** Advice from seasoned developers expedited learning and encouraged adoption of industry best practices.
- **Code Reviews:** Received helpful criticism on design patterns, code quality, and efficiency gains, which improved general coding competence.
- **Real-World Context:** worked on projects with real-world use cases, which increased the internship's practical relevance and impact.

### 5. Beyond Technical Skills

- **Adaptability:** Developed adaptability skills by navigating dynamic project environments and adjusting to evolving requirements and technological changes.
- **Time Management:** Practiced effective time management skills in balancing multiple tasks and meeting project deadlines within the internship timeframe.
- **Professionalism:** Cultivated professional communication, work ethic, and an understanding of workplace expectations, laying a strong foundation for future career endeavors.

## WEEKLY PROGRESS OF INTERNSHIP ACTIVITIES

| 1ST WEEK | DATE | DAY | LEARNED/EXPERIENCED TOPIC / MODULE / TASK |
|---|---|---|---|
| | 15-05-2023 | Monday | Create tables using HTML |
| | 16-05-2023 | Tuesday | Create lists and hyperlinks using HTML |
| | 17-05-2023 | Wednesday | Create registration form using HTML |
| | 18-05-2023 | Thursday | Add validity and layout to the form |
| | 19-05-2023 | Friday | Use frames to divide page into sections using HTML |

| 2ND WEEK | DATE | DAY | LEARNED/EXPERIENCED TOPIC / MODULE / TASK |
|---|---|---|---|
| | 22-05-2023 | Monday | Use of different types of bullet points using CSS |
| | 23-05-2023 | Tuesday | Create navigation bar using CSS |
| | 24-05-2023 | Wednesday | Add layout and design to tables using CSS |
| | 25-05-2023 | Thursday | Create various shapes using CSS |
| | 26-05-2023 | Friday | Use text wrap using CSS |

| 3RD WEEK | DATE | DAY | LEARNED/EXPERIENCED TOPIC / MODULE / TASK |
|---|---|---|---|
| | 29-05-2023 | Monday | Create sections in a table using Bootstrap |
| | 30-05-2023 | Tuesday | Create a form layout with validity using Bootstrap |
| | 31-05-2023 | Wednesday | Add page responsiveness using Bootstrap |
| | 01-06-2023 | Thursday | Create cards using Bootstrap |
| | 02-06-2023 | Friday | Create a replica of a website using Bootstrap |

| 4TH WEEK | DATE | DAY | LEARNED/EXPERIENCED TOPIC / MODULE / TASK |
|---|---|---|---|
| | 05-06-2023 | Monday | Use buttons to toggle functions using JavaScript |
| | 06-06-2023 | Tuesday | Add validity to form fields using JavaScript |
| | 07-06-2023 | Wednesday | Create a login page including form validity |
| | 08-06-2023 | Thursday | Create and implement simple functions using JavaScript |
| | 09-06-2023 | Friday | Create animation using JavaScript |

| 5TH WEEK | DATE | DAY | LEARNED/EXPERIENCED TOPIC / MODULE / TASK |
|---|---|---|---|
| | 12-06-2023 | Monday | Created admin sidebar |
| | 13-06-2023 | Tuesday | Created doctor’s list |
| | 14-06-2023 | Wednesday | Created doctor’s dashboard |
| | 15-06-2023 | Thursday | Code optimization |
| | 16-06-2023 | Friday | Error fixing |

| 6TH WEEK | DATE | DAY | LEARNED/EXPERIENCED TOPIC / MODULE / TASK |
|---|---|---|---|
| | 19-06-2023 | Monday | Project Scope Definition (Meet with mentors/stakeholders), Requirements Gathering |
| | 20-06-2023 | Tuesday | Technology Stack Finalization, Database Design (MongoDB Schemas) |
| | 21-06-2023 | Wednesday | Project Setup (Repo, Dev Environments), Basic Backend Structure (Express.js) |
| | 22-06-2023 | Thursday | Start Core Backend APIs (CRUD for Patient Data) |
| | 23-06-2023 | Friday | Continue Backend API Development (Appointment, Basic Authentication) |

| 7TH WEEK | DATE | DAY | LEARNED/EXPERIENCED TOPIC / MODULE / TASK |
|---|---|---|---|
| | 26-06-2023 | Monday | React Project Setup, Wireframes for Key Components |
| | 27-06-2023 | Tuesday | Build React Components, Implement Data Fetching |
| | 28-06-2023 | Wednesday | Continue Frontend Development, Focus on User Authentication and Login |
| | 29-06-2023 | Thursday | Frontend: Patient Data Display, Appointment Scheduling Form |
| | 30-06-2023 | Friday | Continued work on Doctor’s Dashboard |

| 8TH WEEK | DATE | DAY | LEARNED/EXPERIENCED TOPIC / MODULE / TASK |
|---|---|---|---|
| | 03-07-2023 | Monday | Code optimization |
| | 04-07-2023 | Tuesday | Thorough Testing (Unit tests, End-to-end tests), Bug Fixing |
| | 05-07-2023 | Wednesday | UI Refinement |
| | 06-07-2023 | Thursday | Code Review, Optimization, Preparation for Final Demo |
| | 07-07-2023 | Friday | Project Presentation |

## CONCLUSION

In summary, the creation and deployment of the Hospital Management System (HMS) with the MERN stack mark an important turning point in the use of technology to improve administrative effectiveness and healthcare delivery. By combining MongoDB, Express.js, React.js, and Node.js, we have developed a dependable and expandable platform that makes it easier for patients and medical professionals to communicate with one another and expedites the scheduling and administration of appointments.

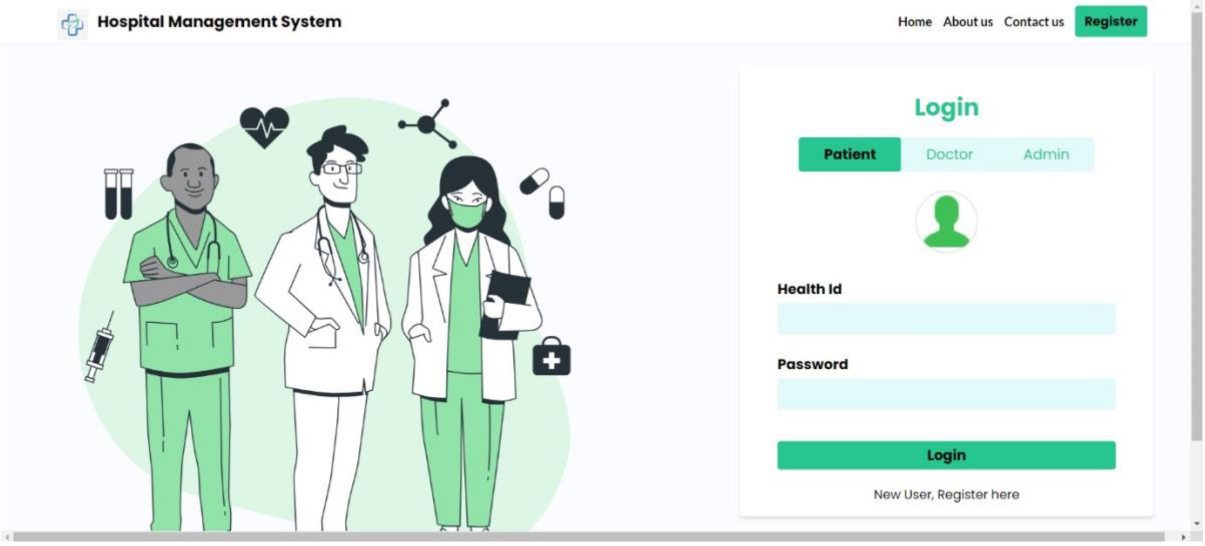
In order to enhance user experience, the HMS provides a number of features, such as rolebased access control, user registration and authentication, and an easy-to-use interface for booking appointments.

## BIBLIOGRAPHY

- Building applications with mongodb and backbone by jesse black, o reilly media - https://www.oreilly.com/library/view/building-applications-with/9781449334566/
- MongoDB Documentation - https://docs.mongodb.com/
- "Full Stack React Projects" by Shama Hoque, Packt Publishing - https://www.packtpub.com/product/full-stack-react-projects/9781839215414

# ANNEXURE – I

## Screenshotsof the website:



Hospital Management System

Home About us Contact us Register

Login

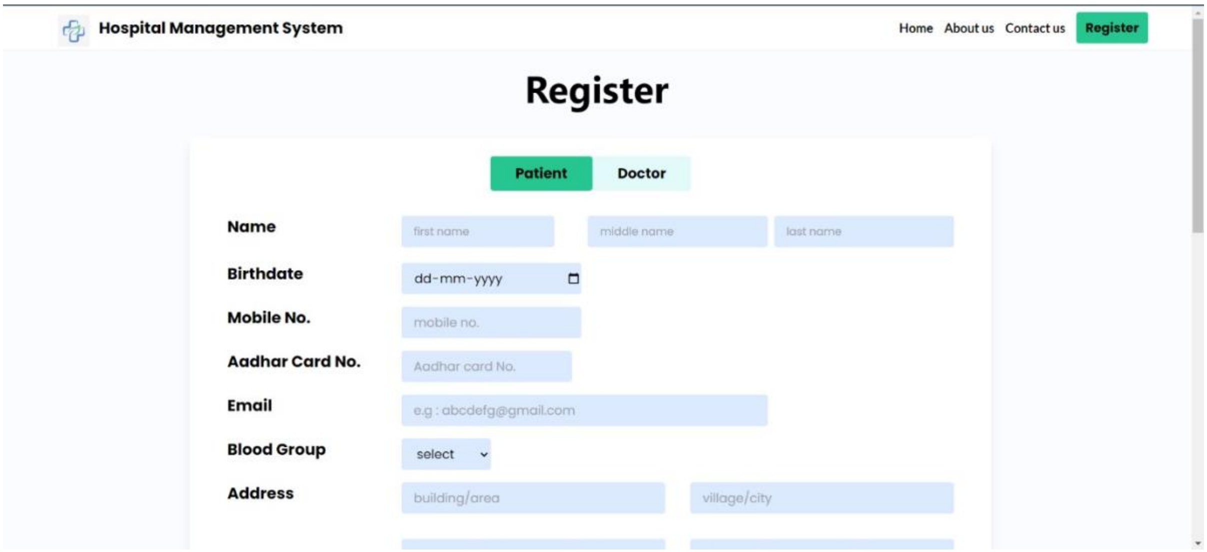
Patient Doctor Admin

Health Id

Password

Login

New User, Register here



Hospital Management System

Home About us Contact us Register

Register

Patient Doctor

Name first name middle name last name

Birthdate dd-mm-yyyy

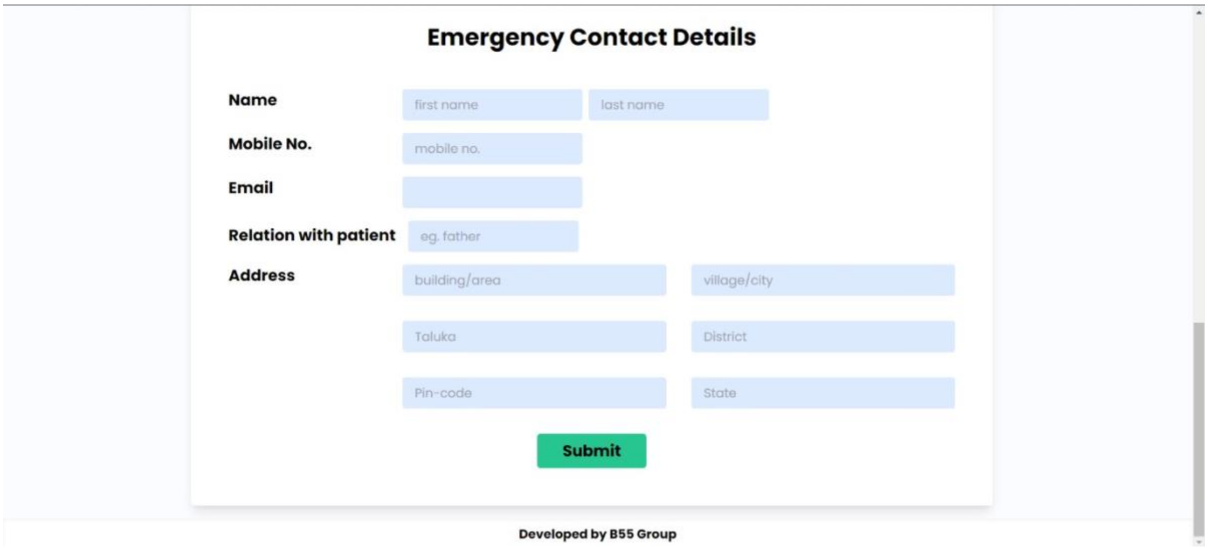
Mobile No. mobile no.

Aadhar Card No. Aadhar card No.

Email e.g : abcdefg@gmail.com

Blood Group select

Address building/area village/city



Emergency Contact Details

Name first name last name

Mobile No. mobile no.

Email

Relation with patient eg. father

Address building/area village/city

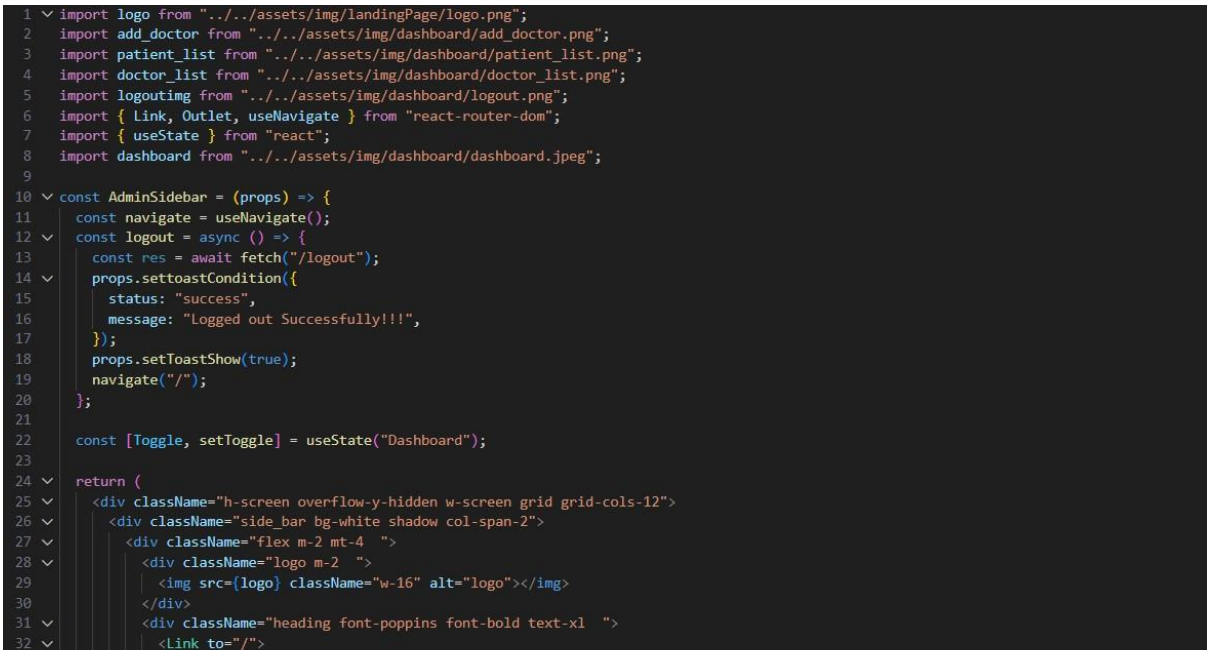
Taluka District

Pin-code State

Submit

Developed by B55 Group

## Screenshots of the Code:

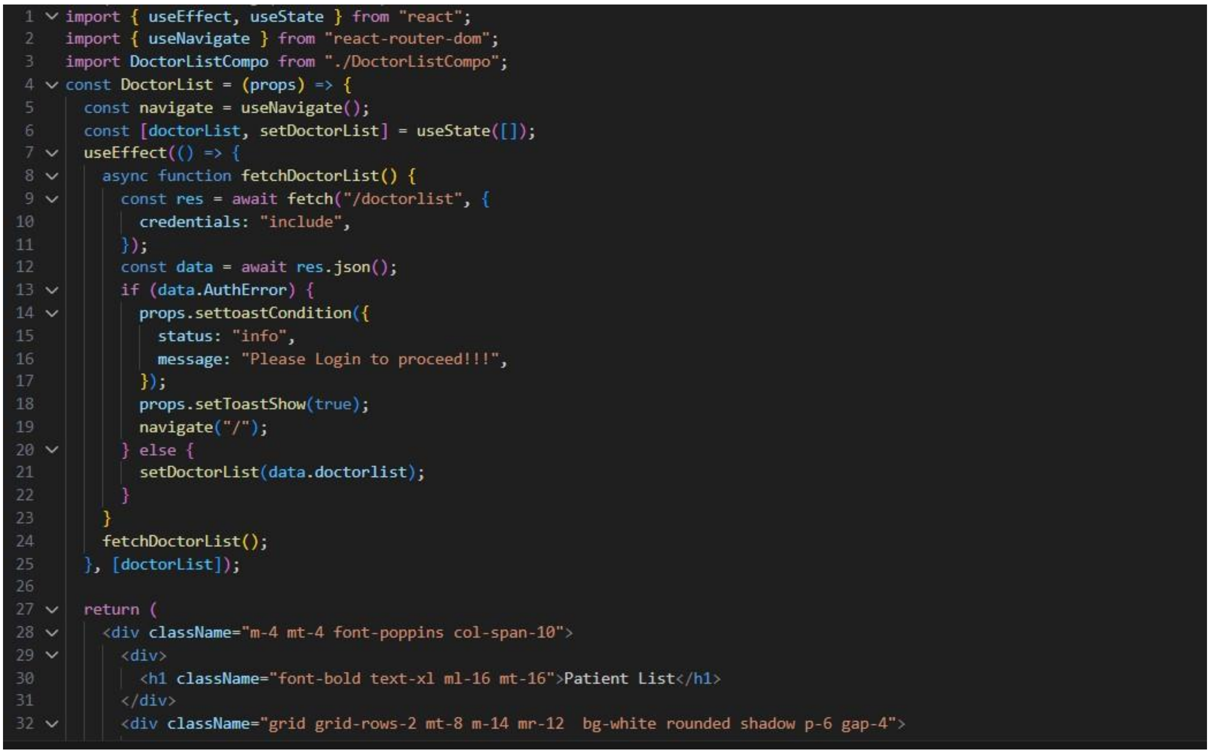


```
import logo from "../../assets/img/landingPage/logo.png";
import add_doctor from "../../assets/img/dashboard/add_doctor.png";
import patient_list from "../../assets/img/dashboard/patient_list.png";
import doctor_list from "../../assets/img/dashboard/doctor_list.png";
import logoutimg from "../../assets/img/dashboard/logout.png";
import { Link, Outlet, useNavigate } from "react-router-dom";
import { useState } from "react";
import dashboard from "../../assets/img/dashboard/dashboard.jpeg";

const AdminSidebar = (props) => {
  const navigate = useNavigate();
  const logout = async () => {
    const res = await fetch("/logout");
    props.settoastCondition({
      status: "success",
      message: "Logged out Successfully!!!",
    });
    props.setToastShow(true);
    navigate("/");
  };

  const [Toggle, setToggle] = useState("Dashboard");

  return (
    <div className="h-screen overflow-y-hidden w-screen grid grid-cols-12">
      <div className="side_bar bg-white shadow col-span-2">
        <div className="flex m-2 mt-4  ">
          <div className="logo m-2  ">
            <img src={logo} className="w-16" alt="logo"></img>
          </div>
          <div className="heading font-poppins font-bold text-xl  ">
            <Link to="/">
```



```
import { useEffect, useState } from "react";
import { useNavigate } from "react-router-dom";
import DoctorListCompo from "./DoctorListCompo";
const DoctorList = (props) => {
  const navigate = useNavigate();
  const [doctorList, setDoctorList] = useState([]);
  useEffect(() => {
    async function fetchDoctorList() {
      const res = await fetch("/doctorlist", {
        credentials: "include",
      });
      const data = await res.json();
      if (data.AuthError) {
        props.settoastCondition({
          status: "info",
          message: "Please Login to proceed!!!",
        });
        props.setToastShow(true);
        navigate("/");
      } else {
        setDoctorList(data.doctorlist);
      }
    }
    fetchDoctorList();
  }, [doctorList]);

  return (
    <div className="m-4 mt-4 font-poppins col-span-10">
      <div>
        <h1 className="font-bold text-xl ml-16 mt-16">Patient List</h1>
      </div>
      <div className="grid grid-rows-2 mt-8 m-14 mr-12  bg-white rounded shadow p-6 gap-4">
```