PROJECT

REPORT

ON

LUNG CANCER PREDICATION SYSTEM

SUBMITTED

TO

ROURKELA INSTITUTE OF MANAGEMENT STUDIES

(As a partial fulfilment of the requirement for the award of Degree)

FOR

MASTER IN COMPUTER APPLICATION

SUBMITED BY

AMIT KUMAR PATEL

REGD NO: 2205260001

MCA 4TH SEMESTER

(2022-2024)

ROURKELA INSTITUTE OF MANAGEMENT STUDIES

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CERTIFICATE OF EXAMINATON

This is to certify that this project report entitled **"Smart Health Monitoring System"** submitted by **Amit Kumar Patel** of 4th semester, **Rourkela Institute of Management Studies, Rourkela,** is accepted as partial fulfilment of requirements for the degree in Master of Computer Applications, under **Biju Patnaik 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 **"LUNGS CANCER PREDICATION SYSTEM"** has been and submitted by **Amit Kumar Patel,** M.C.A 2022-2024, **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 theaward of any other degree.

I wish all success in his life.

DEAN, ACADEMICS

RIMS,

Rourkela

Prof. Bibhudendu
Panda Head of The
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StudiesRourkela

CERTIFICATE

This is to certify that **Amit Kumar Patel** student of **M.C.A, Rourkela Institute of Management Studies, Rourkela, Odisha** of Session 2022-2024 has completed the project successfully.

(Prof. Bibhudendu Panda)

DECLARATION

I, **Amit Kumar Patel**, hereby declare that the project report entitled "**LUNGS CANCER PREDICATION SYSTEM**" 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.

Amit Kumar Patel

ACKNOWLGEMENT

I would like to express my gratitude to **Prof. Damodor Nayak**(**RIMS**) for his guidance and support during the project work.

I am deeply indebted to **Rourkela Institute of Management Studies, Chhend, Rourkela,** for providing me an opportunity to undertake a project work entitled **"LUNGS and CANCER PREDICATION SYSTEM".**

I amgrateful 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.

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ABSTRACT

The Lung Cancer Prediction System is an innovative project that aims to improve early detection and prediction of lung cancer. By utilizing advanced deep learning techniques and medical data analysis, this system has the potential to revolutionize the field. Early detection is crucial in improving patient outcomes for this prevalent and deadly form of cancer.

CONTRIBUTION OF INDIVIDUAL TEAM MEMBERS

Name of the Student(s)	Registration Number	Contributions
Amit Kumar Patel	2205260001	Front Design and Team Lead.
Harsh Sharma	2205260009	Backend Implementation and UI Integration

GANTT CHART

ID	Task Name	No. of days	Bar Representation
1	Project Management		
1.1	Project Initiation	10	
1.2	Project planning	5	
2	Analysis	15	
3	Design	20	
4	Implementation	25	
5	Testing	5	
6	Evaluation	2	

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CHAPTER # 1

Introduction

Contents:

- Introduction
- Problem Definition
- Aim
- Objective
- Goal
- Need of System

Introduction to the System:

Lung Cancer Prediction System using Efficient Net is a deep learning project that aims to predict the presence of lung cancer based on chest X-ray images. It is built using Python Django web framework and utilizes an SQLite database. The system has three main modules - user, admin, and doctor.

The user module includes features such as sign up, login, prediction, view prediction history, and a list of doctors available based on the user's location. After the prediction, if the user is diagnosed with a disease, doctors in the same city will be recommended to the user. The user can also edit their profile, change their password, and logout.

The admin module includes login, a dashboard to view user and prediction results counts, view prediction history, registered users, registered doctors, change password, and logout.

The doctor module includes login, view prediction history of patients from the same city, edit profile, change password, and logout. This feature helps doctors to get patient information for lead generation.

Problem Definition:

The problem that the Lung Cancer Prediction System using efficient Net aims to address is the early detection and prediction of lung cancer. Lung cancer is one of the most common types of cancer, and it is often not detected until it has progressed to an advanced stage, which can limit treatment options and lead to a poorer prognosis. By using deep learning and image analysis techniques, this system seeks to accurately predict the likelihood of a patient having lung cancer based on their medical imaging data, allowing for earlier detection and more effective treatment options.

Aim:

The aim of the Lung Cancer Prediction System using efficient Net is to develop an accurate and efficient deep learning model that can predict the likelihood of a patient having lung cancer based on the analysis of chest CT scan images. The system aims to provide a reliable and quick prediction that can help in the early detection of lung cancer, which can lead to more successful treatment outcomes. Additionally, the system aims to provide a user-friendly interface for both users and medical professionals to easily access and interpret the prediction results.

Objective:

The main objectives of the Lung Cancer Prediction System using efficient Net are:

1. To develop an accurate deep learning model for predicting the presence of lung cancer in patients based on CT scan images.
2. To provide an easy-to-use web application for users to input their CT scan images and receive a prediction of the likelihood of lung cancer.
3. To create a user-friendly interface for doctors to view patient predictions and medical history in order to assist with diagnosis and treatment decisions.
4. To reduce the time and cost associated with traditional lung cancer diagnosis methods by using an automated, computer-based approach.

Goal:

The goal of Lung Cancer Prediction System using efficient Net is to develop an accurate and efficient deep learning model that can predict the likelihood of a patient having lung cancer based on their medical records and diagnostic reports. The system aims to assist doctors and healthcare professionals in the early detection and diagnosis of lung cancer, thereby improving patient outcomes and reducing mortality rates associated with this disease. The goal is to provide a reliable and accessible tool for lung cancer prediction that can be used by medical practitioners to provide personalized treatment and care for their patients.

Need of the System:

The need for the Lung Cancer Prediction System using efficient Net can be attributed to the fact that lung cancer is a major health concern worldwide and the early detection of lung cancer can significantly improve the chances of successful treatment. With the increasing availability of medical data, it has become important to develop accurate and efficient methods for the early detection of lung cancer. The Lung Cancer Prediction System using efficient Net is designed to meet this need by utilizing deep learning techniques to accurately predict the probability of lung cancer in patients based on their medical data. This system has the potential to improve the accuracy of lung cancer diagnosis and provide a better chance for successful treatment.

CHAPTER # 2

Hardware and Software Requirements

Contents:

- Introduction
- System environment
- Software requirement
- Hardware requirements

Introduction:

In this chapter we mentioned the software and hardware requirements, which are necessary for successfully running this system. The major element in building systems is selecting compatible hardware and software. The system analyst must determine what software package is best for the **"Lung Cancer Prediction System"** and, where software is not an issue, the kind of hardware and peripherals needed for the final conversion.

System Environment:

After analysis, some resources are required to convert the abstract system into the real one.

The hardware and software selection begins with requirement analysis, followed by a request for proposal and vendor evaluation.

Software and real system are identified. According to the provided functional specification all the technologies and its capacities are identified. Basic functions and procedures and methodologies are prepared to implement. Some of the Basic requirements such as hardware and software are described as follows: -

Hardware and Software Specification

Software Requirements:

- Technology: Python Django
- IDE: PyCharm/Atom
- Client-Side Technologies: HTML, CSS, JavaScript, Bootstrap
- Server-Side Technologies: Python
- Data Base Server: SQLite
- Operating System: Microsoft Windows/Linux

Hardware Requirements:

- Processor: Pentium-III (or) Higher
- Ram: 64MB (or) Higher
- Hard disk: 80GB (or) Higher

CHAPTER # 3

System Analysis

Contents:

- Purpose
- Project Scope
- Existing System
- Proposed System
- System Overview

Purpose:

The purpose of the Lung Cancer Prediction System using efficient Net is to provide a reliable and efficient system for predicting the possibility of lung cancer in patients using deep learning techniques. The system aims to assist doctors and healthcare professionals in making more accurate diagnoses, leading to earlier detection and treatment of lung cancer, which can significantly increase the chances of successful treatment outcomes. The system also aims to provide a user-friendly interface for patients to access their predicted results and past predictions. Overall, the purpose of this system is to improve the accuracy and speed of lung cancer diagnosis and treatment.

Project Scope:

The scope of Lung Cancer Prediction System using efficient Net is significant as it can be used by healthcare professionals, researchers, and organizations in the field of cancer diagnosis and treatment. The system can assist doctors in making accurate predictions and diagnosis of lung cancer, which can ultimately lead to better treatment outcomes and improved patient care. Moreover, the system can be used to analyze large datasets of medical images to identify patterns and insights, which can be used for further research and development in the field of cancer treatment. This can lead to the development of more effective and efficient diagnostic and treatment methods, thereby contributing to the growth of the healthcare industry.

Proposed System:

The proposed system of Lung Cancer Prediction System using efficient Net is a deep learning-based predictive model that utilizes medical imaging data to accurately predict the likelihood of a patient having lung cancer. The system is built using the efficient Net architecture, which is known for its superior performance and efficiency in image classification tasks. The system takes input from CT scan images of the patient's lungs, preprocesses them, and feeds them into the efficient Net model. The output of the model is the probability of the patient having lung cancer, which can be used by medical professionals to make informed decisions regarding the patient's diagnosis and treatment plan. The system also includes a user interface, allowing users to easily input their medical imaging data and receive a prediction. Additionally, the system includes modules for doctors and administrators, allowing them to manage patient data and view predictions made by the model.

System Overview:

Lung Cancer Prediction System divided in three main modules:

1. Admin module
2. User module
3. Doctor module

Admin Module details

1. **Login**: The admin will have a unique username and password to access the admin panel.
2. **Dashboard**: This module will allow the admin to view the total number of users registered, total predictions made, and other related statistics.
3. **View Prediction Results**: The admin can view the predictions made by the users along with their details and prediction results.
4. **View Registered Users**: The admin can view the list of registered users along with their details.
5. **View Registered Doctors**: The admin can view the list of registered doctors along with their details.
6. **Change Password**: The admin can change their password using this module.
7. **Logout**: The admin can log out of the admin panel using this module.

User Module

- **Signup**: A user can create a new account by providing basic details like name, email, and password.
- **Login**: The users can log in to their account using the registered email and password.
- **Prediction**: The users can upload their chest X-ray image and get the prediction result if the X-ray shows any indication of lung cancer or not.
- **View Prediction History**: The users can view their past prediction results in their profile.
- **View Doctors**: Based on the user's area/city, the system recommends doctors who specialize in treating lung cancer. This is done after the prediction; in case the system detects lung cancer in the user's chest X-ray.
- **Edit Profile**: Users can update their profile information like name, email, and contact details.
- **Change Password**: Users can change their login password for security purposes.
- **Logout**: Users can log out of the system once they have finished their session.

Doctor Module

1. **Login**: Allows the doctor to log in to their account using their registered credentials.
2. **Dashboard**: Provides an overview of the doctor's account, including the total number of patients they have treated, the number of patients they have diagnosed with cancer, and the number of patients they have referred to a specialist.
3. **Patient History**: Allows the doctor to view the complete medical history of each patient they have treated. This includes previous diagnoses, lab results, and radiology reports.
4. **Profile Management**: Allows the doctor to manage their account details, including personal information, contact details, and login credentials.
5. **Logout**: Enables the doctor to log out of their account and end their session.

CHAPTER # 4

Implementation issues

HTML -

HTML (Hypertext Markup Language) is the standard markup language used to create web pages. It is a structured language that allows developers to define the structure of content on a webpage using tags, attributes, and elements. HTML provides a way for web browsers to interpret and display content in a structured and organized manner.

CSS -

CSS (Cascading Style Sheets) is a style sheet language used for describing the presentation of a document written in HTML. It enables developers to separate the structure of a webpage from its presentation. CSS allows developers to define the visual appearance of a webpage, such as font styles, colors, and layout.

JavaScript -

JavaScript is a high-level, interpreted programming language used to create interactive web pages. It is a client-side scripting language that allows developers to add dynamic elements and behavior to web pages. JavaScript can manipulate HTML and CSS in real-time, making web pages more responsive and engaging.

Bootstrap -

Bootstrap is a free and open-source CSS framework that is widely used to create responsive and mobile-first web pages. It provides pre-built CSS styles and JavaScript plugins that developers can use to create professional-looking web pages quickly and easily. Bootstrap is compatible with all modern web browsers and devices.

Python -

Python is a high-level, general-purpose programming language used to create a wide range of applications. It is a popular language for web development, scientific computing, data analysis, artificial intelligence, and many other areas. Python is known for its simplicity, readability, and easy-to-learn syntax.

Django -

Django is a free and open-source web framework written in Python. It follows the model-view-controller (MVC) architectural pattern and is designed to help developers build web applications quickly and easily. Django provides a few built-in features, such as an object-relational mapper (ORM), automatic admin interface, and URL routing, that simplify web application development.

SQLite -

SQLite is a lightweight, serverless, and self-contained relational database management system. It is widely used in web applications and mobile apps, as it requires minimal configuration and administration. SQLite is compatible with all major programming languages and provides a simple and efficient way to store and retrieve data.

Efficient Net

Efficient Net is a highly efficient deep learning architecture designed for computer vision tasks, including medical image analysis. It optimizes both accuracy and computational efficiency by scaling the model's depth, width, and resolution. In the context of a lung cancer prediction system, Efficient Net can analyze medical images such as chest X-rays or CT scans to accurately predict cancerous or non-cancerous conditions. Its efficiency and effectiveness contribute to improved diagnostic accuracy and potentially earlier detection of lung cancer.

CHAPTER # 5

System Design

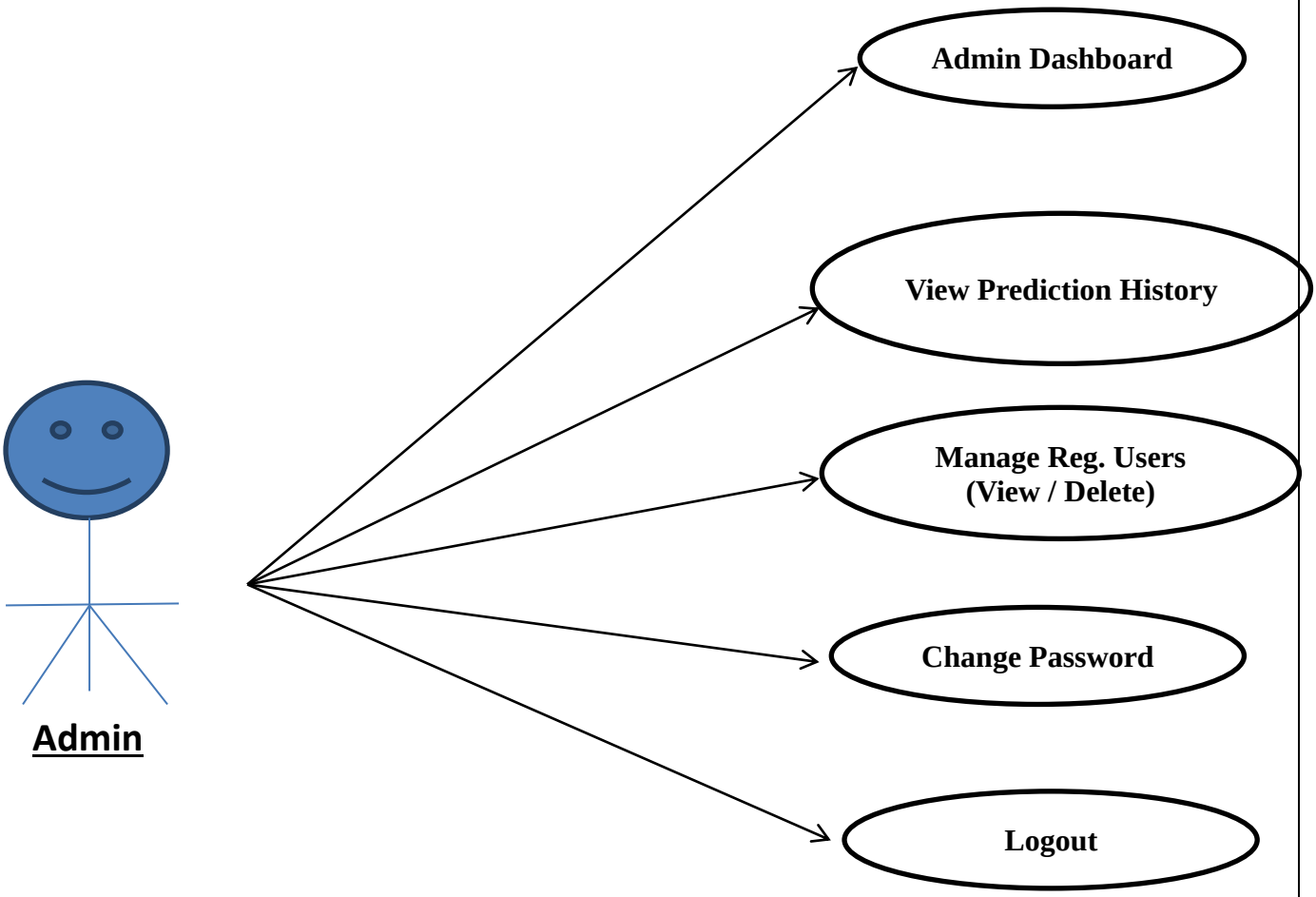
Contents:

- Use case diagram
- Class Diagram
- Sequence Diagram
- Data flow diagram

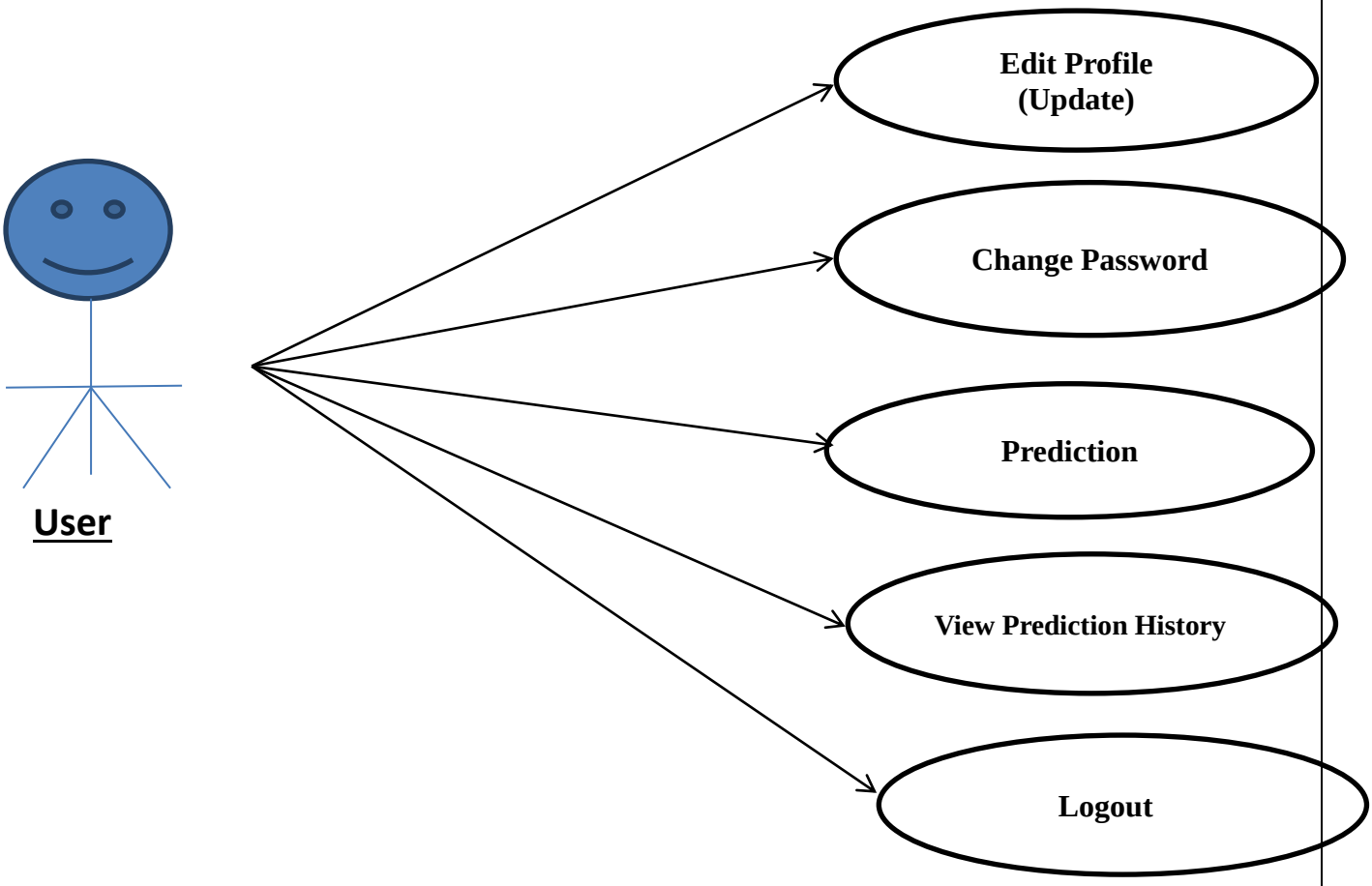
Use Case Diagram:

- Use case diagram consists of use cases and actors and shows the interaction between them. The key points are:
- The main purpose is to show the interaction between the use cases and the actor.
- To represent the system requirement from user's perspective.
- The use cases are the functions that are to be performed in the module.

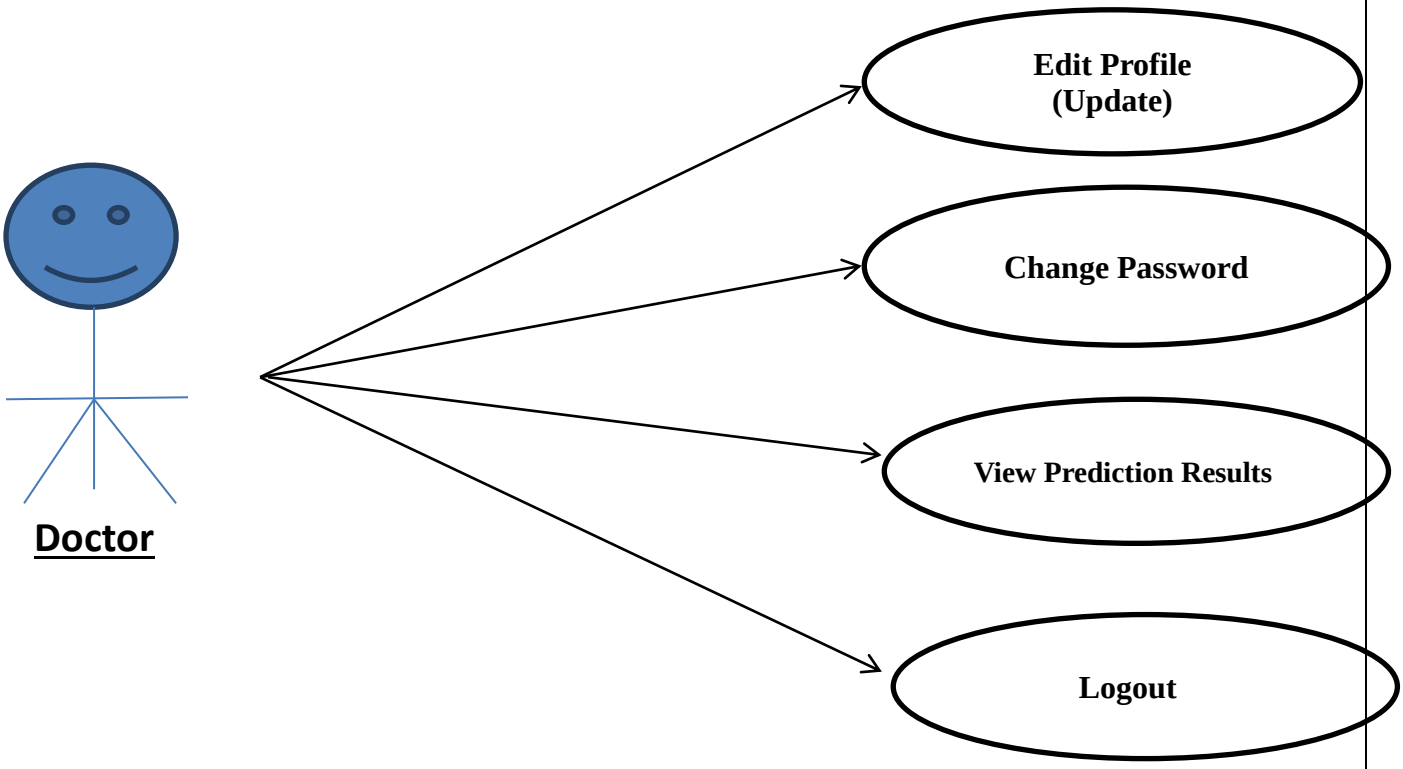
Use Case Diagram Admin



Use Case Diagram - User

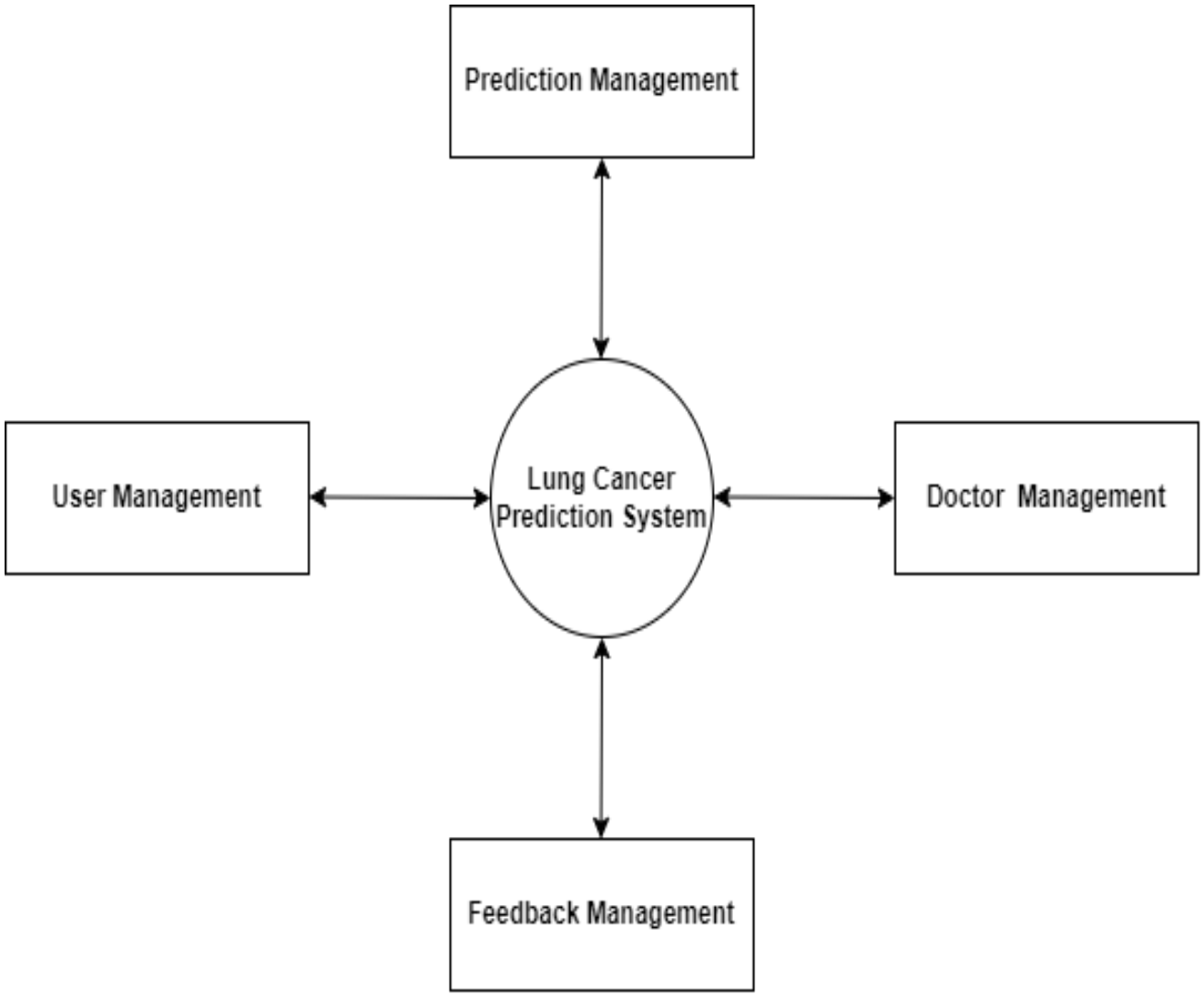


Use Case Diagram - Doctor



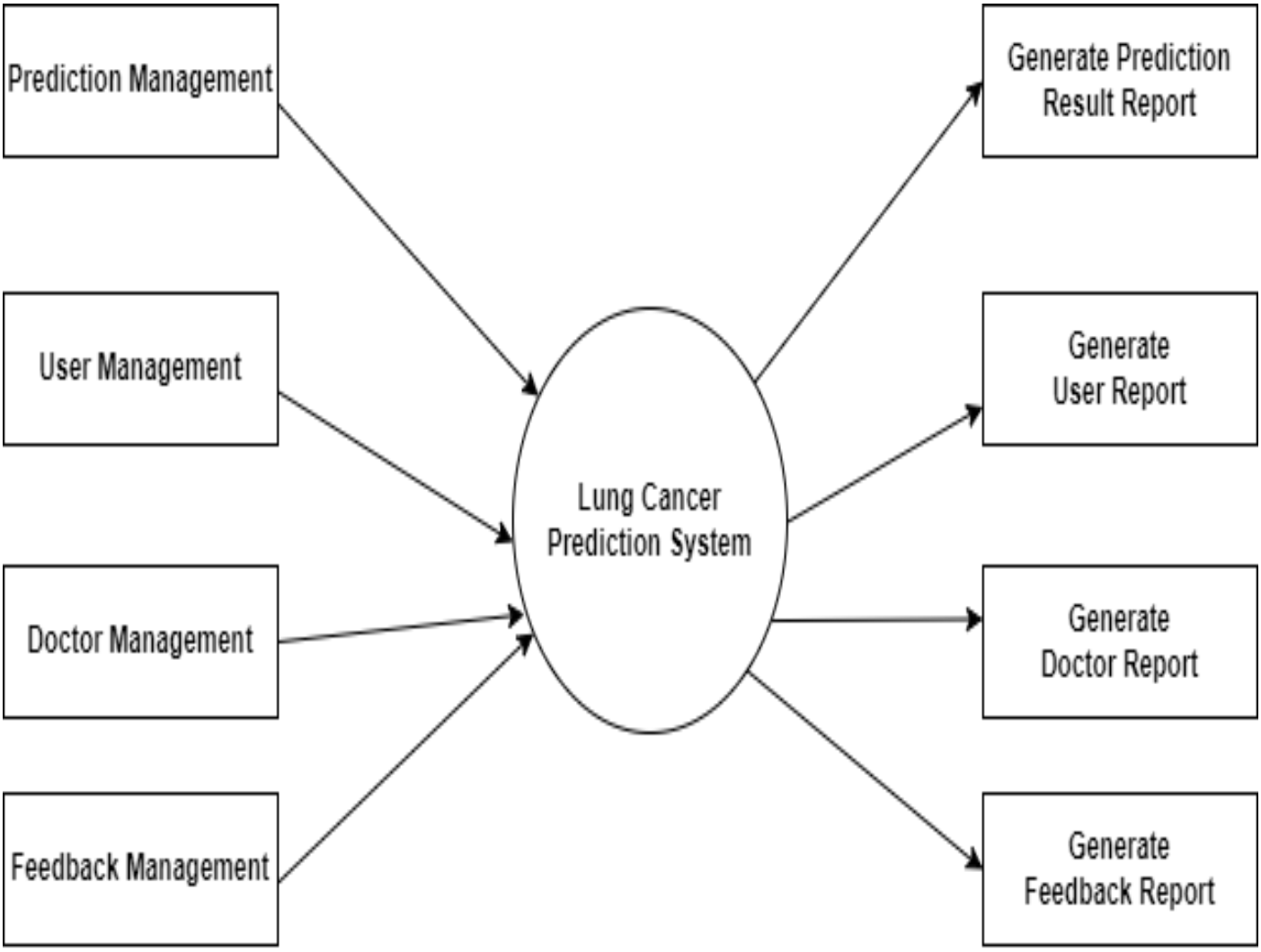
DFD (Data Flow Diagram)

DFD Level 0



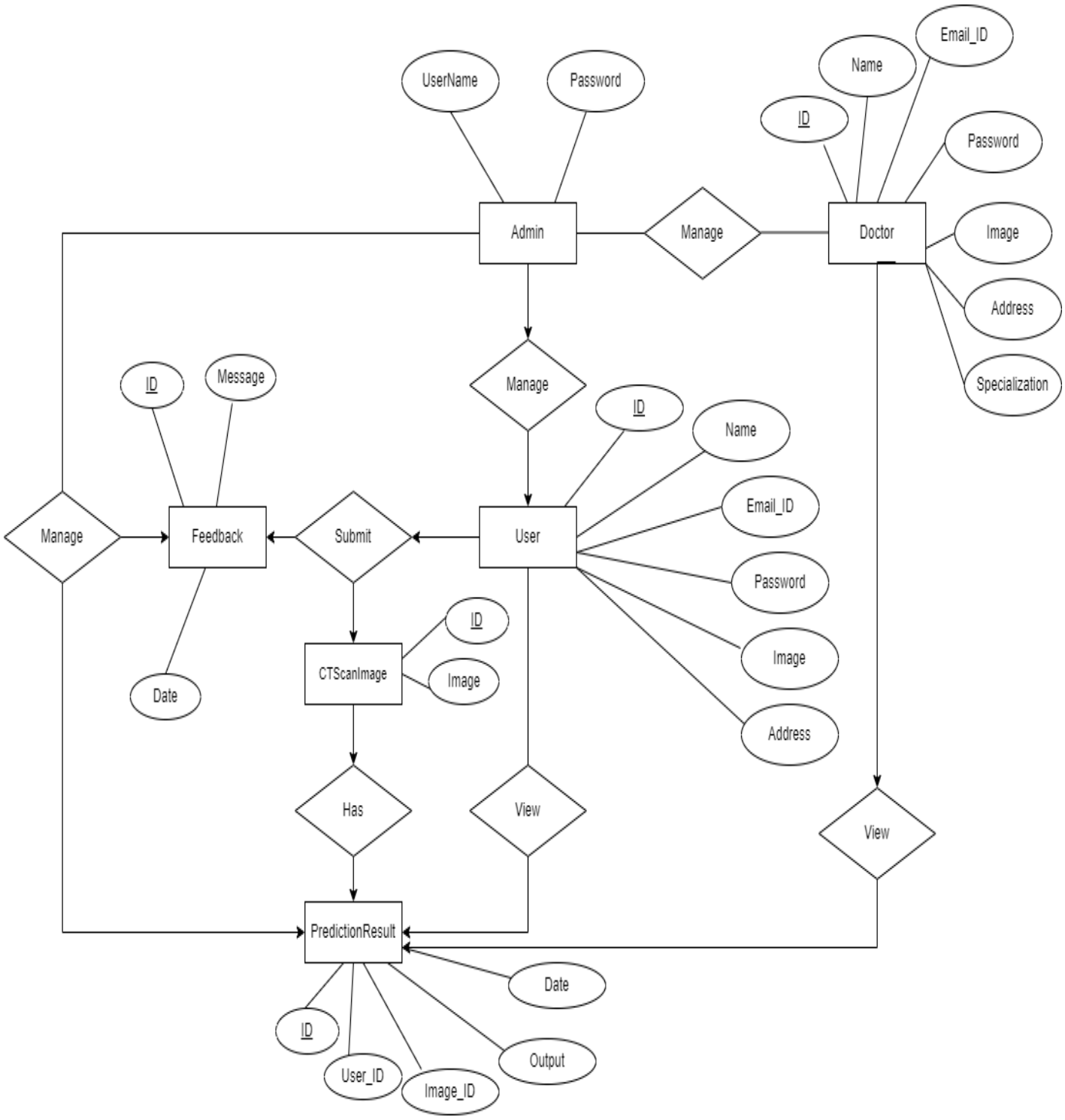
Zero Level DFD - Lung Cancer Prediction System

DFD Level 1



First Level DFD - Lung Cancer Prediction System

ER DIAGRAM


UserName
Password
Admin
Manage
Email_ID
Name
ID
Password
Doctor
Image
Address
Specialization
ID
Message
Manage
ID
Name
Email_ID
Password
Image
Address
Manage
Feedback
Submit
User
ID
Image
CTScanImage
Date
Has
View
View
PredictionResult
Date
ID
User_ID
Image_ID
Output

Sequence Diagram for Administrator: -

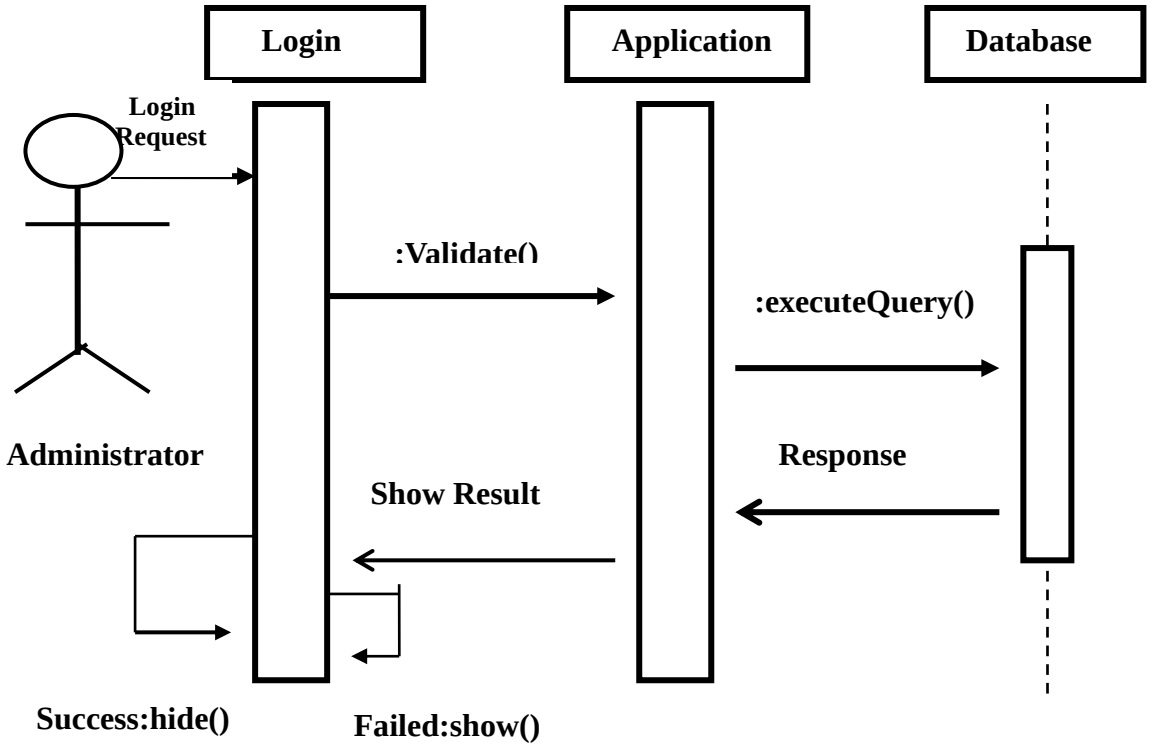
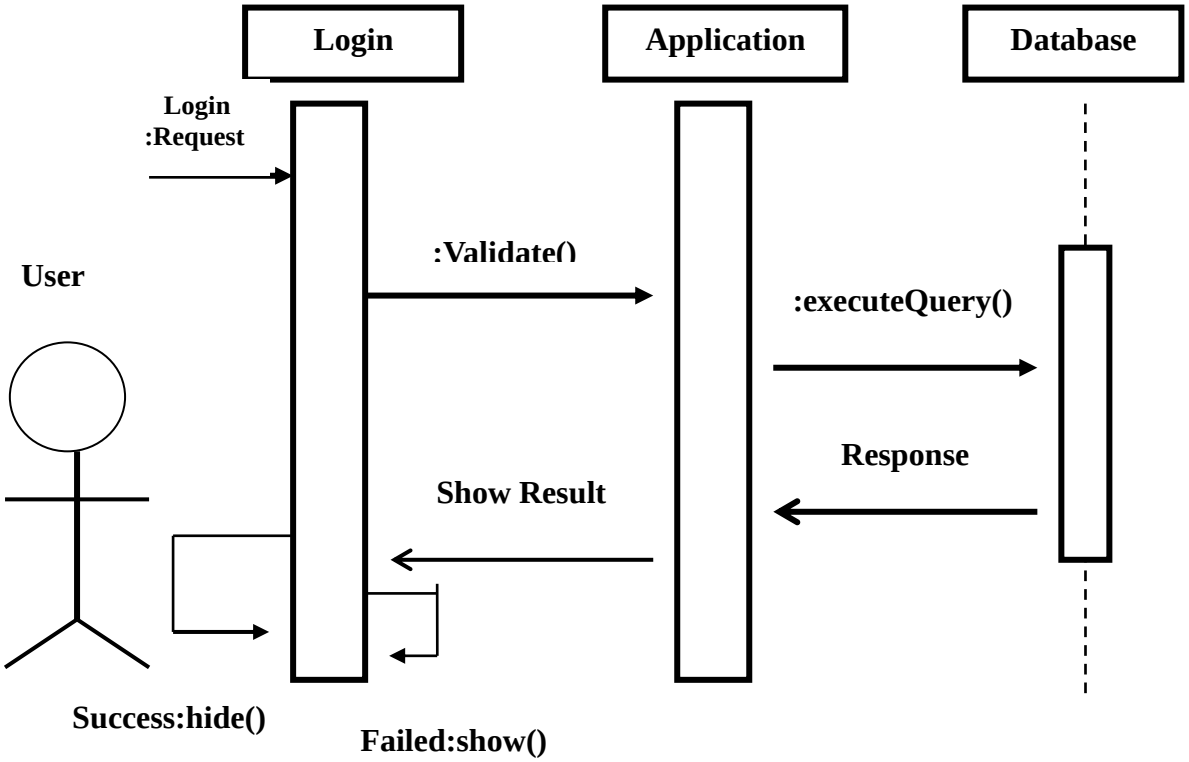


Fig.5.4

Sequence Diagram For User: -



:

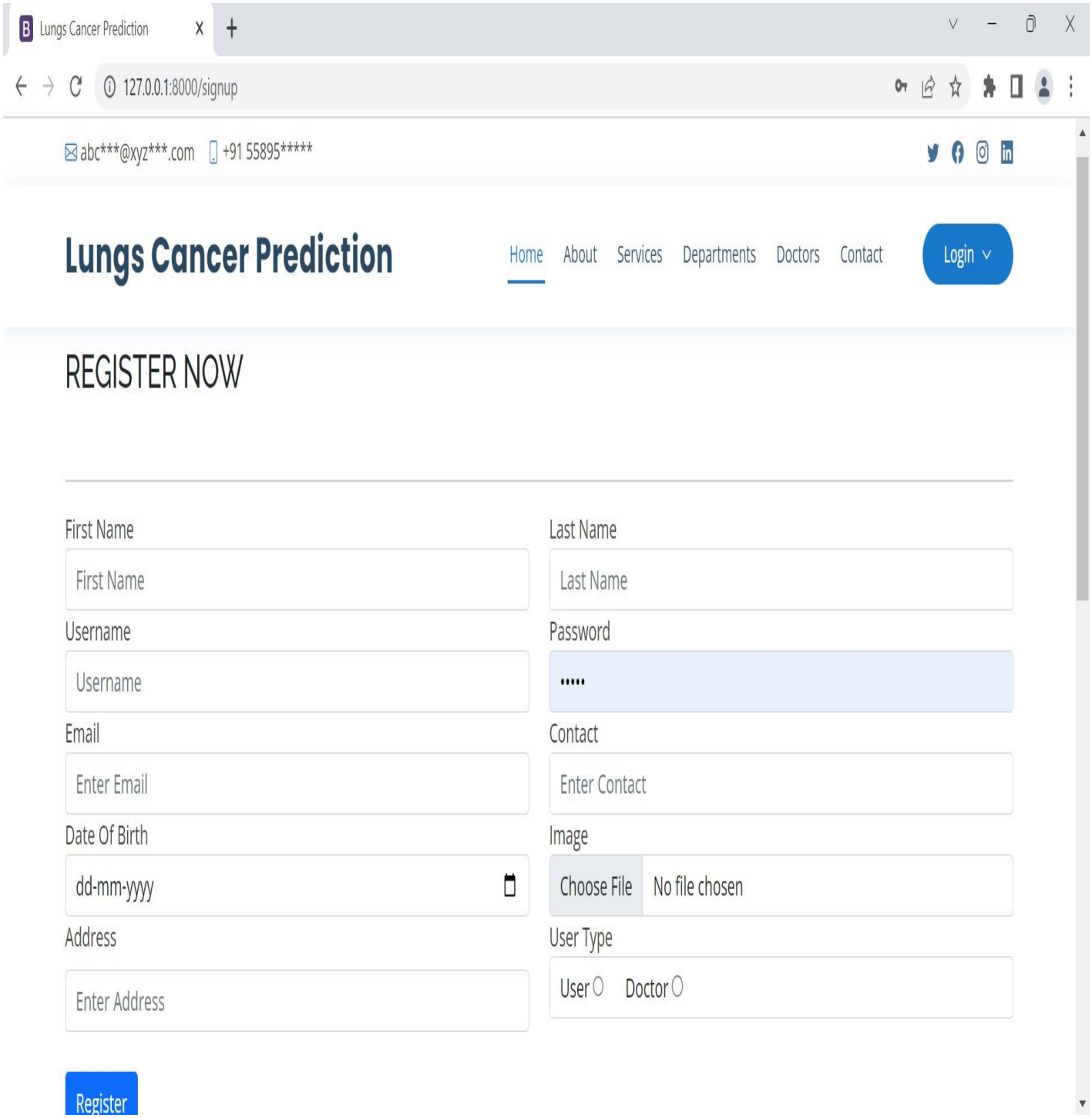
Fig.5.5

CHAPTER # 6

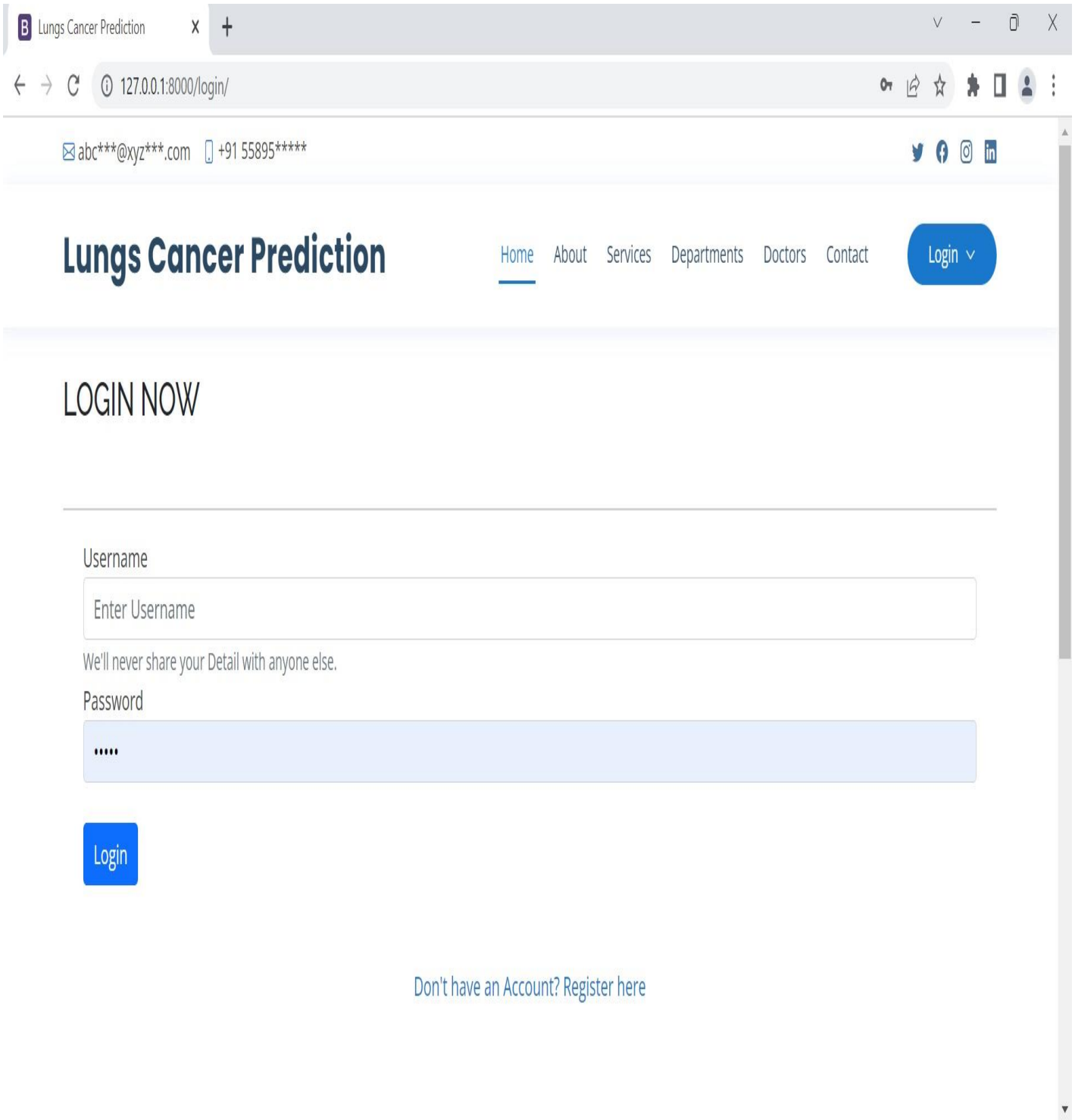
Output screens

HOME PAGE

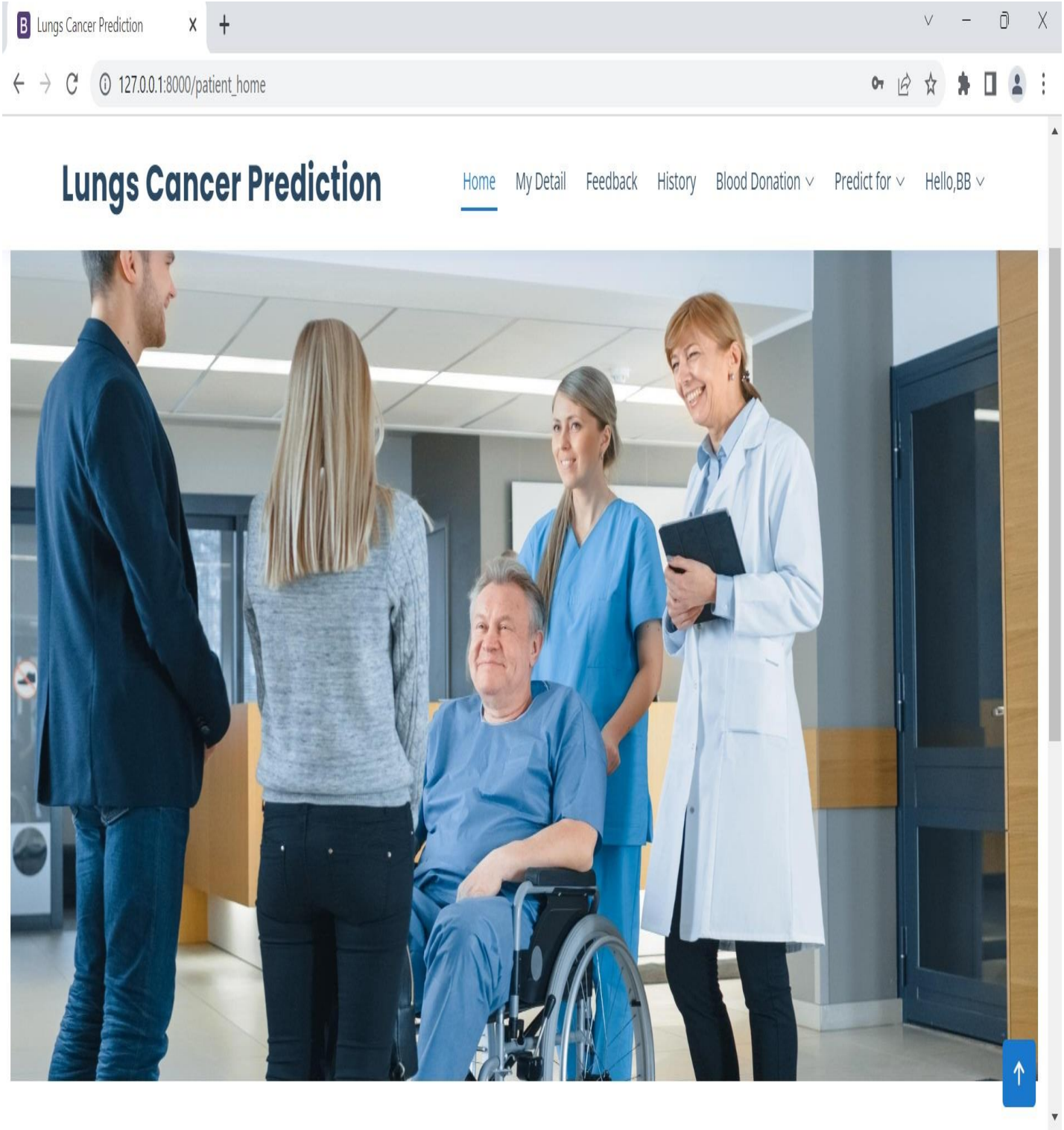
USER REGISTRATION PAGE



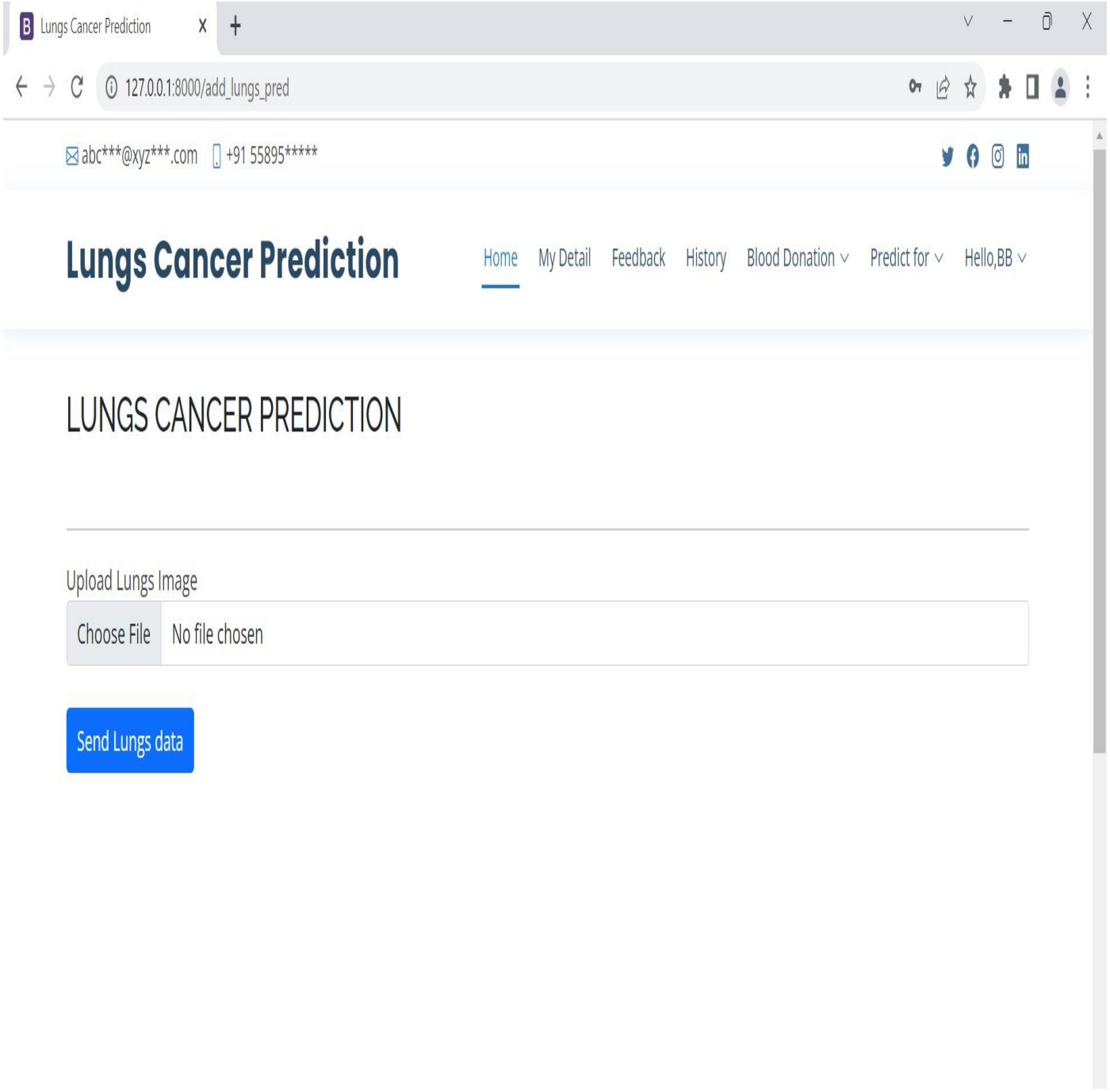
USER LOGIN PAGE



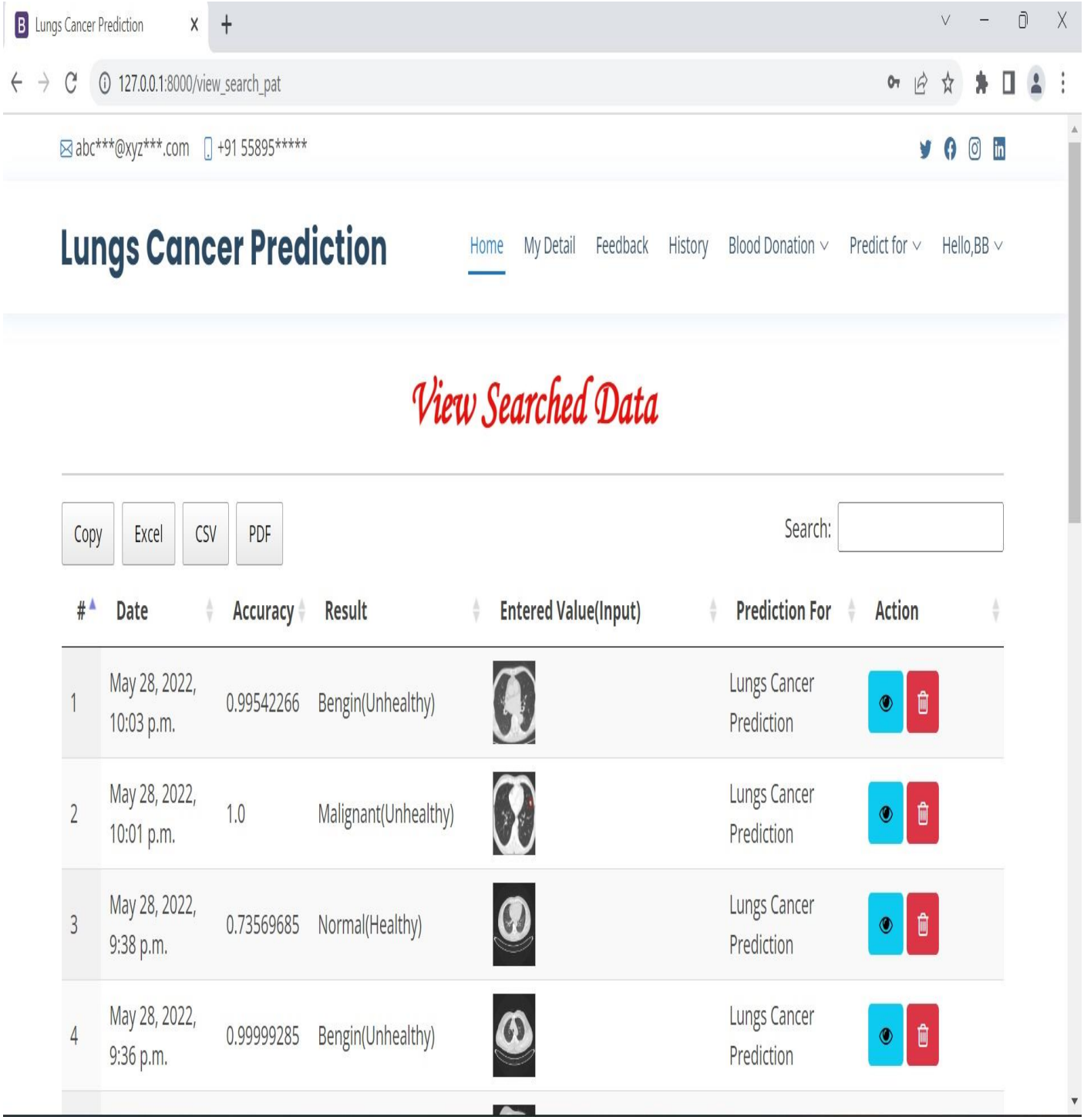
USER HOME PAGE



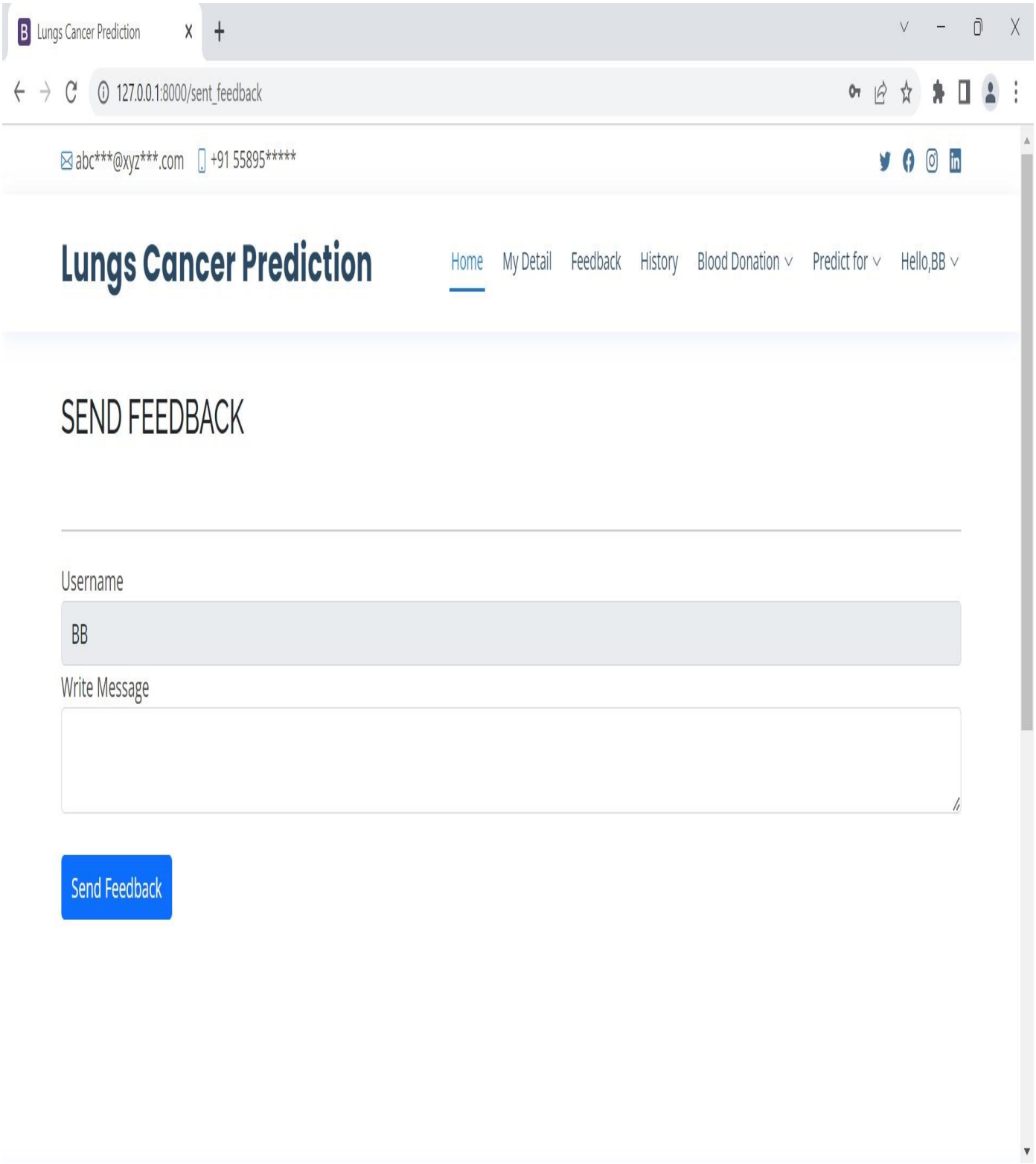
PREDICTION PAGE



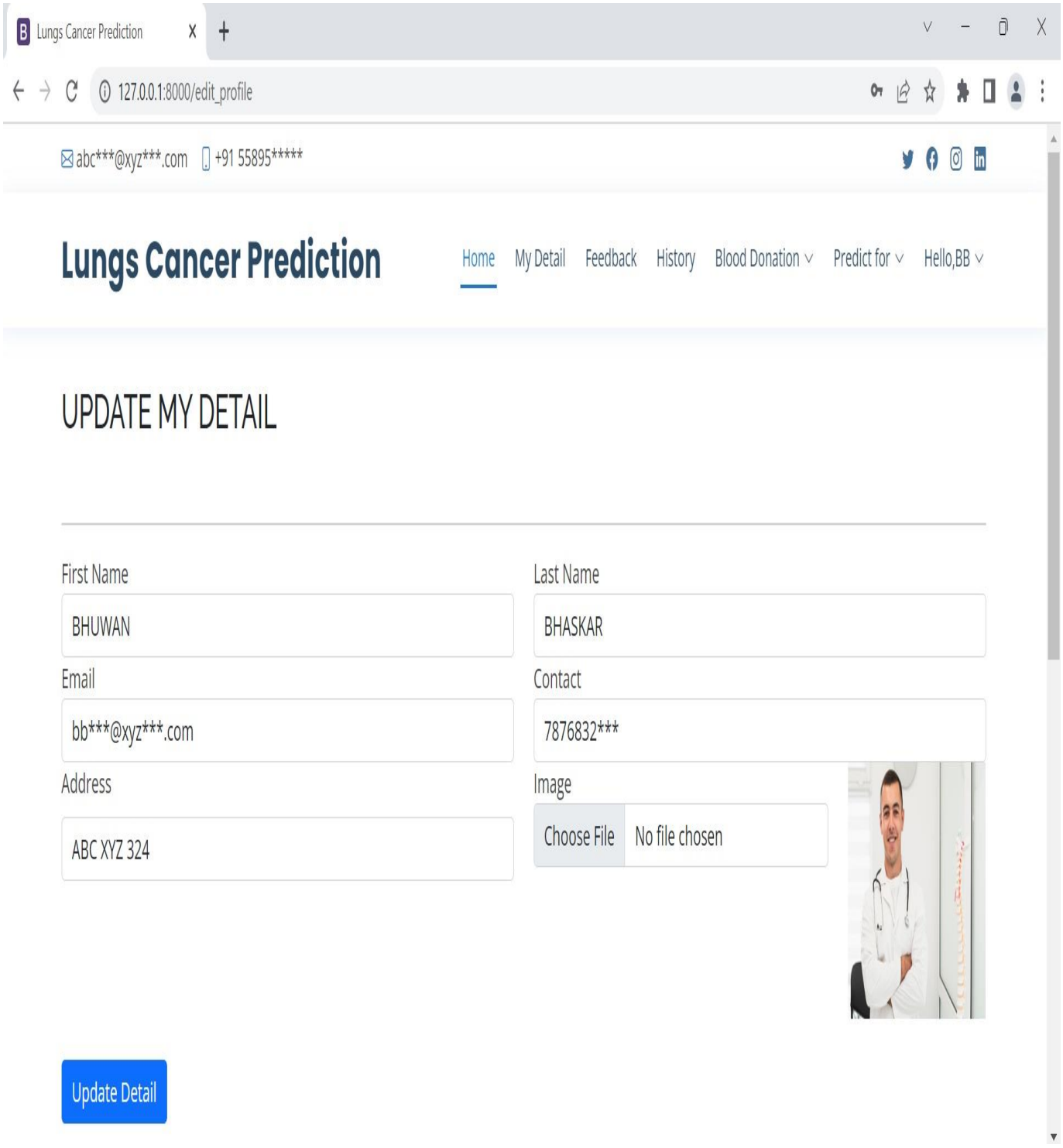
VIEW PREDICTION RESULT HISTORY PAGE



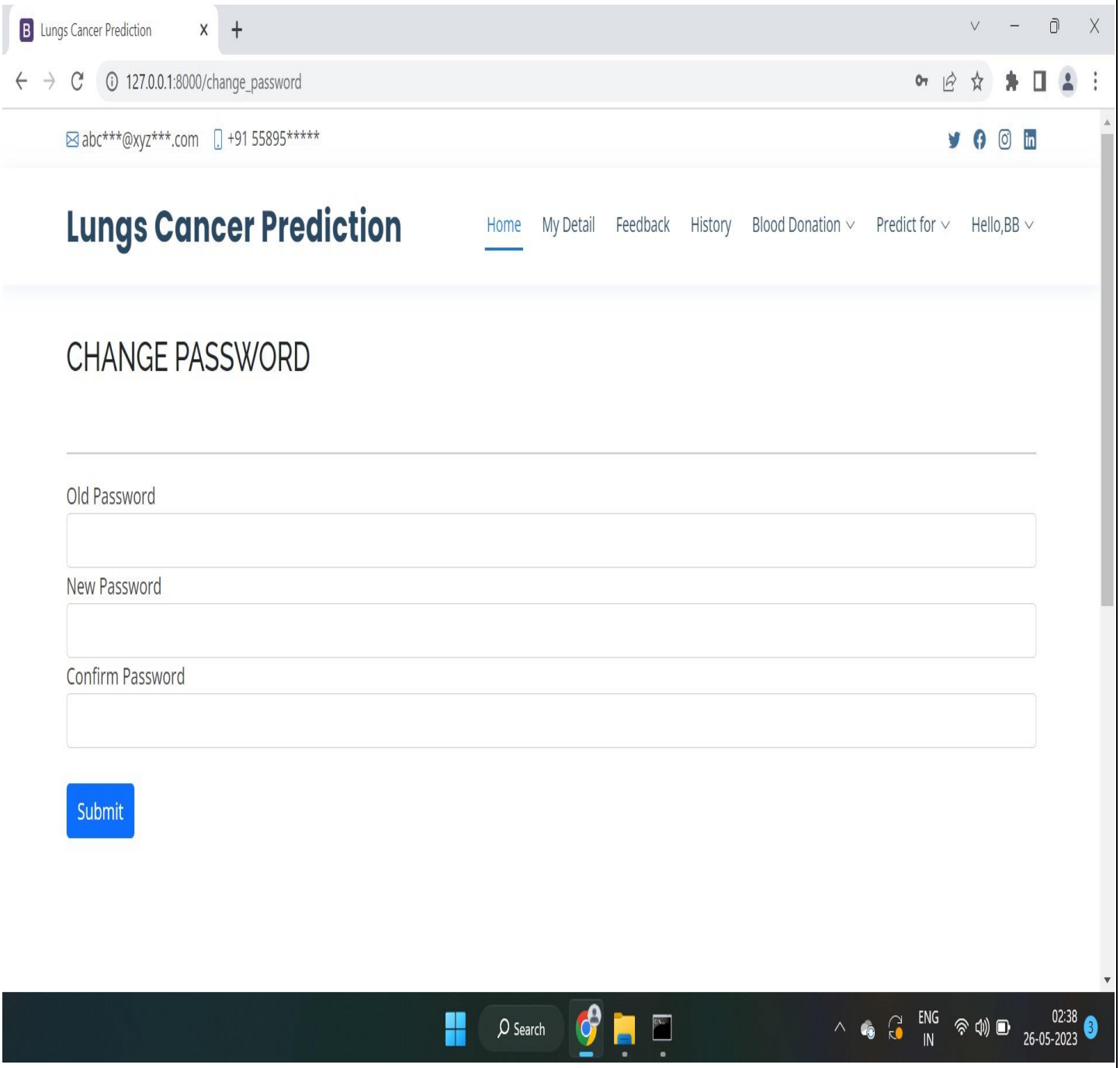
SEND FEEDBACK PAGE



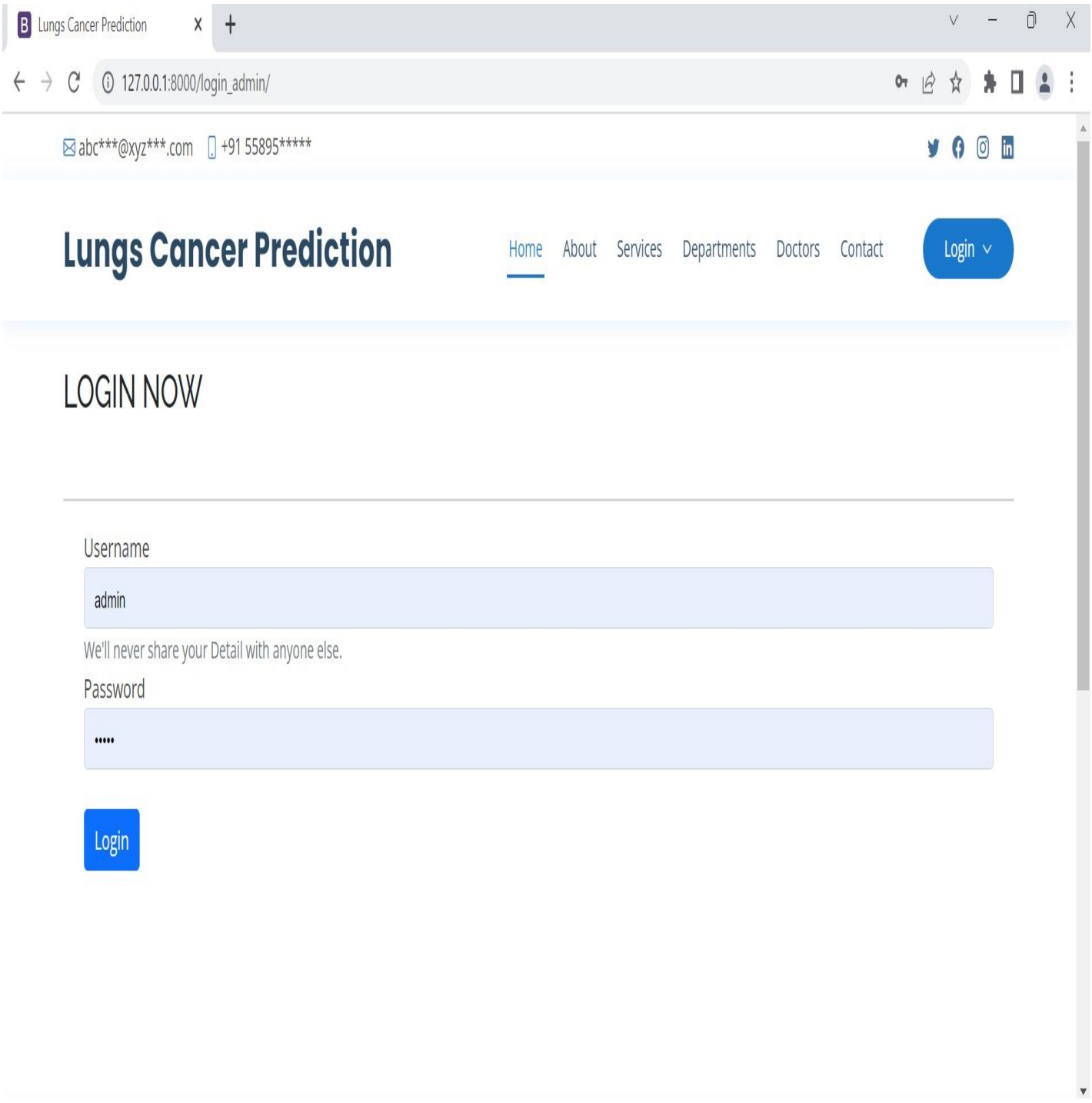
EDIT PROFILE PAGE



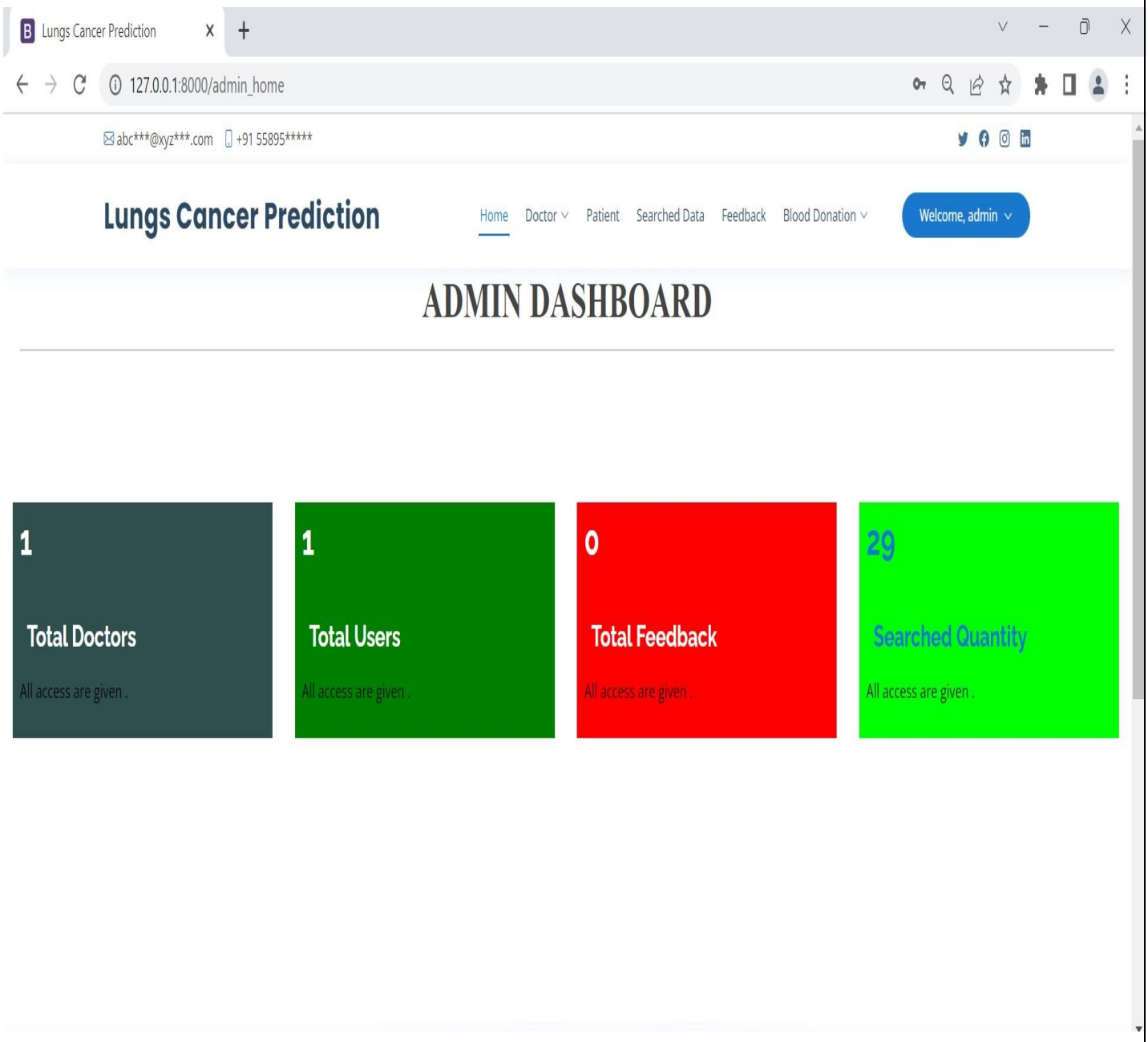
CHANGE PASSWORD PAGE



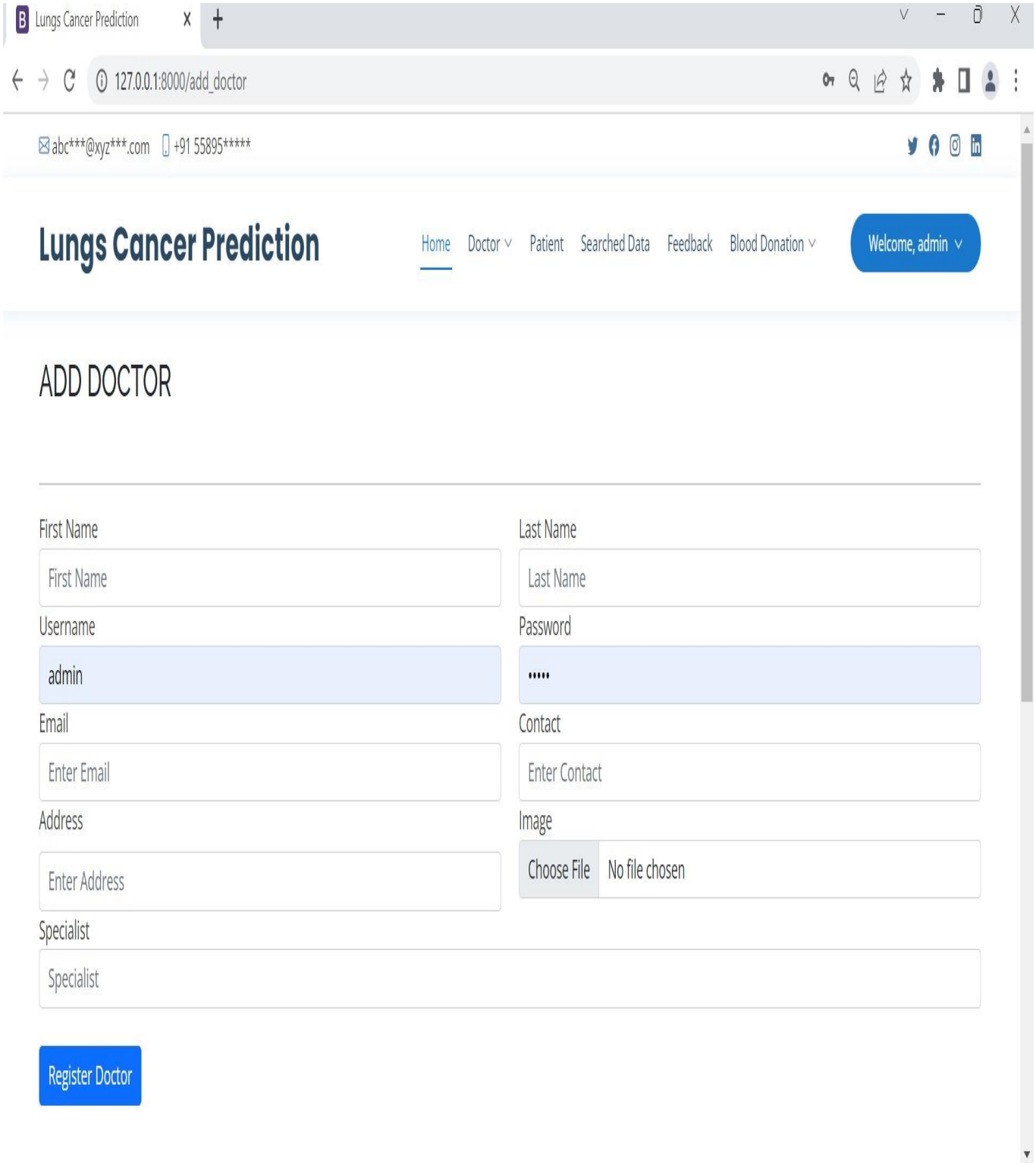
ADMIN LOGIN PAGE



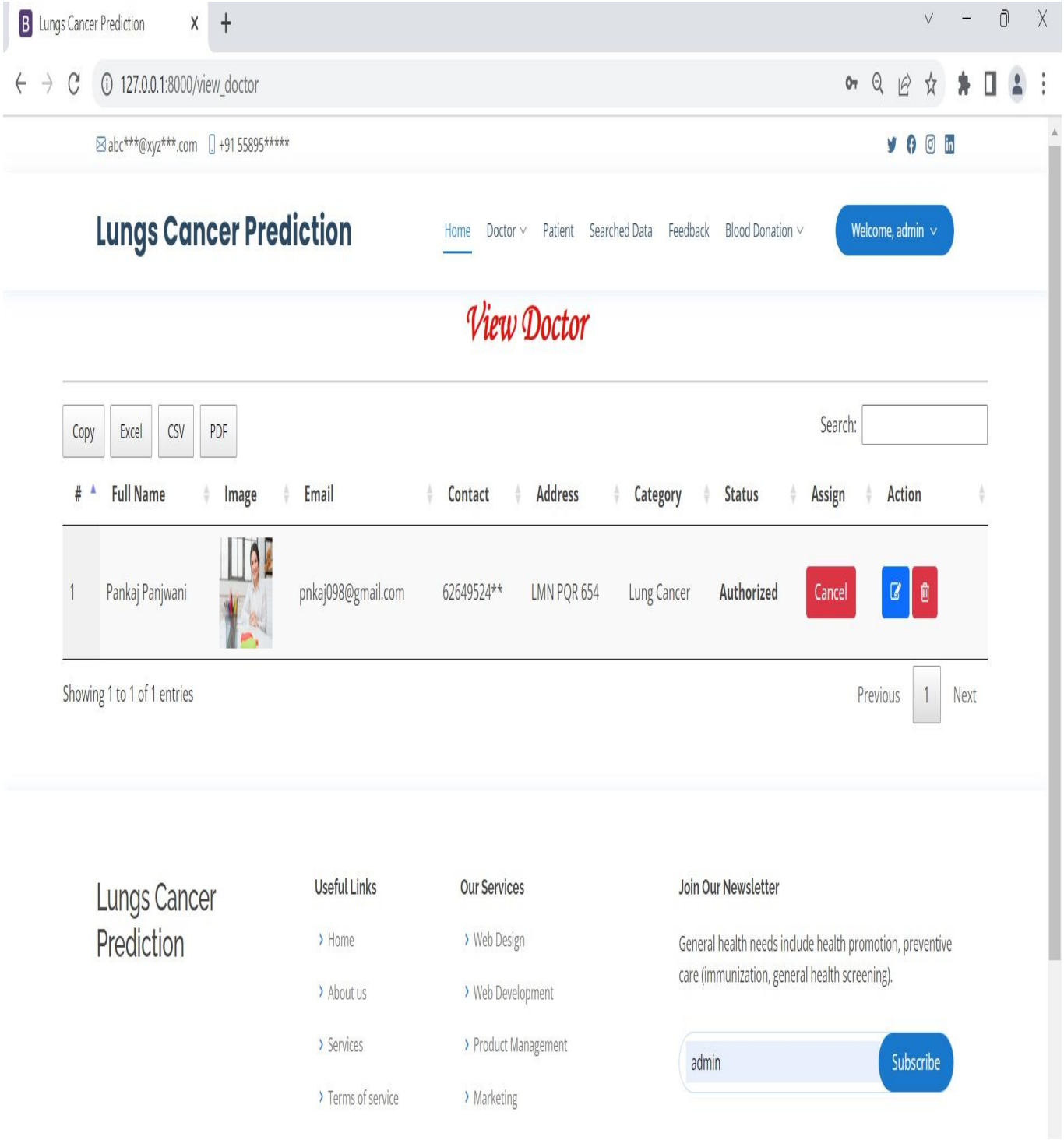
ADMIN HOME PAGE



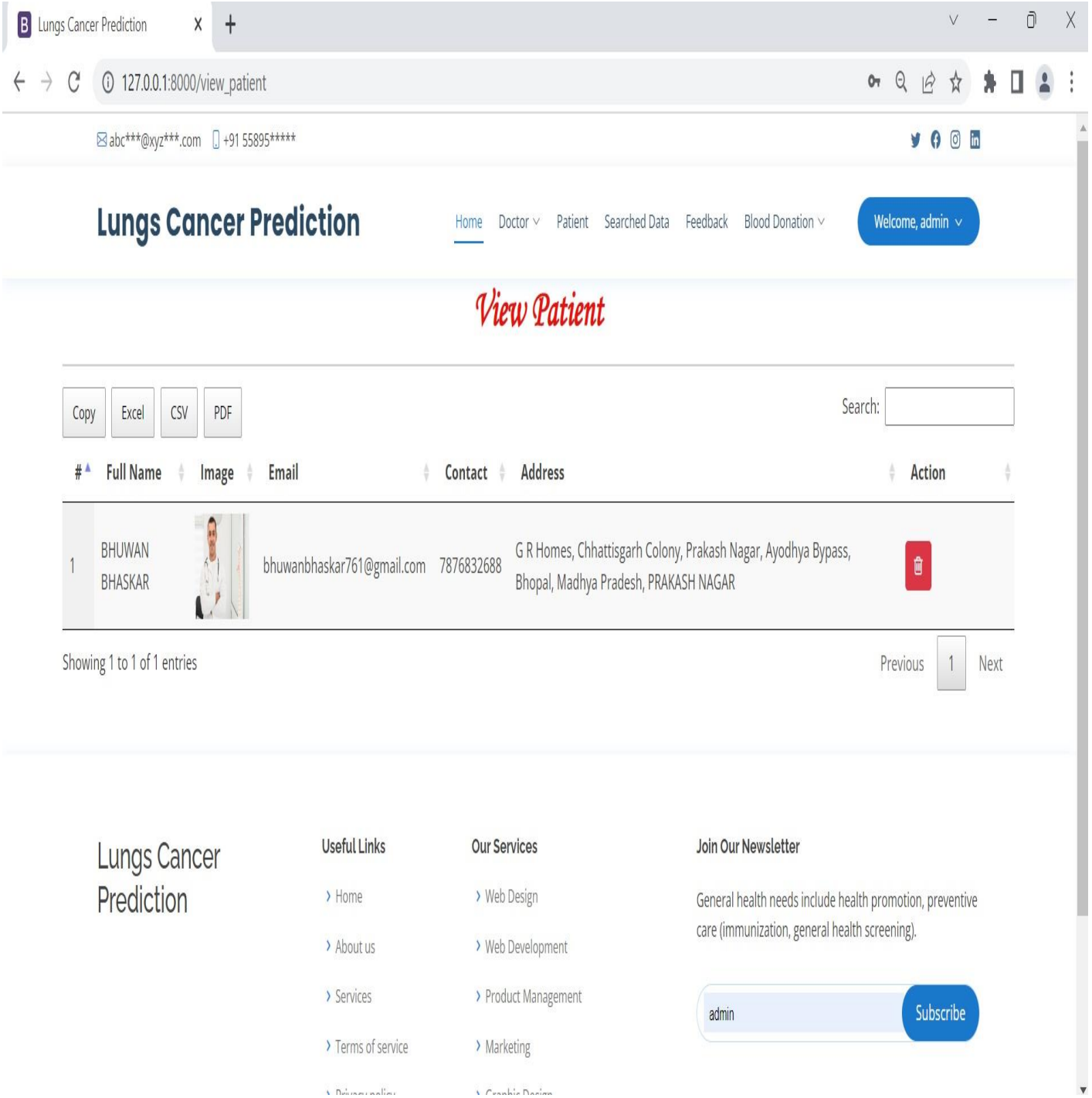
ADD DOCTOR PAGE



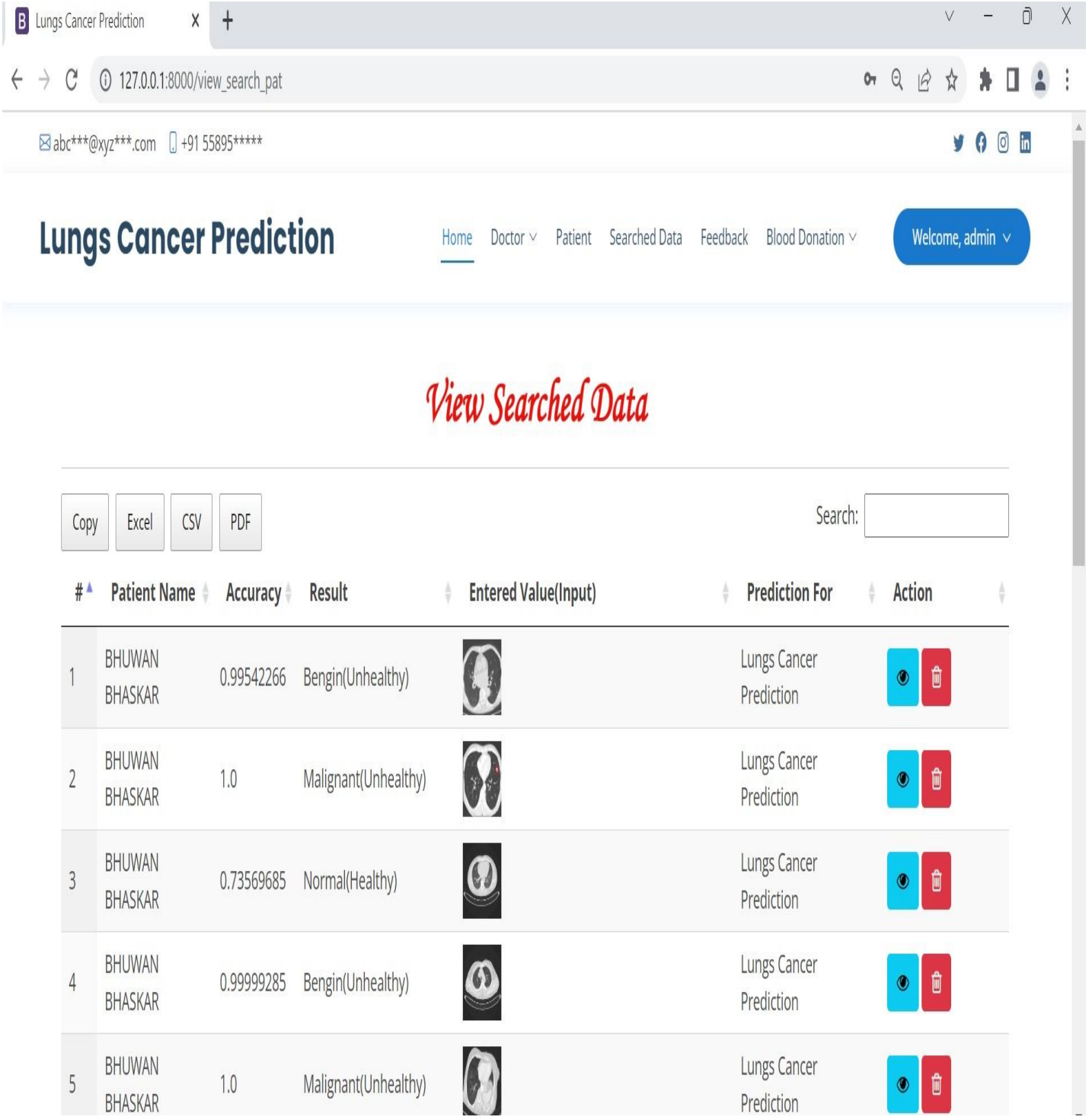
MANAGE DOCTOR PAGE



VIEW ALL USERS PAGE



VIEW ALL PREDICTION RESULT HISTORY PAGE



CHAPTER # 7

Coding

HOME PAGE CODING

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  <meta content="width=device-width, initial-scale=1.0" name="viewport">

  <title>Lungs Cancer Prediction</title>
  <meta content="" name="description">
  <meta content="" name="keywords">

  <!-- Favicons -->
  <link href="{% static 'img/favicon.png' %}" rel="icon">
  <link href="{% static 'img/apple-touch-icon.png' %}" rel="apple-touch-icon">

  <!-- Google Fonts -->
  <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600i,7
00,700i|Raleway:300,300i,400,400i,500,500i,600,600i,700,700i|Poppins:300,300i,400,400i,
500,500i,600,600i,700,700i" rel="stylesheet">
```

```
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  <link href="{% static 'vendor/glightbox/css/glightbox.min.css' %}" rel="stylesheet">
  <link href="{% static 'vendor/remixicon/remixicon.css' %}" rel="stylesheet">
  <link href="{% static 'vendor/swiper/swiper-bundle.min.css' %}" rel="stylesheet">

  <!-- Template Main CSS File -->
  <link href="{% static 'css/style.css' %}" rel="stylesheet">
  <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-awesome.min.css">

  <!-- =======================================================
  * Template Name: Medilab - v4.7.1
  * Template URL: https://bootstrapmade.com/medilab-free-medical-bootstrap-theme/
  * Author: BootstrapMade.com
  * License: https://bootstrapmade.com/license/
  ======================================================= -->
  <link rel='stylesheet' type='text/css' href="https://cdn.datatables.net/1.10.21/css/jquery.dataTables.min.css">
  <link rel='stylesheet' type='text/css' href="https://cdn.datatables.net/buttons/1.6.2/css/buttons.dataTables.min.css">

  <script src="https://code.jquery.com/jquery-3.5.1.js"></script>
  <script src="https://cdn.datatables.net/1.10.21/js/jquery.dataTables.min.js"></script>
  <script src="https://cdn.datatables.net/buttons/1.6.2/js/dataTables.buttons.min.js"></script>
  <script src="https://cdnjs.cloudflare.com/ajax/libs/jszip/3.1.3/jszip.min.js"></script>
  <script src="https://cdnjs.cloudflare.com/ajax/libs/pdfmake/0.1.53/pdfmake.min.js"></script>
```

```
  <script
src="https://cdnjs.cloudflare.com/ajax/libs/pdfmake/0.1.53/vfs_fonts.js"></script>
  <script
src="https://cdn.datatables.net/buttons/1.6.2/js/buttons.html5.min.js"></script>

  <script>
  $(document).ready(function() {
     $('#example').DataTable( {
        dom: 'Bfrtip',
        buttons: [
           'copyHtml5',
           'excelHtml5',
           'csvHtml5',
           'pdfHtml5'
        ]
     } );
  } );
  </script>


</head>

<body>

  <!-- ======= Top Bar ======= -->
  <div id="topbar" class="d-flex align-items-center fixed-top">
    <div class="container d-flex justify-content-between">
      <div class="contact-info d-flex align-items-center">
        <i                  class="bi                  bi-envelope"></i>                  <a
href="mailto:contact@example.com">contact@example.com</a>
        <i class="bi bi-phone"></i> +1 5589 55488 55
      </div>
      <div class="d-none d-lg-flex social-links align-items-center">
        <a href="#" class="twitter"><i class="bi bi-twitter"></i></a>
```

```
      <a href="#" class="facebook"><i class="bi bi-facebook"></i></a>
      <a href="#" class="instagram"><i class="bi bi-instagram"></i></a>
      <a href="#" class="linkedin"><i class="bi bi-linkedin"></i></i></a>
    </div>
  </div>
 </div>

 <!-- ======= Header ======= -->
 <header id="header" class="fixed-top">
  <div class="container d-flex align-items-center">

    <h1 class="logo me-auto"><a href="index.html">Lungs Cancer Prediction</a></h1>

    {% if request.user.is_staff %}
    <nav id="navbar" class="navbar order-last order-lg-0">
      <ul>
       <li><a class="nav-link scrollto active" href="{% url 'admin_home' %}">Home</a></li>
       <li class="dropdown"><a href="#"><span>Doctor</span> <i class="bi bi-chevron-down"></i></a>
         <ul>
          <li><a href="/add_doctor">Add Doctor</a></li>
          <li><a href="/view_doctor">View Doctor</a></li>

         </ul>
       </li>
       <li><a class="nav-link scrollto" href="/view_patient">Patient</a></li>
       <li><a class="nav-link scrollto" href="/view_search_pat">Searched Data</a></li>
       <li><a class="nav-link scrollto" href="/view_feedback">Feedback</a></li>

       <li class="dropdown"><a href="#"><span>Blood Donation</span> <i class="bi bi-chevron-down"></i></a>
```

```
          <ul>
            <li><a href="/request_blood">Request for Blood</a></li>
            <li><a href="/donator_blood">Donate for Blood</a></li>
          </ul>
        </li>

        <li class="dropdown">

          <a href="#" class="appointment-btn scrollto" style="color: #fff;"><span class="d-none d-md-inline">Welcome,</span> {{request.user.username}} <i class="bi bi-chevron-down"></i></a>
          <ul>
            <li><a href="{% url 'change_password' %}">Password</a></li>
            <li><a href="{% url 'logout' %}">Logout</a></li>

          </ul>
        </li>
      </ul>
      <i class="bi bi-list mobile-nav-toggle"></i>
    </nav>
    {% elif request.user.patient_set.all.0 %}
    <nav id="navbar" class="navbar order-last order-lg-0">
      <ul>
        <li><a class="nav-link scrollto active" href="{% url 'patient_home' %}">Home</a></li>
        <li><a class="nav-link scrollto" href="/profile_doctor">My Detail</a></li>
        <li><a class="nav-link scrollto" href="/sent_feedback">Feedback</a></li>
        <li><a class="nav-link scrollto" href="/view_search_pat">History</a></li>

        <li class="dropdown"><a href="#"><span>Blood Donation</span> <i class="bi bi-chevron-down"></i></a>
          <ul>
            <li><a href="/search_blood">Search Blood</a></li>
            <li><a href="/donate_blood">Donate Blood</a></li>
```

```
          </ul>
        </li>

        <li class="dropdown"><a href="#"><span>Predict for</span> <i class="bi bi-chevron-down"></i></a>
          <ul>

            <li><a href="/add_lungs_pred">Lungs Cancer</a></li>
            <li><a href="/add_heartdetail">Heart Prediction</a></li>
            <li><a href="/add_genralhealth">General Health</a></li>

          </ul>
        </li>

        <li class="dropdown"><a href="#"><span>Hello,{{request.user.username}}</span> <i class="bi bi-chevron-down"></i></a>
          <ul>

            <li><a href="{% url 'change_password' %}">Password</a></li>
            <li><a href="{% url 'logout' %}">Logout</a></li>

          </ul>
        </li>
      </ul>
      <i class="bi bi-list mobile-nav-toggle"></i>
    </nav>
    {% elif request.user.doctor_set.all.0 %}

    <nav id="navbar" class="navbar order-last order-lg-0">
      <ul>
        <li><a class="nav-link scrollto active" href="{% url 'doctor_home' %}">Home</a></li>
        <li><a class="nav-link scrollto" href="/profile_doctor">My Detail</a></li>
```

```
        <li><a class="nav-link scrollto" href="/view_search_pat">Searched Data</a></li>
        <li><a class="nav-link scrollto" href="{% url 'change_password' %}">Password</a></li>
        <li><a class="nav-link scrollto" href="{% url 'logout' %}">Logout</a></li>
        {% comment %} <li class="dropdown"><a href="#"><span>Drop Down</span> <i class="bi bi-chevron-down"></i></a>
          <ul>
            <li><a href="#">Drop Down 1</a></li>
            <li class="dropdown"><a href="#"><span>Deep Drop Down</span> <i class="bi bi-chevron-right"></i></a>
              <ul>
                <li><a href="#">Deep Drop Down 1</a></li>
                <li><a href="#">Deep Drop Down 2</a></li>
                <li><a href="#">Deep Drop Down 3</a></li>
                <li><a href="#">Deep Drop Down 4</a></li>
                <li><a href="#">Deep Drop Down 5</a></li>
              </ul>
            </li>
            <li><a href="#">Drop Down 2</a></li>
            <li><a href="#">Drop Down 3</a></li>
            <li><a href="#">Drop Down 4</a></li>
          </ul>
        </li> {% endcomment %}
        {% comment %} <li><a class="nav-link scrollto" href="#contact">Contact</a></li> {% endcomment %}
      </ul>
      <i class="bi bi-list mobile-nav-toggle"></i>
    </nav>

    {% else %}

    <nav id="navbar" class="navbar order-last order-lg-0">
      <ul>
```

```
        <li><a class="nav-link scrollto active" href="/#hero">Home</a></li>
        <li><a class="nav-link scrollto" href="/#about">About</a></li>
        <li><a class="nav-link scrollto" href="/#services">Services</a></li>
        <li><a class="nav-link scrollto" href="/#departments">Departments</a></li>
        <li><a class="nav-link scrollto" href="/#doctors">Doctors</a></li>
        {% comment %} <li class="dropdown"><a href="#"><span>Drop Down</span>
<i class="bi bi-chevron-down"></i></a>
          <ul>
            <li><a href="#">Drop Down 1</a></li>
            <li class="dropdown"><a href="#"><span>Deep Drop Down</span> <i
class="bi bi-chevron-right"></i></a>
              <ul>
                <li><a href="#">Deep Drop Down 1</a></li>
                <li><a href="#">Deep Drop Down 2</a></li>
                <li><a href="#">Deep Drop Down 3</a></li>
                <li><a href="#">Deep Drop Down 4</a></li>
                <li><a href="#">Deep Drop Down 5</a></li>
              </ul>
            </li>
            <li><a href="#">Drop Down 2</a></li>
            <li><a href="#">Drop Down 3</a></li>
            <li><a href="#">Drop Down 4</a></li>
          </ul>
        </li> {% endcomment %}
        <li><a class="nav-link scrollto" href="#contact">Contact</a></li>
      </ul>
      <i class="bi bi-list mobile-nav-toggle"></i>
    </nav>
    <nav id="navbar" class="navbar order-last order-lg-0">
      <ul>
      <li class="dropdown">

        <a href="#" class="appointment-btn scrollto" style="color: #fff;"><span
class="d-none d-md-inline">Login</span> <i class="bi bi-chevron-down"></i></a>
```

```
        <ul>
          <li><a href="{% url 'login_admin' %}">Admin Login</a></li>
          <li><a href="{% url 'login' %}">User Login</a></li>

        </ul>
      </li>
    </ul>
  </nav>
    {% endif %}

</header><!-- End Header -->

<!-- ======= Hero Section ======= -->
<div class="mt-5 mb-5" style="margin-top:14%">
{% block body %}
{% endblock %}
</div>


<footer id="footer">

  <div class="footer-top">
    <div class="container">
      <div class="row">

        <div class="col-lg-3 col-md-6 footer-contact">
          <h3>Lungs Cancer Prediction</h3>
          <p>
            YCT Academy Indrapuri <br>
            Bhopal, MadhyaPradesh 462022<br>
            India <br><br>
            <strong>Phone:</strong> +1 5589 55488 55<br>
            <strong>Email:</strong> info@example.com<br>
          </p>
```

```
        </div>

        <div class="col-lg-2 col-md-6 footer-links">
          <h4>Useful Links</h4>
          <ul>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Home</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">About us</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Services</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Terms of service</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Privacy policy</a></li>
          </ul>
        </div>

        <div class="col-lg-3 col-md-6 footer-links">
          <h4>Our Services</h4>
          <ul>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Web Design</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Web Development</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Product Management</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Marketing</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Graphic Design</a></li>
          </ul>
        </div>

        <div class="col-lg-4 col-md-6 footer-newsletter">
          <h4>Join Our Newsletter</h4>
          <p>General health needs include health promotion, preventive care (immunization, general health screening).</p>
          <form action="" method="post">
            <input type="email" name="email"><input type="submit" value="Subscribe">
```

```
          </form>
        </div>

      </div>
    </div>
  </div>

  <div class="container d-md-flex py-4">

    <div class="me-md-auto text-center text-md-start">
      <div class="copyright">
        &copy; Copyright <strong><span>General Health Prediction</span></strong>. All Rights Reserved
      </div>
      <div class="credits">
        <!-- All the links in the footer should remain intact. -->
        <!-- You can delete the links only if you purchased the pro version. -->
        <!-- Licensing information: https://bootstrapmade.com/license/ -->
        <!-- Purchase the pro version with working PHP/AJAX contact form: https://bootstrapmade.com/medilab-free-medical-bootstrap-theme/ -->

      </div>
    </div>
    <div class="social-links text-center text-md-right pt-3 pt-md-0">
      <a href="#" class="twitter"><i class="bx bxl-twitter"></i></a>
      <a href="#" class="facebook"><i class="bx bxl-facebook"></i></a>
      <a href="#" class="instagram"><i class="bx bxl-instagram"></i></a>
      <a href="#" class="google-plus"><i class="bx bxl-skype"></i></a>
      <a href="#" class="linkedin"><i class="bx bxl-linkedin"></i></a>
    </div>
  </div>
</footer><!-- End Footer -->

<div id="preloader"></div>
```

```
  <a href="#" class="back-to-top d-flex align-items-center justify-content-center"><i class="bi bi-arrow-up-short"></i></a>

  <!-- Vendor JS Files -->
  <script src="{% static 'vendor/purecounter/purecounter.js' %}"></script>
  <script src="{% static 'vendor/bootstrap/js/bootstrap.bundle.min.js' %}"></script>
  <script src="{% static 'vendor/glightbox/js/glightbox.min.js' %}"></script>
  <script src="{% static 'vendor/swiper/swiper-bundle.min.js' %}"></script>
  <script src="{% static 'vendor/php-email-form/validate.js' %}"></script>

  <!-- Template Main JS File -->
  <script src="{% static 'js/main.js' %}"></script>

</body>

</html>
```

REGISTRATION PAGE CODING

```
{% extends 'index.html' %}
{% load static %}
{% block body %}
        <!-- register -->
{% if error == "create" %}
<script>
   alert('Registration Successfull');
   window.location="{% url 'login' %}";
</script>
{% endif %}


        <section class="logins py-5">
                <div class="container py-xl-5 py-lg-3">
                        <div class="title-section mb-md-5 mb-4">
                                <h6 class="w3ls-title-sub"></h6>
                                <h3 class="w3ls-title text-uppercase text-dark font-weight-
bold">Register Now</h3>
                        </div><hr/>
                        <div class="login px-sm-12" style="width:100%">
                                <form action="" method="post"
enctype="multipart/form-data">
                                        {% csrf_token %}
                                        <div class="form-group row">
                                                <div class="col-md-6">
                                                <label>First Name</label>
                                                <input type="text" class="form-control"
name="fname" placeholder="First Name" required="">
                                                </div>
                                                <div class="col-md-6">
                                                <label>Last Name</label>
                                                <input type="text" class="form-control"
```

```
name="lname" placeholder="Last Name" required="">
                                        </div>
                                    </div>
                                    <div class="form-group row">
                                        <div class="col-md-6">
                                        <label>Username</label>
                                        <input type="text" class="form-control"
name="uname" placeholder="Username" required="">
                                        </div>
                                        <div class="col-md-6">
                                        <label>Password</label>
                                        <input type="password" class="form-
control" name="pwd" placeholder="Password" required="">
                                        </div>
                                    </div>
                                    <div class="form-group row">
                                        <div class="col-md-6">
                                        <label>Email</label>
                                        <input type="email" class="form-control"
name="email" placeholder="Enter Email" required="">
                                        </div>
                                        <div class="col-md-6">
                                        <label>Contact</label>
                                        <input type="text" class="form-control"
name="contact" placeholder="Enter Contact" required="">
                                        </div>
                                    </div>
                                    <div class="form-group row">
                                        <div class="col-md-6">
                                        <label>Date Of Birth</label>
                                        <input type="date" class="form-control"
name="dob" placeholder="" required="">
                                        </div>
                                        <div class="col-md-6">
```

```
                                        <label>Image</label>
                                        <input type="file" class="form-control"
name="image" required="">
                                        </div>
                                    </div>

                                    <div class="form-group row">
                                        <div class="col-md-6">
                                        <label class="mb-2">Address</label>
                                        <input type="text" class="form-control"
name="add" id="password1" placeholder="Enter Address" required="">
                                        </div>
                                        <div class="col-md-6">
                                        <label>User Type</label>
                                        <div class="form-control">
                                            User <input type="radio"
placeholder="Patient" name="type" style="margin-right:4%" required=""
value="Patient">
                                            Doctor <input type="radio"
placeholder="Patient" name="type" required="" value="Doctor">
                                        </div>
                                    </div>

                                    </div>
                                    <button type="submit" class="btn btn-primary
submit mt-4">Register</button>
                                    <p class="text-center mt-5">
                                        <a href="#">By clicking Register, I agree to
your terms</a>
                                    </p></form>
                        </div></div></section><!-- //register -->
{% endblock %}
```

SIGN IN PAGE CODING

```
{% extends 'index.html' %}
{% load static %}
{% block body %}
{% if error == "pat1" %}
<script>
   alert('logged in successfully');
   window.location="{% url 'patient_home' %}";
</script>
{% endif %}

{% if error == "notmember" %}
<script>
   alert('Your information verification is pending.plz login after sometimes');
   window.location="{% url 'logout' %}";
</script>
{% endif %}
{% if error == "pat2" %}
<script>
   alert('logged in successfully');
   window.location="{% url 'doctor_home' %}";
</script>
{% endif %}
{% if error == "not" %}
<script>
   alert('Username & Password are not Matching');
</script>
{% endif %}

        <!-- login -->
        <section class="logins py-5">
                <div class="container py-xl-5 py-lg-3">
                        <div class="title-section mb-md-5 mb-4">
```

```
                        <h6 class="w3ls-title-sub"></h6>
                        <h3 class="w3ls-title text-uppercase text-dark font-weight-
bold">Login Now</h3>
                    </div><hr/>
                    <div class="login px-sm-4 mx-auto mw-100 login-wrapper">
                        <form class="login-wrapper" action="" method="post">
                            {% csrf_token %}
                            <div class="form-group">
                                <label>Username</label>
                                <input type="text" class="form-control"
name="uname" placeholder="Enter Username" required="">
                                <small id="emailHelp" class="form-text
text-muted">We'll never share your Detail with anyone else.</small>
                            </div>
                            <div class="form-group">
                                <label>Password</label>
                                <input type="password" class="form-
control" name="pwd" placeholder="Enter Your Password" required="">
                            </div>
                            <button type="submit" class="btn btn-primary
submit mt-4">Login</button>
                            <p class="text-center mt-5">
                                <a href="{% url 'signup' %}"> Don't have
an Account?  Register here</a>
                            </p>
                        </form>
                    </div>
                </div>
            </section>
            <!-- //login -->
{% endblock %}
```

LUNG CANCER PREDICTION PAGE

```
{% extends 'index.html' %}
{% load static %}
{% block body %}
        <!-- register -->
        <section class="logins py-5">
                <div class="container py-xl-5 py-lg-3">
                        <div class="title-section mb-md-5 mb-4">
                                <h6 class="w3ls-title-sub"></h6>
                                <h3 class="w3ls-title text-uppercase text-dark font-weight-
bold">Lungs Cancer Prediction</h3>
                        </div><hr/>
                        <div class="login px-sm-12" style="width:100%">
                                <form action="" method="post"
enctype="multipart/form-data">
                                        {% csrf_token %}
                                        <div class="form-group row">
                                                <div class="col-md-12">
                <label>Upload Lungs Image</label>
                <input type="file" class="form-control" name="file"  required="">
                                                </div>
                                        </div>
                                        <button type="submit" class="btn btn-primary
submit mt-4">Send Lungs data</button>
                                        </form>
                        </div>
                        {% if data %}
                        <div class="container">
                                <div class="row">
                                        <div class="col-6">
                                                <h5>Input Image</h5>
                                                <img src="{{data.uploaded.url}}"
style="width:600px">
```

```
                    </div>
                    <div class="col-6">
                        <h5>Output Image</h5>
                        <img src="{{data.output.url}}"
style="width:600px">
                    </div>
                </div>
            </div>
            {% endif %}<br><br>
            {% if clas_name == "Bengin" %}
            <div class="container">
                <div class="row">
                    <div class="col-12">
                        <h2 align="center"
style="color:orange">You have a non – cancerous cells.</h2>
                        <p>Here are some of the precautions.</p>
                        <ul>
                            <li>Stop smoking immediately</li>
                            <li>Exercise regularly and maintain a
balanced diet.</li>
                            <li>Avoid carcinogens at work</li>
                        </ul>
                    </div>
                </div>
            </div>
            {% elif clas_name == "Normal" %}
            <div class="container">
                <div class="row">
                    <div class="col-12">
                        <h2 align="center" style="color:green">You
are healthy.</h2>
                    </div>
                </div>
            </div>
```

```
{% elif clas_name == "Malignant" %}
<div class="container">
    <div class="row">
        <div class="col-12">
            <h2 align="center" style="color:red">You have a cancerous cells. You may visit your nearby doctor and get treated immediately</h2>
        </div>
    </div>
</div>
{% endif %}

{% if data and clas_name != "Normal" %}
<div class="container-fluid">
    <h1 align="center" style="font-weight:bold;font-family : 'Monotype Corsiva' ; color : #E6120E ;margin-top:4%">You can connect with our Doctors</h1>
</div><hr>
            <table id="example" class="display" style="width:100%">
                <thead>
                    <tr>
                        <th>#</th>
                        <th>Full Name</th>
                        <th>Image</th>
                        <th>Email</th>
                        <th>Contact</th>
                        <th>Address</th>


                    </tr>
                </thead>
                <tbody>
                {% for i in doctor %}
```

```
                                        <tr>
                                          <td>{{forloop.counter}}</td>
                                          <td>{{i.user.first_name}}
{{i.user.last_name}}</td>
                                          <td><img src="{{i.image.url}}"
style="width:80px;height:80px"></td>
                                          <td>{{i.user.email}}</td>
                                          <td>{{i.contact}}</td>
                                          <td>{{i.address}}</td>

                                    </tr>
                                    {% empty %}
                                          <td colspan="6">There is no doctor
available.</td>
                                    {% endfor %}
                                </tbody>
                            </table>
                        </div>
                            {% endif %}

                    </div>
            </section>
            <!-- //register -->

{% endblock %}
```

VIEW PREDICTION HISTORY PAGE CODING

```
{% extends 'index.html' %}
{% load static %}
{% block body %}

<div class="container-fluid" style="width:90%;margin-top:12%">
            <div class="container-fluid">
              <h1 align="center" style="font-weight:bold;font-family : 'Monotype Corsiva' ; color : #E6120E ;margin-top:4%">View Prediction History</h1>
               </div><hr>
                  <table id="example" class="display" style="width:100%">
                   <thead>
                    <tr>
                      <th>#</th>
                      {% if request.user.patient_set.all.0 %}
                      <th>Date</th>
                      {% else %}
                      <th>Patient Name</th>
                      {% endif %}
                      <th>Accuracy</th>
                      <th>Result</th>
                      <th>Entered Value(Input)</th>
                      <th>Prediction For</th>
                      <th>Action</th>

                    </tr>
                  </thead>
                  <tbody>
                  {% for i in data %}
                   <tr>
                     <td>{{forloop.counter}}</td>
                     {% if request.user.patient_set.all.0 %}
                       <td>{{i.created}}</td>
```

```
                    {% else %}
                    <td>{{i.patient.user.first_name}} {{i.patient.user.last_name}}</td>
                    {% endif %}
                     <td>{{i.prediction_accuracy}}</td>
                     <td>{% if i.result == "0" %}
                       <h5 style="color:green">Healthy</h5>
                       {% elif i.result == "1" %}
                         <h5 style="color:red">Unhealthy</h5>
                     {% elif i.result == 'Bengin' %}
                        {{i.result}}(Unhealthy)
                        {% elif i.result == 'Malignant' %}
                        {{i.result}}(Unhealthy)

                        {% elif i.result == 'Normal' %}
                        {{i.result}}(Healthy)
                        {% else %}
                        {{i.result}}

                        {% endif %}
                    </td>
<!--                      <td>{{i.result}}</td>-->
                    <td>
                       {% if i.predict_for == "Lungs Cancer Prediction" %}
                       <img src="{{i.uploaded.url}}" style="width:50px;height:50px">
                       {% else %}
                       {{i.values_list}}
{% endif %}
                    </td>
                    <td>{{i.predict_for}}</td>
                    <td style="width:150px">
                       <a href="/detail_searched/{{i.id}}" ><button class="btn btn-info"><i class="fa fa-eye"></i></button></a>

                       <a href="/delete_searched/{{i.id}}" ><button class="btn btn-
```

```
danger" onclick="return confirm('Are you sure?')"><i class="fa fa-trash-o"></i></button></a></td>
                    </tr>
                    {% endfor %}
                  </tbody>
                </table>
              </div>
{% endblock %}
```

EDIT PROFILE PAGE CODING

```
{% extends 'index.html' %}
{% load static %}
{% block body %}
        <!-- register -->
{% if terror == "create" %}
<script>
   alert('Detailed Updated Successfully');
   window.location="{% url 'profile_doctor' %}";
</script>
{% endif %}


        <section class="logins py-5">
                <div class="container py-xl-5 py-lg-3">
                        <div class="title-section mb-md-5 mb-4">
                                <h6 class="w3ls-title-sub"></h6>
                                <h3 class="w3ls-title text-uppercase text-dark font-weight-bold">Update My Detail</h3>
                        </div><hr/>
                        <div class="login px-sm-12" style="width:100%">
                                <form action="" method="post" enctype="multipart/form-data">
                                        {% csrf_token %}
                                        <div class="form-group row">
                                                <div class="col-md-6">
                                                <label>First Name</label>
                                                <input type="text" class="form-control" value="{{doc.user.first_name}}" name="fname" placeholder="First Name" required="">
                                                </div>
                                                <div class="col-md-6">
                                                <label>Last Name</label>
```

```
                                        <input type="text" class="form-control" value="{{doc.user.last_name}}" name="lname" placeholder="Last Name" required="">
                                    </div>
                                </div>
                                <div class="form-group row">
                                    <div class="col-md-6">
                                    <label>Email</label>
                                    <input type="email" class="form-control" value="{{doc.user.email}}" name="email" placeholder="Enter Email" required="">
                                    </div>
                                    <div class="col-md-6">
                                    <label>Contact</label>
                                    <input type="text" class="form-control" name="contact" value="{{doc.contact}}" placeholder="Enter Contact" required="">
                                    </div>
                                </div>
                                {% if error != "pat" %}
                                <div class="form-group row">
                                    <div class="col-md-12">
                                    <label>Specialist</label>
                                        <input name="type" class="form-control" value="{{doc.category}}">
                                    </div>
                                </div>
                                {% endif %}
                                <div class="form-group row">
                                    <div class="col-md-6">
                                    <label class="mb-2">Address</label>
                                    <input type="text" class="form-control" value="{{doc.address}}" name="add" id="password1" placeholder="Enter Address" required="">
                                    </div>
                                    <div class="col-md-4">
```

```
                                        <label>Image</label>
                                        <input type="file" class="form-control"
name="image">
                                        </div>
                <div class="col-md-2">
                                        <img src="{{doc.image.url}}"
style="width:100%;height:150px">
                                        </div>
                                    </div>
                                    <button type="submit" class="btn btn-primary
submit mt-4">Update Detail</button>
                                </form>
                            </div>
                </div>
            </section>
            <!-- //register -->

{% endblock %}
```

CHANGE PASSWORD PAGE CODING

```
{% extends 'index.html' %}
{% load static %}
{% block body %}
        <!-- register -->
{% if terror == "yes" %}
<script>
   alert('Password Changed.....');
   window.location=('{% url 'logout' %}')
</script>
{% endif %}
{% if terror == "not" %}
<script>
   alert('New Password and Confirm Password are not match');
</script>
{% endif %}


        <section class="logins py-5">
                <div class="container py-xl-5 py-lg-3">
                        <div class="title-section mb-md-5 mb-4">
                                <h6 class="w3ls-title-sub"></h6>
                                <h3 class="w3ls-title text-uppercase text-dark font-weight-
bold">Change Password</h3>
                        </div><hr/>
                        <div class="login px-sm-12" style="width:100%">
                                <form action="" method="post"
enctype="multipart/form-data">
                                        {% csrf_token %}
                                        <div class="form-group row">
                                                <div class="col-md-12">
                                                <label>Old Password</label>
                                                <input type="password" class="form-
```

```
control" name="pwd3" required="">
                                        </div>
                                    </div>
                <div class="form-group row">
                                        <div class="col-md-12">
                                        <label>New Password</label>
                                        <input type="password" class="form-
control" name="pwd1" required="">
                                        </div>
                                    </div>
                <div class="form-group row">
                                        <div class="col-md-12">
                                        <label>Confirm Password</label>
                                        <input type="password" class="form-
control" name="pwd2" required="">
                                        </div>
                                    </div>

                                    <button type="submit" class="btn btn-primary
submit mt-4">Register Disease</button>
                                </form>
                            </div>
                        </div>
                    </section>
                    <!-- //register -->

{% endblock %}
```

ADMIN LOGIN PAGE CODING

```
{% extends 'base.html' %}
{% load static %}
{% block body %}
<section class="section-services section-t8">
   <div class="container">
   <h3>Admin Sign In</h3><hr>
   <div class="form">
    <form class="form-a" action="" method="post" enctype="multipart/form-data">
       {% csrf_token %}
      <div class="row">
       <div class="col-md-12 mb-2">
        <div class="form-group">
         <label class="pb-2" for="Type">Username</label>
         <input type="text" class="form-control form-control-a"
placeholder="Username" name="username">
        </div>
       </div>
       <div class="col-md-12 mb-2">
        <div class="form-group">
         <label class="pb-2" for="Type">Password</label>
         <input type="password" class="form-control form-control-a"
placeholder="Password" name="password">
        </div>
       </div>
       <div class="col-md-12">
        <button type="submit" class="btn btn-b">Sign In</button>
       </div></div></form></div></div>
{% include 'footer.html' %}
{% endblock  %}
```

VIEW ALL REG. USERS PAGE CODING

```
{% extends 'index.html' %}
{% load static %}
{% block body %}

<div class="container-fluid" style="width:90%;margin-top:8%">
            <div class="container-fluid">
              <h1 align="center" style="font-weight:bold;font-family : 'Monotype Corsiva' ; color : #E6120E ;margin-top:4%">View Patient</h1>
              </div><hr>
                  <table id="example" class="display" style="width:100%">
                    <thead>
                      <tr>
                        <th>#</th>
                        <th>Full Name</th>
                        <th>Image</th>
                        <th>Email</th>
                        <th>Contact</th>
                        <th>Address</th>
                        <th>Action</th>

                      </tr>
                    </thead>
                    <tbody>
                    {% for i in patient %}
                      <tr>
                        <td>{{forloop.counter}}</td>
                        <td>{{i.user.first_name}} {{i.user.last_name}}</td>
                        <td>{% if i.image %}<img src="{{i.image.url}}" style="width:80px;height:80px">{% endif %}</td>
                        <td>{{i.user.email}}</td>
                        <td>{{i.contact}}</td>
                        <td>{{i.address}}</td>
```

```
                    <td style="width:150px">
                        <a href="{% url 'delete_patient' i.id %}" ><button class="btn btn-danger" onclick="return confirm('Are you sure?')"><i class="fa fa-trash-o"></i></button></a></td>
                    </tr>
                    {% endfor %}
                </tbody>
            </table>
        </div>
{% endblock %}
```

Testing

Testing is an important aspect of any software system to ensure that it performs as expected and meets the required quality standards. The Lung Cancer Prediction System using Efficient Net can be tested in the following ways:

1. Unit testing: This involves testing individual components of the system such as the deep learning model, database queries, and API endpoints to ensure that they are functioning as expected.
2. Integration testing: This involves testing the interactions between different components of the system to ensure that they are integrated correctly and work together as expected.
3. User acceptance testing: This involves testing the system with real users to ensure that it meets their needs and expectations.
4. Performance testing: This involves testing the system's performance under different load conditions to ensure that it can handle the expected traffic and user load.
5. Security testing: This involves testing the system's security features to ensure that it is protected against common security threats such as SQL injection, cross-site scripting, and other vulnerabilities.
6. Regression testing: This involves testing the system after any changes or updates have been made to ensure that existing functionality has not been affected.

Overall, thorough testing of the Lung Cancer Prediction System using Efficient Net will help ensure that it is reliable, accurate, and effective in predicting lung cancer.

CHAPTER # 8
Advantages & Limitations

Advantages of "Lung Cancer Prediction System":

The advantages of the Lung Cancer Prediction System using Efficient Net are:

1. Early detection: The system enables early detection of lung cancer by analyzing medical images, which can help in improving the chances of successful treatment.
2. Accuracy: The system uses deep learning algorithms, which provide a high level of accuracy in predicting the presence of cancer in medical images.
3. Speed: The use of Efficient Net architecture enables faster processing of medical images, which helps in reducing the time taken for diagnosis.
4. Cost-effective: The system reduces the need for human experts to analyze medical images, which can help in reducing the cost of diagnosis.
5. User-friendly: The system is designed to be user-friendly and easy to use, which helps in increasing its adoption among healthcare professionals.
6. Scalability: The system is scalable and can be easily integrated into existing healthcare systems, which makes it suitable for use in various healthcare settings.
7. Improved patient outcomes: By enabling early detection and accurate diagnosis, the system can help in improving patient outcomes and reducing the mortality rate associated with lung cancer.

Limitations of "Lung Cancer Prediction System":

Some potential limitations of the Lung Cancer Prediction System using Efficient Net could include:

1. Accuracy: While deep learning models such as Efficient Net are capable of achieving high levels of accuracy, there is always a chance that the predictions may not be completely accurate due to the complexity and variability of cancer diagnoses.
2. Data Availability: The quality and quantity of data used to train the model can have a significant impact on the accuracy of the predictions. If the training data is not diverse enough or does not represent the target population, the model may not perform as well.
3. Ethical Considerations: Predictive models like this can raise ethical concerns related to data privacy, informed consent, and potential biases. It is important to carefully consider and address these issues to ensure the fair and ethical use of the system.
4. Technical Expertise: Developing and deploying deep learning models requires specialized technical expertise. Without the necessary skills and resources, it may be challenging to build and maintain a system like this.
5. Cost: The implementation and maintenance of a system like this can be costly, both in terms of time and resources. This may limit its accessibility to certain healthcare organizations or patients.

CHAPTER # 9
Future Scope

FUTURE SCOPE

The future scope of Lung Cancer Prediction System using Efficient Net is quite promising. Some of the possible future directions of this project are:

1. Enhancing the accuracy of the model: The current model can be improved by incorporating more data and refining the training process to achieve better accuracy.
2. Extending the system for other types of cancer: The system can be extended to predict other types of cancer as well. This can be done by training the model on different types of cancer datasets.
3. Developing a mobile application: The system can be extended by developing a mobile application to make it more accessible to the users. This would allow users to use the system on-the-go.
4. Integrating Electronic Health Records (EHR): Integrating the system with Electronic Health Records (EHR) can provide doctors with more comprehensive patient data, which can further improve the accuracy of the model.
5. Enhancing the user interface: The system's user interface can be enhanced to make it more user-friendly and engaging for the users.
6. Collaborating with medical institutes: Collaborating with medical institutes can provide access to a larger dataset and more accurate medical records, which can lead to better model accuracy.
7. Developing a clinical decision support system: The system can be extended to become a clinical decision support system that can aid doctors in diagnosing lung cancer and other types of cancer.

CONCLUSION

Lung Cancer Prediction System using Efficient Net is an innovative and effective solution to predict lung cancer at an early stage. By implementing deep learning and machine learning techniques, this system can accurately detect and classify lung nodules from CT scan images. It can assist doctors and patients in making informed decisions regarding further diagnosis and treatment. The system is highly scalable, efficient, and cost-effective, making it accessible to a large population. Although there are some limitations, such as the need for high-quality CT scans and a trained model, the benefits of early detection and prevention of lung cancer outweigh them. Overall, the Lung Cancer Prediction System using Efficient Net has the potential to improve healthcare outcomes and save lives.

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