# Technical Paper

# +PHARHELP

| Name | Role | Date |
|---|---|---|
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# Abstract

Nowadays Online Doctor appointment System in hospital today necessitate a competent administration when handling patients, generating reports, User (Patient) details which serves as a key factor for the flow of business in Hospital. Aim of this project is to create doctor patient handling management system that will help doctors in their work and will also help patients to book doctor appointments and view booking history. Our research project is aimed at booking an appointment for the patients.

Each time a user visits our website his/her registration is stored in the database and the next time he/she can just log in. The module is designed to help Patient requirements through easy /instant searches. It consists of the planning process, Requirement Phase, Design Phase, Coding Phase, Testing Phase of the web application. The entire development process is primarily divided into two parts: the front-end development and the back- end development. The database design is also discussed with an emphasis on its relational connectivity. For frontend framework we used an Angular 13 version and for backend we used in full stack java.

# Introduction

## Angular

Angular 13 is an open-source Typescript framework for building web applications and apps in JavaScript, html, and Typescript which is a superset of JavaScript. Angular provides built-in features for animation, http service, and materials which in turn have features such as auto-complete, navigation, toolbar, menus, etc. The code is written in Typescript, which compiles to JavaScript and displays the same in the browser. Angular is a development platform, built on TypeScript. As a platform, Angular includes:

- A component-based framework for building scalable web applications
- A collection of well-integrated libraries that cover a wide variety of features, including routing, forms management, client-server communication, and more
- A suite of developer tools to help you develop, build, test, and update your code

With Angular, you're taking advantage of a platform that can scale from single- developer projects to enterprise-level applications. Angular is designed to make updating as straightforward as possible, so take advantage of the latest developments with a minimum of effort.

### Single Page Application

A single page application is a web application or a website which provides users a very fluid, reactive and fast experience similar to a desktop application. It contains menu, buttons and blocks on a single page and when a user clicks on any of them; it dynamically rewrites the current page rather than loading entire new pages from a server. That's the reason behind its reactive fast speed.

### Angular Features

- Angular supports multiple platforms
- Progressive web applications: Progressive web applications are the mostcommon apps which are built with Angular.
- Angular provides modern web platform capabilities to deliver high performance, offline, and zero-step installation apps.

- High Speed, Ultimate Performance
- **Code splitting:** Angular apps are fast and loads quickly with the new Component Router, which delivers automatic code-splitting so users only load code required to render the view they request Productivity
- **Powerful templates:** Angular provides simple and powerful template syntax to create UI view quickly.
- **IDEs:** Angular provides intelligent code completion, instant errors, and other feedback in popular editors and IDEs.
- **Angular CLI:** Angular CLI provides command line tools start building fast, add components and tests, and then instantly deploy.
- **Full Stack Development**
- **Animation Support:** Angular facilitates you to create high-performance, complex choreographies and animation timelines with very little code through Angular's intuitive API.
- **Accessibility:** In Angular, you can create accessible applications with ARIA-enabled components, developer guides, and built-in all test infrastructures.

## Core Java

The Java SE is a computing-based platform and used for developing desktop or Window based applications. Thus, core Java is the part of Java SE where the developers develop desktop-based applications by using the basic concepts of Java where JDK (Java Development Kit) is a quite familiar Java SE implementation.

**Features**

- Simple. Java is easy to learn and its syntax is quite simple, clean and easy to understand .The confusing and ambiguous concepts of C++ are either left out in Java ...
- Object Oriented. In java, everything is an object which has some data and behaviour. Java can be easily extended as it is based on Object Model.
- Robust. Java makes an effort to eliminate error prone codes by emphasizing mainly on compile time error checking and runtime checking.
- Platform Independent. Unlike other programming languages such as C, C++ etc which are compiled into platform specific machines.

## Advanced Java:

Advance Java, I.e. Java Enterprise Edition abbreviated as JEE will give you the library for understanding the client-server architecture. It will help you further with web application development learning. Learning is important because you can't grasp these modules in Core Java.

J2EE is yet another vital section that is platform Independent, as well as Java Centric environment. It will help in the development, building & deployment of the Web- based applications online. Services, APIs, and protocols, providing the necessary functionality fall under this category. All these entities are necessary for the development of multi-tiered, and web-based applications.

It will also give the opportunity of working with Web and Application Servers. Some of them are Apache Tomcat, Glassfish etc. It assists the learners in understanding the communication over the HTTP protocol.

frameworks like Spring, JSF, and Struts are the core component of Advanced Java . So, with it, you'll get the opportunity of developing web as a secure transaction app for domains like Banking, Legal, Financial, E-Commerce, Healthcare, Inventory, to name a few. Core and advanced Java concepts will help in understanding the hot technologies. Some of them are Hadoop and Cloud services.

### Java 8 Features

- Lambda expressions,
- Method references,
- Functional interfaces,
- Stream API,

## MySQL

- MySQL is a widely used relational database management system (RDBMS).
- MySQL is free and open-source.
- MySQL is ideal for both small and large applications.

## Features

- Ease of Management – It is pretty easy to download and use the software.
- High performance – It provides fast loading utilities with different memory cache.
- Scalable – With MySQL, you can scale anytime you like. It is really easy to create data warehouses including an enormous amount of data.
- Compatibility – MySQL is compatible with all modern platforms like Windows, Linux, Unix.
- Performance – MySQL gives you high-performance results without losing essential functionality.
- Complete Data Security – Only the authorized users can access the database. Complete security for the data.
- Low Cost – It is free to use.
- Memory Efficiency – MySQL has low memory leakage.

## Eclipse IDE

- Eclipse IDE is one of the most powerful integrated development environments (IDEs) ever built. This well-designed, robust, and feature-loaded IDE is in use in most of the current IT environments.

## Node JS

- Node.js is an open-source server environment.
- Node.js allows you to run JavaScript on the server.

## Spring Boot :

Spring Initializr is a tool that bootstraps your Spring Boot projects. This **Spring Boot feature** powers project creation through cURL, multiple IDEs, and its very own Spring CLI. It doesn't generate any application code but provides a basic project structure. All you need to do is write the application code.

Spring Initializr allows you to select a project, the programming language of your choice, and add dependencies such as dev tools, actuator, web, etc. Generating a project is as quick as clicking the Generate button after selecting the options provided on the Spring Initializer screen.

For example, the generated project includes the Gradle build specification or pom.xml on selecting the Gradle or Maven project, respectively. Also, it consists of a class with a main () method to bootstrap the application. There is an application context that uses the Spring Boot auto-configuration and empty properties file so you can add configuration properties.

The Spring Boot CLI is a command-line tool that you can use to develop a Spring application quickly. By using Spring CLI, you can execute Groovy scripts, so you can code by using your knowledge of Java, that too, without the need to write reusable code repeatedly. You can start a new project by using the starter component that resolves dependencies.

This **Spring Boot feature** has a few commands that can help you use the Initializr to kick-start development on a more traditional Java project. For example, the init command provides an interface to the Initializr to create a baseline project. The resulting zip file has the project structure where you can add your own configuration. If not, you can customize code too.

Imagine you want to create a new library that you want to use at various places in your application. You may be able to develop and integrate the code; however, you may still be required to manually do a lot of configuration. It is here that the autoconfiguration feature provided by Spring Boot comes into the picture.

While creating a new project, Spring Boot allows you to choose dependencies for your project. It is these dependencies, based on which the autoconfiguration feature loads specific default configurations. The AutoConfiguration class is fortified with @Conditional annotations that activate beans in particular circumstances. Spring Boot evaluates these conditionals during the startup of an application

In Spring Boot applications, all configuration parameters are read from either application.properties or application.yaml resource file. However, there may be cases when you may want to move your configuration from one environment to another. This is when you may have to configure these properties for which you will be required to rebuild and retest your application in all environments. Not only that, every time a change happens, you will also have to redeploy your application in the production environment.

To overcome this problem, Spring Boot enables you to externalize your configuration. Externalizing the configuration means using the application code that you use in one environment in an external environment. Spring Boot lets you externalize your configuration so you can reuse your code in diverse environments. The following files can be used to externalize configuration

## Micro Services

Java Microservices are increasingly used in the development world as developers work to create larger, more complex applications that are better developed and managed as a combination of smaller services that work cohesively together for larger, application-wide functionality. Tools are rising to meet the need to think about and build apps using a piece-by-piece methodology that is, frankly, less mind-boggling than considering the whole of the application at once.

## Spring Security

Spring Security is a framework which provides various security features like: authentication, authorization to create secure Java Enterprise Applications.It overcomes all the problems that come during creating non spring security applications and manage new server environment for the application.This framework targets two major areas of application are authentication and authorization. Authentication is the process of knowing and identifying the user that wants to access. Authorization is the process to allow authority to perform actions in the application. The beauty of this framework is its flexible authentication nature to integrate with any software solution. Sometimes, developers want to integrate it with a legacy system that does not follow any security standard, there Spring Security works nicely.

## Maven :

Maven is a powerful project management tool that is based on POM (project object model). It is used for projects build, dependency and documentation.It simplifies the build process like ANT. But it is too much advanced than ANT

**Features:**

- It makes a project easy to build.
- It provides uniform build process (maven project can be shared by all themaven projects).
- It provides project information (log document, cross referenced sources,mailing list, dependency list, unit test reports etc.).
- It is easy to migrate for new features of Maven.

## Bootstrap

Bootstrap is a free and open-source CSS and JavaScript / jquery code library used to create dynamic website layouts and apps. Bootstrap is a famous front-end framework with a decent variety of pre-defined CSS codes.

Bootstrap 5 is the most recent and stable version of the Bootstrap framework. Bootstrap is responsive by default, and it takes a mobile-first approach. Bootstrap 5 is compatible with the most recent, stable releases of all major browsers and systems.

## Angular Components

Components are the most basic UI building block of an Angular app. An Angular app contains a tree of Angular components.

Angular components are a subset of directives, always associated with a template. Unlike other directives, only one component can be instantiated for a given element in a template.

A component must belong to an NgModule in order for it to be available to another component or application. To make it a member of an NgModule, list it in the declarations field of the NgModule metadata.

- Pagination
- Radio button
- Check Button
- Menu
- JJWT

## JDBC

JDBC stands for Java Database Connectivity. JDBC is a Java API to connect and execute the query with the database. It is a part of JavaSE (Java Standard Edition). JDBC API uses JDBC drivers to connect with the database.

## Hibernate

### ORM (Object Relation Mapping)

Object Relational Mapping (ORM) briefly tells you about what is ORM and how it works. ORM is a programming ability to covert data from object type to relational type and vice versa.

The main feature of ORM is mapping or binding an object to its data in the database. While mapping we have to consider the data, type of data and its relations with its self-entity or entity in any other table.

## Advanced Features

- **Idiomatic persistence:** It enables you to write the persistence classes using object oriented classes.
- **High Performance:** It has many fetching techniques and hopeful locking techniques.
- **Reliable:** It is highly stable and eminent. Used by many industrial programmers.
- **JPA**

## Spring-Rest Controller:

Spring Boot is built on the top of the spring and contains all the features of spring. And it is becoming a favorite of developers these days because of its rapid production-ready environment which enables the developers to directly focus on the logic instead of struggling with the configuration and setup. Spring Boot is a microservice-based framework and making a production-ready application in it takes very little time. There are mainly two controllers are used in the spring, controller and the second one is RestController with the help of @controller and @restcontroller annotations. The main difference between the @restcontroller and the @controller is that the @restcontroller combination of the @controller and @ResponseBody annotation.

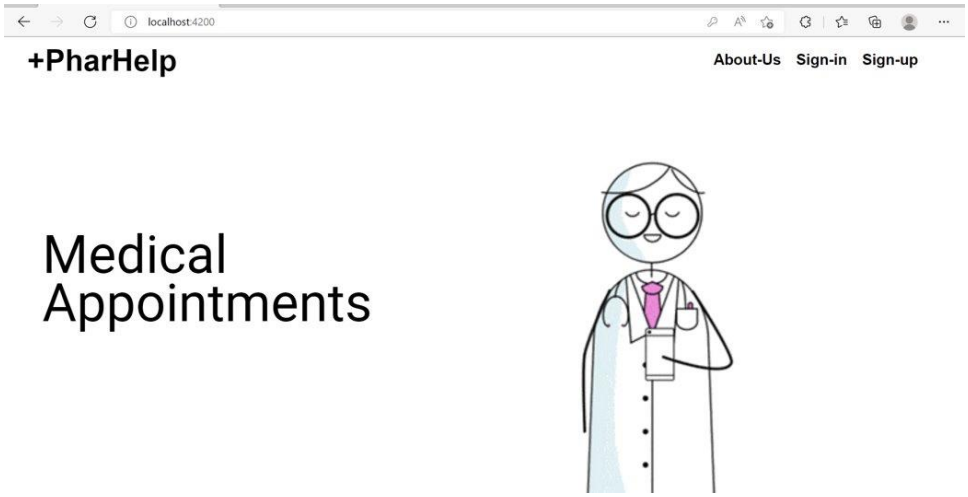
## Technologies

## Learning

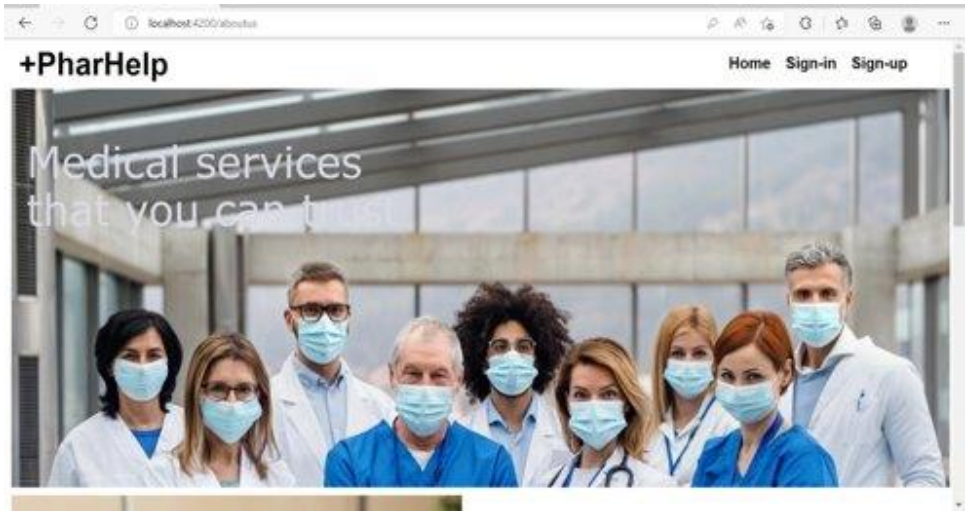
| Item | Experiment | Results |
|---|---|---|
| Java | Design & Develop business application | Business application functions using Java features |
| MySQL | Design & Develop Database | Creating tables, mapping, joining (CRUD Operations) |
| Spring Framework | Spring Boot | Created API and tested API in postman with HTTP (Get/Post/Put/Delete) Concise code using Annotations |
| HTML/CSS | Web Page design | Developed Web Pages |
| Angular 13 | Web Page Design | Developed Web Pages |
| Microservice | Microservice implementation | Created microservices and listed in Eureka server and API Gateway. |

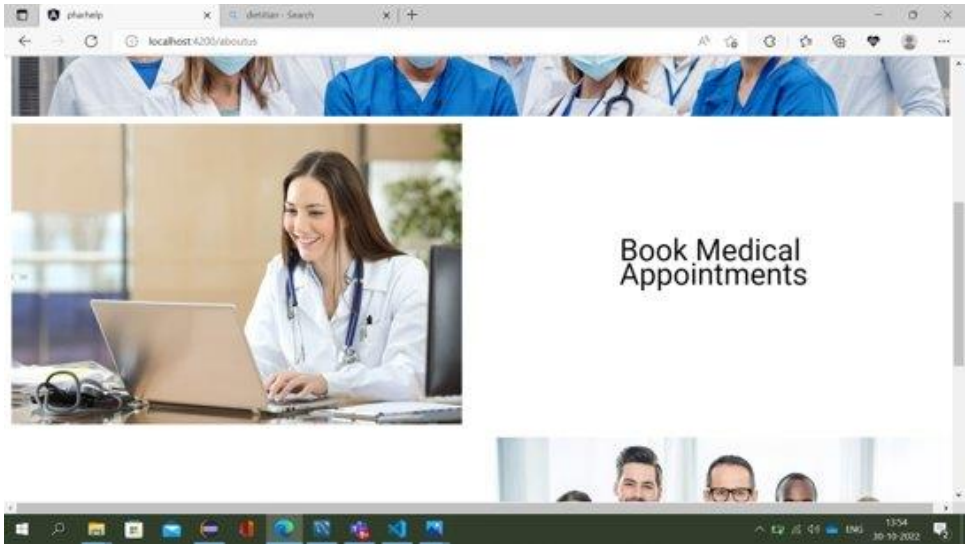
## Results : web pages

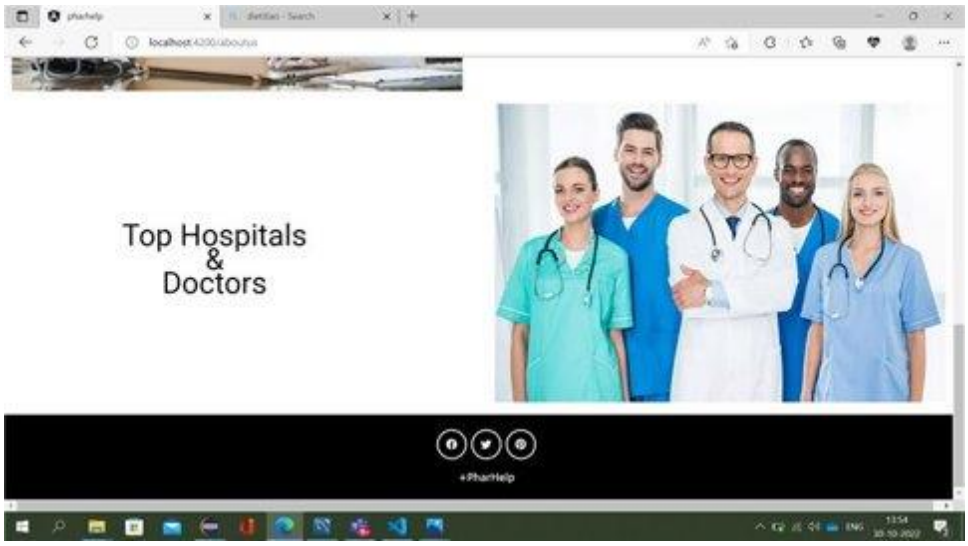
## Home Page:



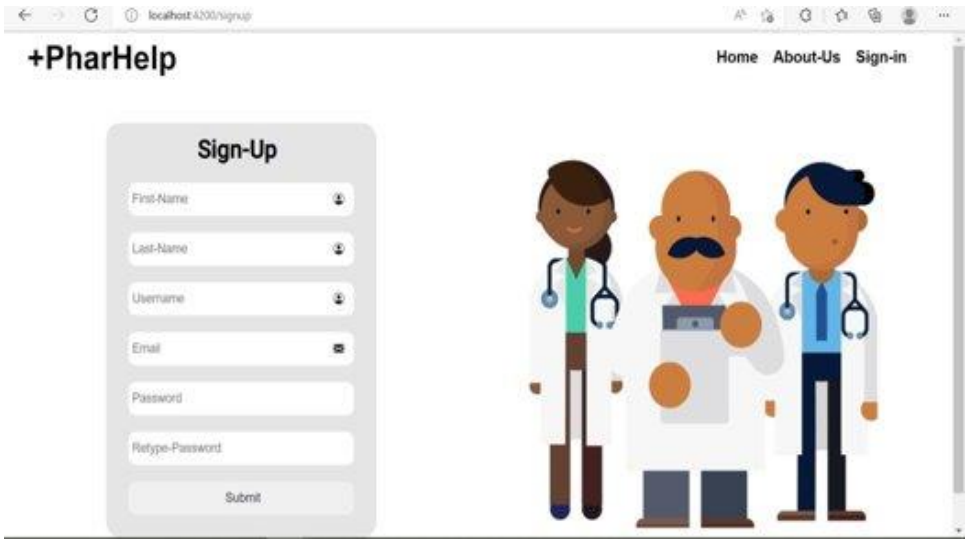
## Aboutus Page:

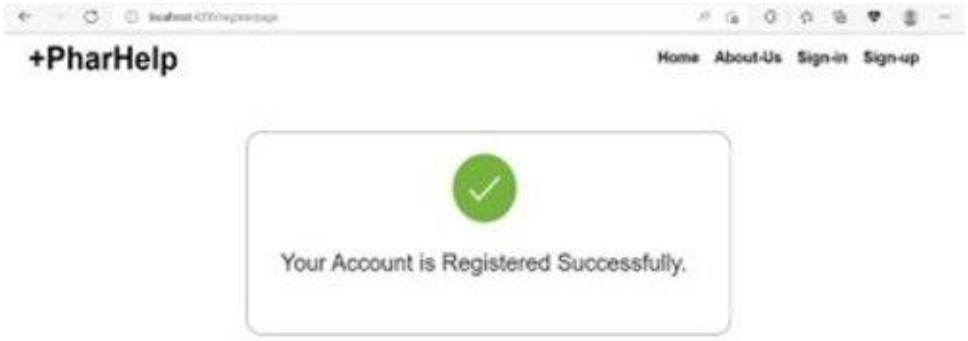


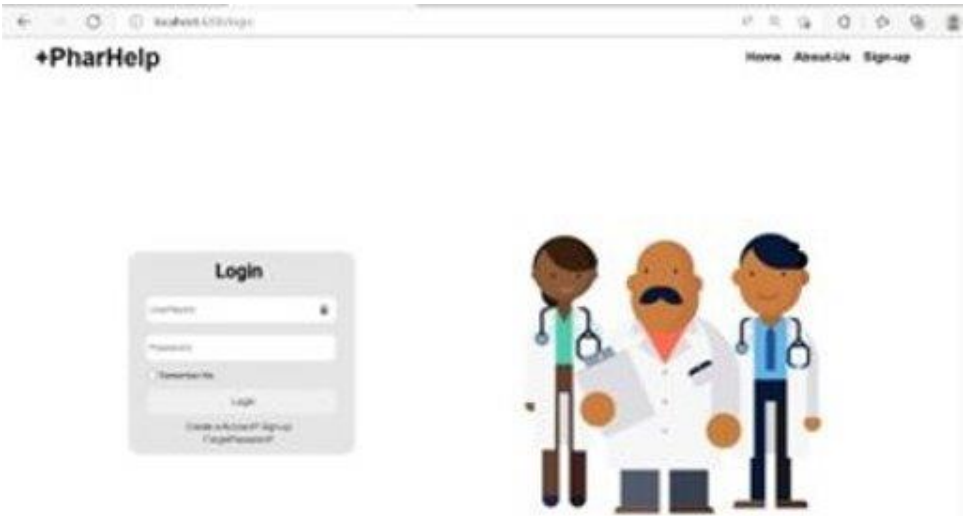

Top Hospitals
&
Doctors
+PharHelp

## User Registration:

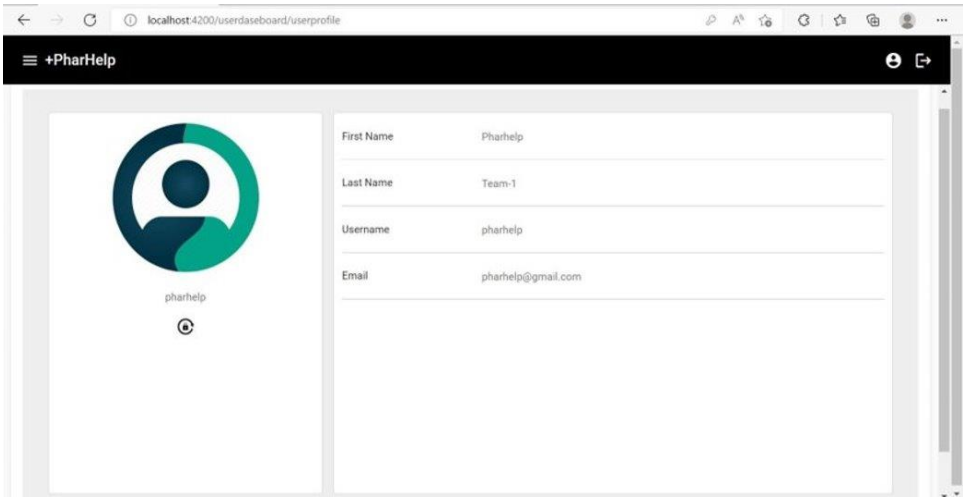


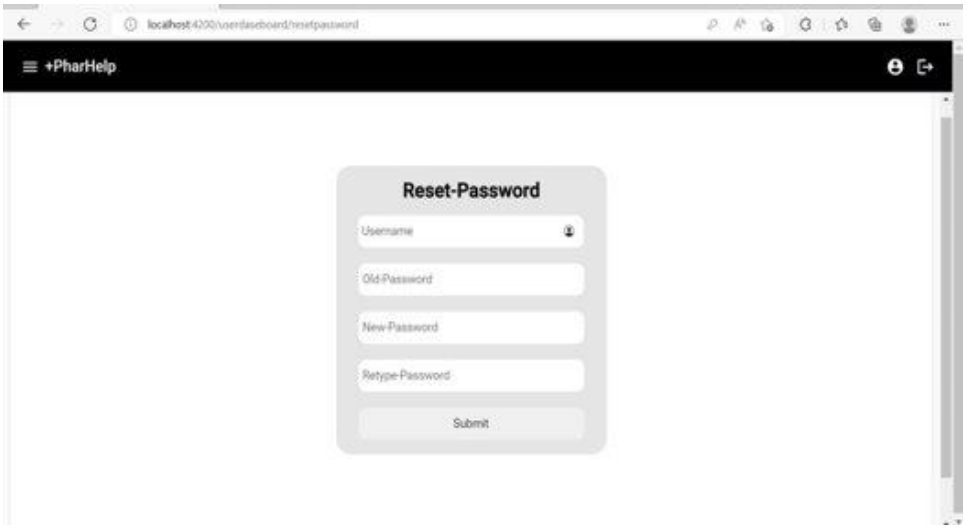



## User Login:

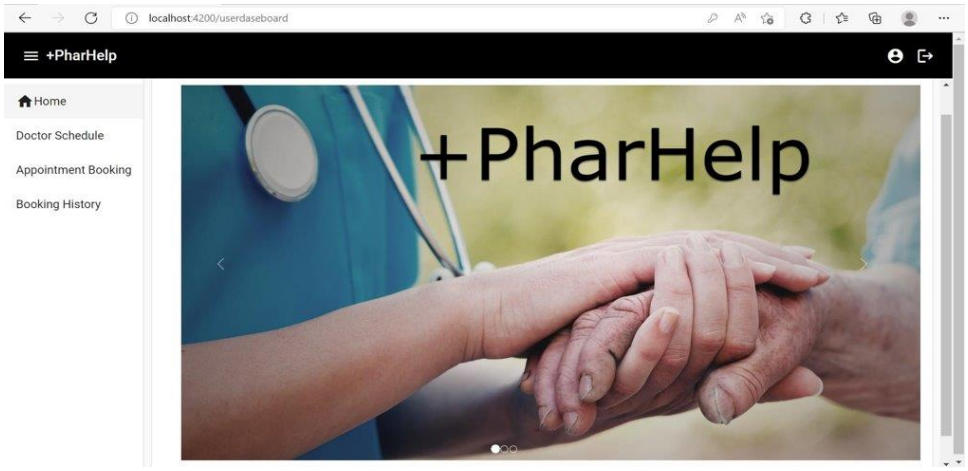

+PharHelp
Home
About-Us
Sign-up
Login

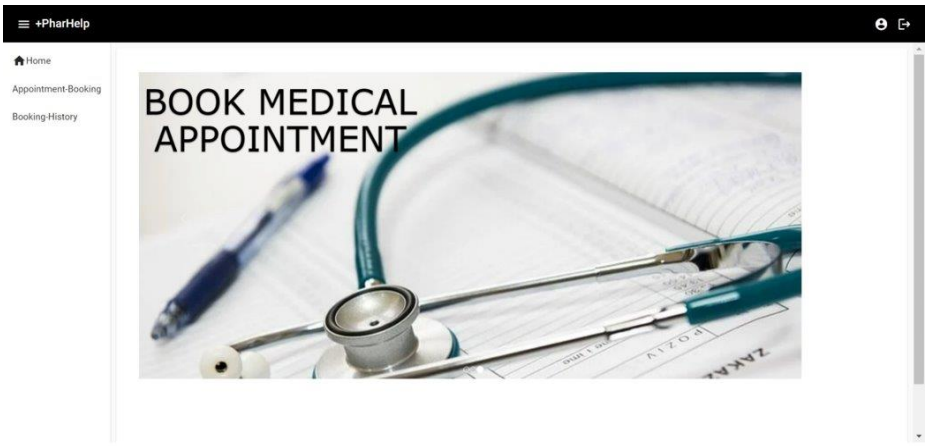

+PharHelp
Home
About-Us
Sign-up
Forgot-Password
Email
Old Password
New Password
Retype Password
Submit

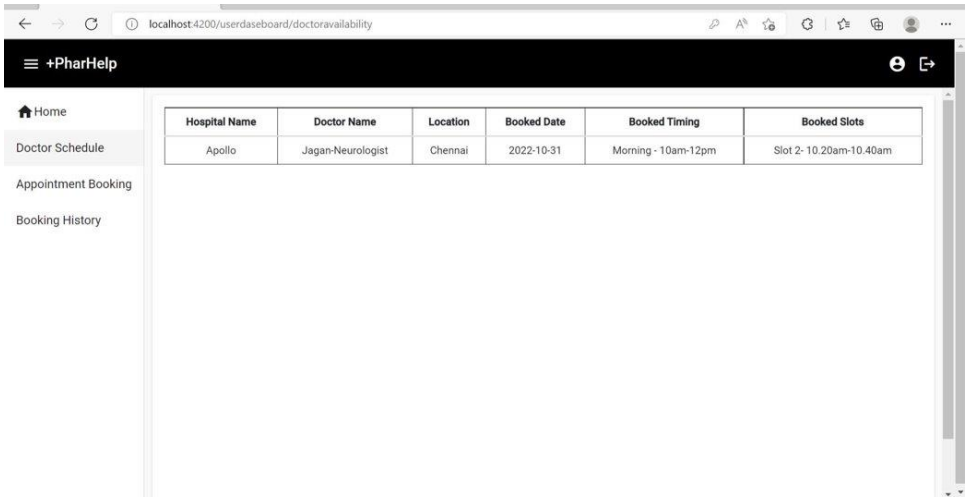

localhost:4200/userdaseboard/userprofile
+PharHelp
pharhelp
First Name
Pharhelp
Last Name
Team-1
Username
pharhelp
Email
pharhelp@gmail.com

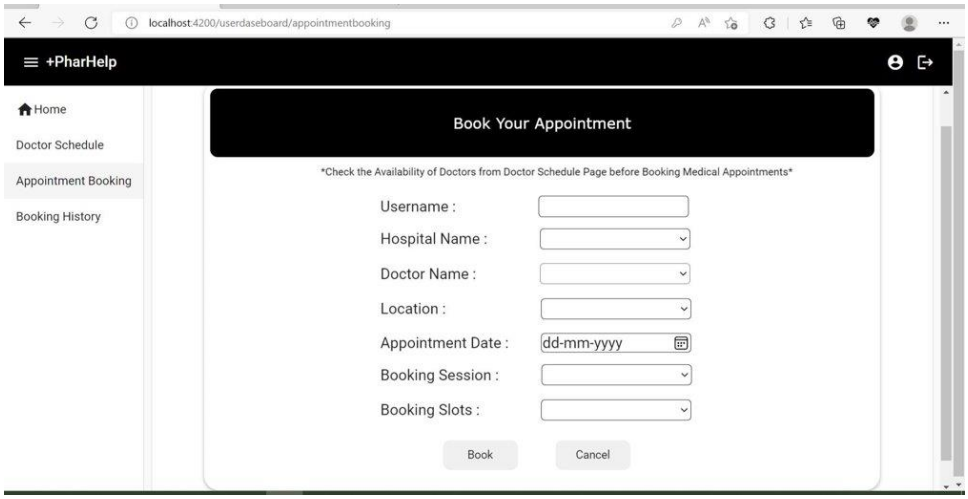

localhost:4200/userdaseboard/resetpassword
+PharHelp
Reset-Password
Username
Old-Password
New-Password
Retype-Password
Submit

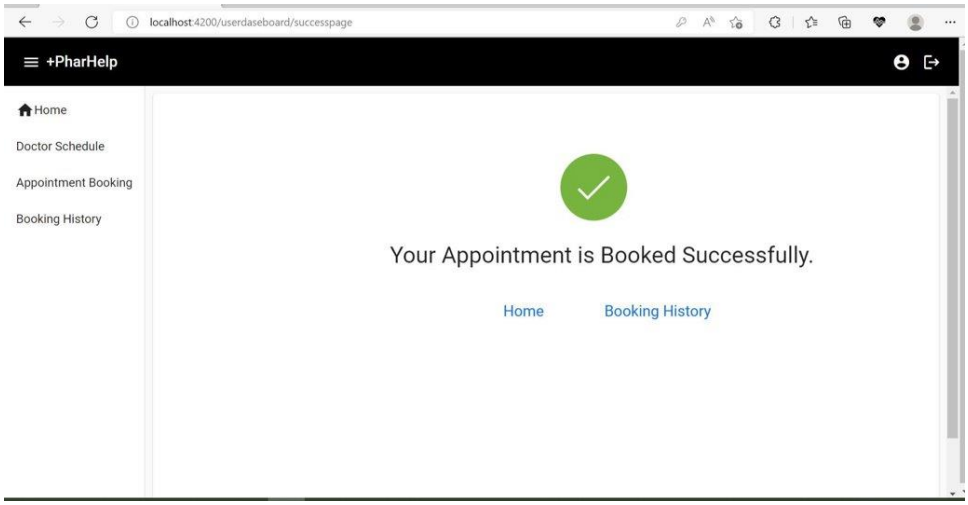
## User Dashboard Page:



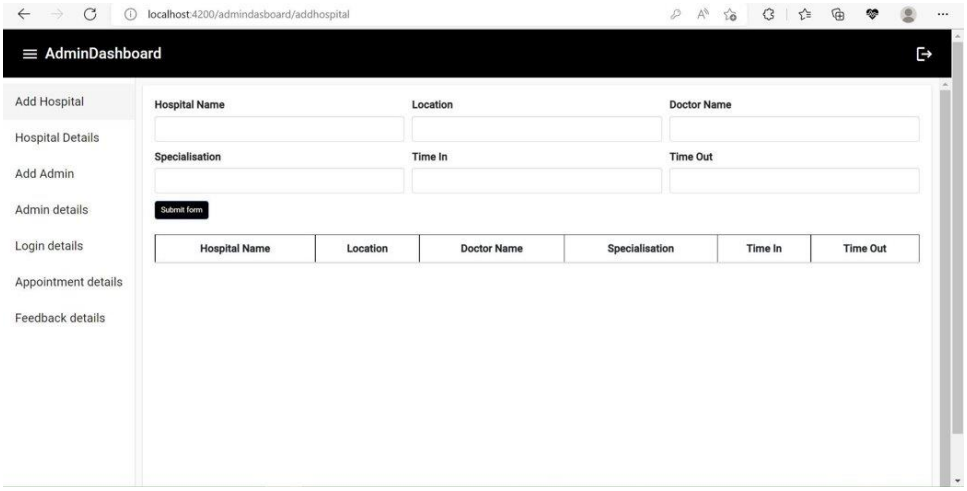



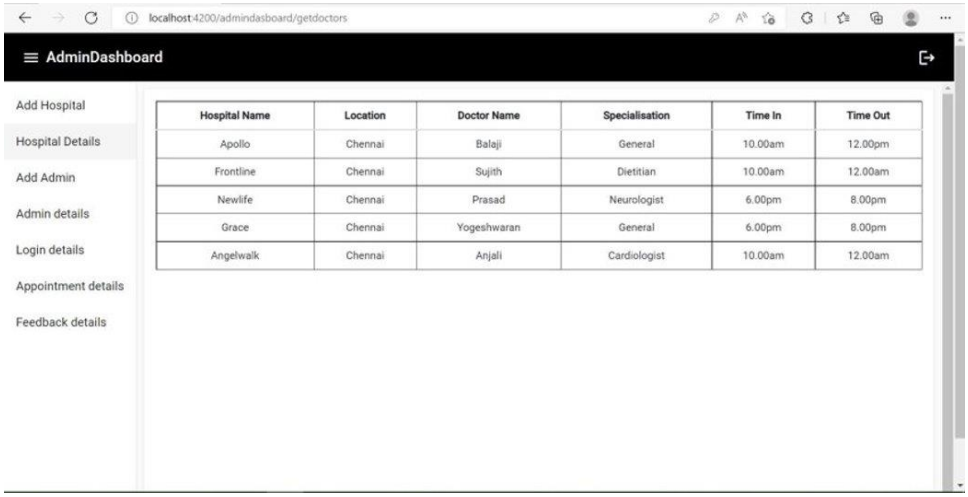

localhost:4200/userdaseboard/doctoravailability
+PharHelp
Home
Doctor Schedule
Appointment Booking
Booking History
Hospital Name
Doctor Name
Location
Booked Date
Booked Timing
Booked Slots
Apollo
Jagan-Neurologist
Chennai
2022-10-31
Morning - 10am-12pm
Slot 2- 10.20am-10.40am

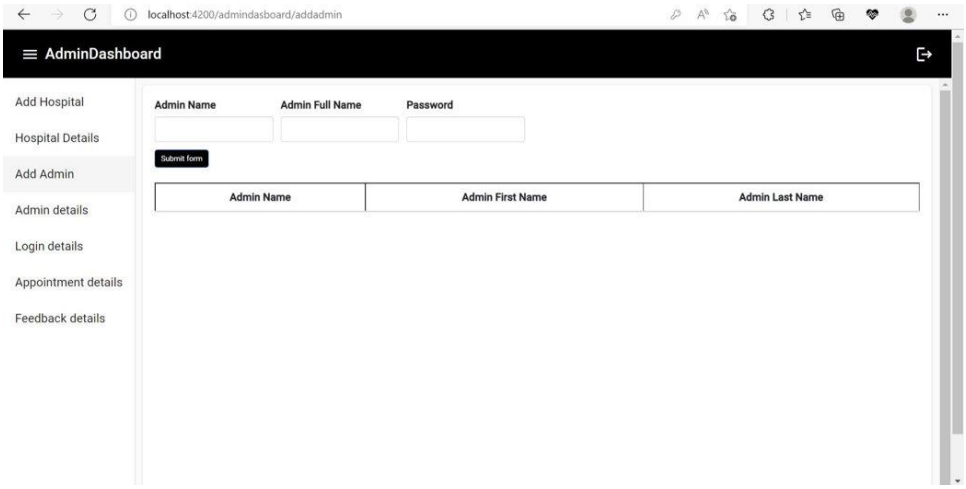

localhost:4200/userdaseboard/appointmentbooking
+PharHelp
Home
Doctor Schedule
Appointment Booking
Booking History
Book Your Appointment
*Check the Availability of Doctors from Doctor Schedule Page before Booking Medical Appointments*
Username :
Hospital Name :
Doctor Name :
Location :
Appointment Date :
dd-mm-yyyy
Booking Session :
Booking Slots :
Book
Cancel

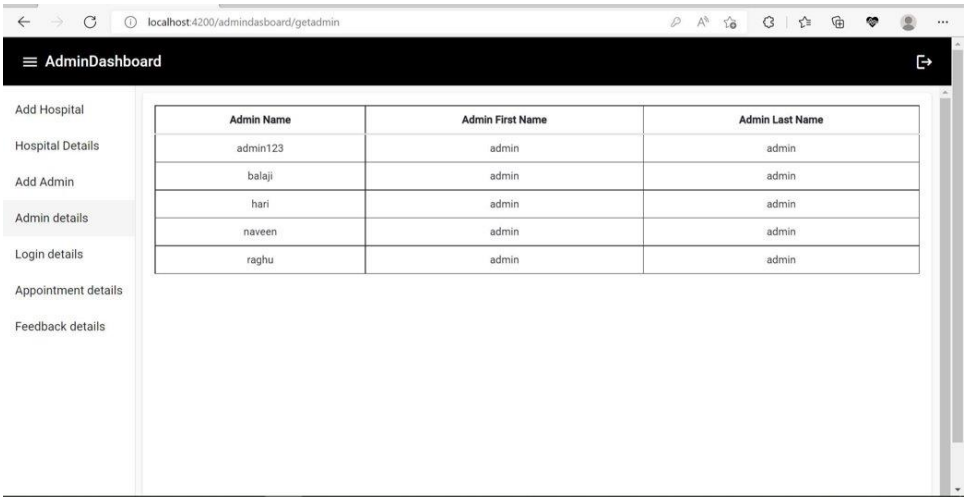

localhost:4200/userdaseboard/successpage
+PharHelp
Home
Doctor Schedule
Appointment Booking
Booking History
Your Appointment is Booked Successfully.
Home
Booking History

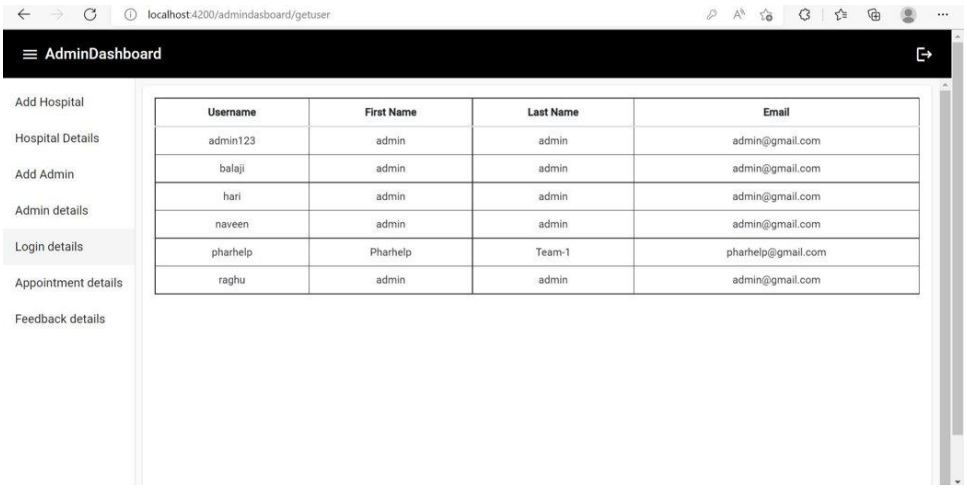
# Admin Dashboard Page:




localhost:4200/admindasboard/addadmin
AdminDashboard
Add Hospital
Hospital Details
Add Admin
Admin details
Login details
Appointment details
Feedback details
Admin Name
Admin Full Name
Password
Submit form
Admin Name
Admin First Name
Admin Last Name


localhost:4200/admindasboard/getadmin
AdminDashboard
Add Hospital
Hospital Details
Add Admin
Admin details
Login details
Appointment details
Feedback details
Admin Name
Admin First Name
Admin Last Name
admin123 admin admin
balaji admin admin
hari admin admin
naveen admin admin
raghu admin admin


localhost:4200/admindasboard/getuser
AdminDashboard
Add Hospital
Hospital Details
Add Admin
Admin details
Login details
Appointment details
Feedback details
Username
First Name
Last Name
Email
admin123
admin
admin
admin@gmail.com
balaji
admin
admin
admin@gmail.com
hari
admin
admin
admin@gmail.com
naveen
admin
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admin@gmail.com
pharhelp
Pharhelp
Team-1
pharhelp@gmail.com
raghu
admin
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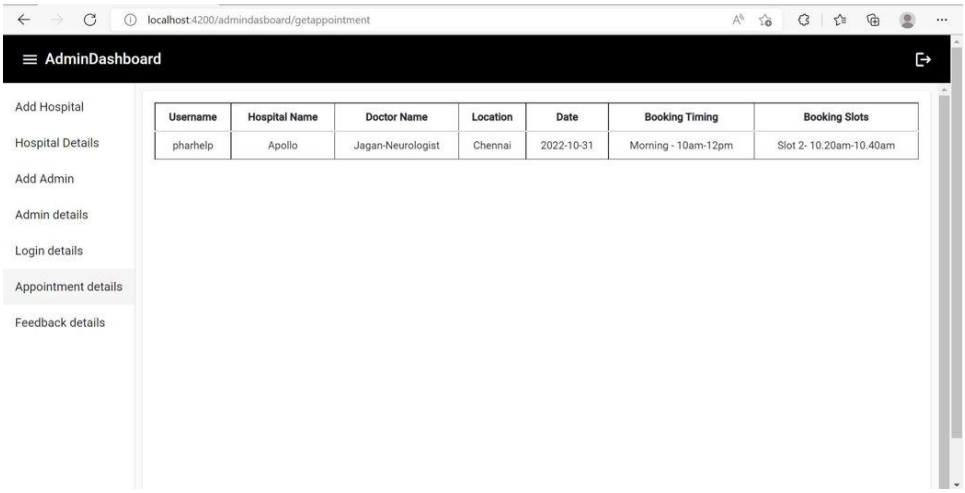
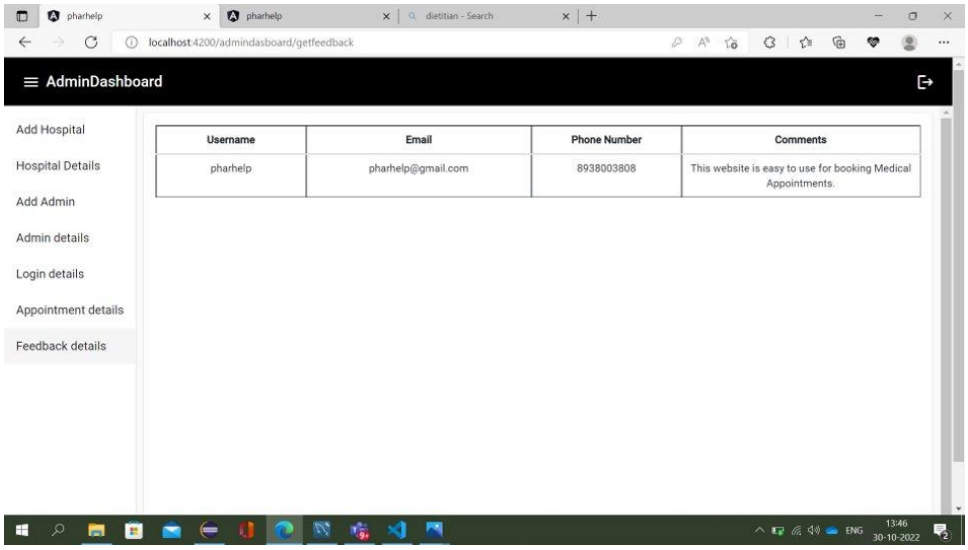
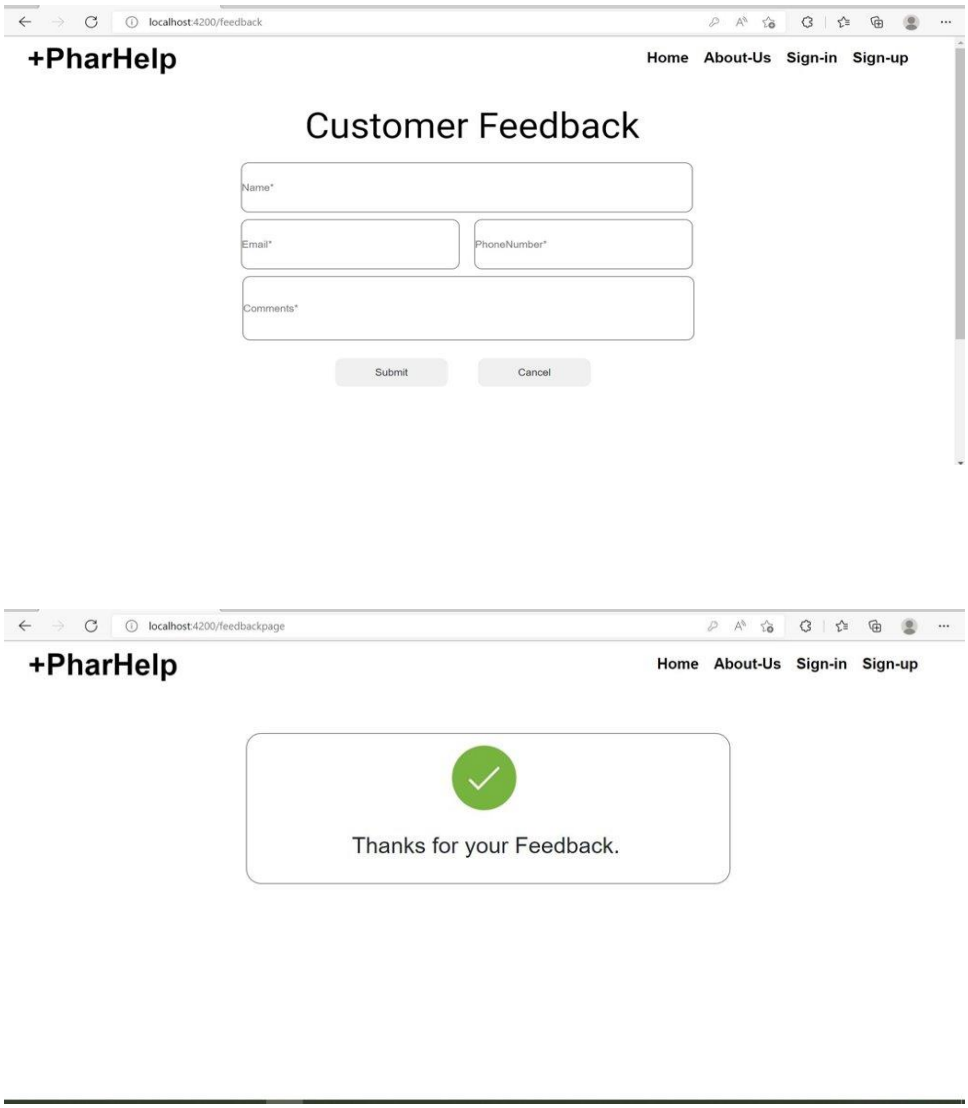
admin@gmail.com


localhost:4200/admindasboard/getappointment
AdminDashboard
Add Hospital
Hospital Details
Add Admin
Admin details
Login details
Appointment details
Feedback details
Username
Hospital Name
Doctor Name
Location
Date
Booking Timing
Booking Slots
pharhelp
Apollo
Jagan-Neurologist
Chennai
2022-10-31
Morning - 10am-12pm
Slot 2- 10.20am-10.40am


pharhelp
pharhelp
dietitian - Search
localhost:4200/admindasboard/getfeedback
AdminDashboard
Add Hospital
Hospital Details
Add Admin
Admin details
Login details
Appointment details
Feedback details
Username
Email
Phone Number
Comments
pharhelp
pharhelp@gmail.com
8938003808
This website is easy to use for booking Medical Appointments.
ENG
13:46
30-10-2022

# Feedback Page:



## Conclusion :

+Pharhelp is a helpful technology that gives the user access to business and companies all over the world. With an appointment system, the hospital can control and steer the flow of patients away from peak hours to less busy parts of the day. Some non-urgent patients can schedule their consultation in advance. As this eliminates wait times upon arrival, it has a significant impact on the patient experience. the patient can better plan their day as it eliminates the uncertainty of waiting times .It reduces the pressure and confusion among the working environment. Patients can book themselves in to different services in advance, it becomes much easier to plan ahead. The online booking dashboard will have a clear indication of how many appointments are arranged for each service day-by-day, so staff can plan and distribute resources accordingly.