

# **DATABASE MANAGEMENT SYSTEMS LAB**

## **Assignment: 4**

### **Web Application Development for Hospital Management System**

#### **Group PHOENIX**

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# INTRODUCTION

The healthcare industry is constantly evolving, and technological advancements have become integral to improving the quality of patient care. A Hospital Management System (HMS) is an essential tool for healthcare providers, enabling them to streamline their operations and improve patient outcomes. Web application development has revolutionized the way healthcare providers manage patient care and operational workflows.

This report provides complete information of the system including the schemas, technologies used, requirements and web interface.

## DATABASE SCHEMA / CLASSES

### Class Doctor:

```
class Doctor(models.Model):
    user=models.OneToOneField(User,on_delete=models.CASCADE)
    profile_pic=
models.ImageField(upload_to='profile_pic/DoctorProfilePic/',null=True,blank=True)
    address = models.CharField(max_length=40)
    mobile = models.CharField(max_length=20,null=True)
    department=
models.CharField(max_length=50,choices=departments,default='Cardiologist')
```

Each instance will have a unique ID (user) and the features include profile pic, address (char of max length 40), mobile (char of max length 20 and could be null/empty) , department (char of max length 50 and default set to 'Cardiologist'). Here the departments refers to list of all possible departments:

```
departments=[('Cardiologist','Cardiologist'),
('Dermatologists','Dermatologists'),
('Emergency Medicine Specialists','Emergency Medicine Specialists'),
('Allergists/Immunologists','Allergists/Immunologists'),
('Anesthesiologists','Anesthesiologists'),
('Colon and Rectal Surgeons','Colon and Rectal Surgeons')
]
```

## Class Patient:

```
user=models.OneToOneField(User,on_delete=models.CASCADE)
profile_pic=
models.ImageField(upload_to='profile_pic/PatientProfilePic/',null=True,blank=True)
address = models.CharField(max_length=40)
mobile = models.CharField(max_length=20,null=False)
symptoms = models.CharField(max_length=100,null=False)
assignedDoctorId = models.PositiveIntegerField(null=True)
admitDate=models.DateField(auto_now=True)
status=models.BooleanField(default=False)
```

Each patient is assigned a doctor and is linked by the doctor ID. Contains patient describing fields like symptoms, admitDate.

## Class Appointment:

```
class Appointment(models.Model):
    Regular=1
    Emergency=2

    PRIOR=[
        (Regular, 'Regular'), (Emergency, 'Emergency'),
```

```
]

patientId=models.PositiveIntegerField(null=True)
doctorId=models.PositiveIntegerField(null=True)
patientName=models.CharField(max_length=40,null=True)
doctorName=models.CharField(max_length=40,null=True)
appointmentDate=models.DateTimeField(null=True)
description=models.TextField(max_length=500)
status=models.BooleanField(default=False)
priority=models.IntegerField(choices=PRIOR, null=True)
room = models.CharField(max_length=15, null=True)
```

Every instance of appointment has fields patientID, doctorID which links the appointment to a patient and a doctor.

Also has some self-describing fields like appointmentDate, description, etc.

## Class Test:

```
class Test(models.Model):
    patientId=models.PositiveIntegerField(null=True)
    doctorId=models.PositiveIntegerField(null=True)
    patientName=models.CharField(max_length=40,null=True)
    doctorName=models.CharField(max_length=40,null=True)
    testDate=models.DateField(auto_now=True)
    testName=models.CharField(max_length=40,null=True)
    testResult=models.CharField(max_length=40,null=True)
```

The Test class refers to the tests prescribed by doctor to a patient and hence patientID and DoctorID in the fields. And other important fields like testDate, testName (test Names are unique), etc.

## Class Treatment:

```
class Treatment(models.Model):
    patientId=models.PositiveIntegerField(null=True)
    doctorId=models.PositiveIntegerField(null=True)
    patientName=models.CharField(max_length=40,null=True)
    doctorName=models.CharField(max_length=40,null=True)
```

```
treatmentDate=models.DateField(auto_now=True)
treatmentName=models.CharField(max_length=40,null=True)
description=models.TextField(max_length=500)
```

The Treatment class refers to the treatment a patient is undergoing as prescribed by the doctor and hence has patientID and doctorID fields.

## Class PatientDischargeDetails:

```
class PatientDischargeDetails(models.Model):
    patientId=models.PositiveIntegerField(null=True)
    patientName=models.CharField(max_length=40)
    assignedDoctorName=models.CharField(max_length=40)
    address = models.CharField(max_length=40)
    mobile = models.CharField(max_length=20,null=True)
    symptoms = models.CharField(max_length=100,null=True)

    admitDate=models.DateField(null=False)
    releaseDate=models.DateField(null=False)
    daySpent=models.PositiveIntegerField(null=False)

    roomCharge=models.PositiveIntegerField(null=False)
    medicineCost=models.PositiveIntegerField(null=False)
    doctorFee=models.PositiveIntegerField(null=False)
    OtherCharge=models.PositiveIntegerField(null=False)
    total=models.PositiveIntegerField(null=False)
```

When a patient is getting discharged, the room charges, medicinal expenses, doctor fees are all calculated for the payment. Also, the details of the stay like date of admission, date of release, days spent are all recorded.

## Class Room:

```
class Room(models.Model):
    room_no=models.CharField(max_length=15)
    curr_availability=models.PositiveIntegerField()
    max_capacity=models.PositiveIntegerField()
```

Each room has a unique room\_no. Each room has some maximum capacity max\_capacity and current slots left in the room is the curr\_availability.

## **TECHNOLOGY**

Python language is used for the overall implementation of the project. And Django (Python based) is used as the high-level web framework.

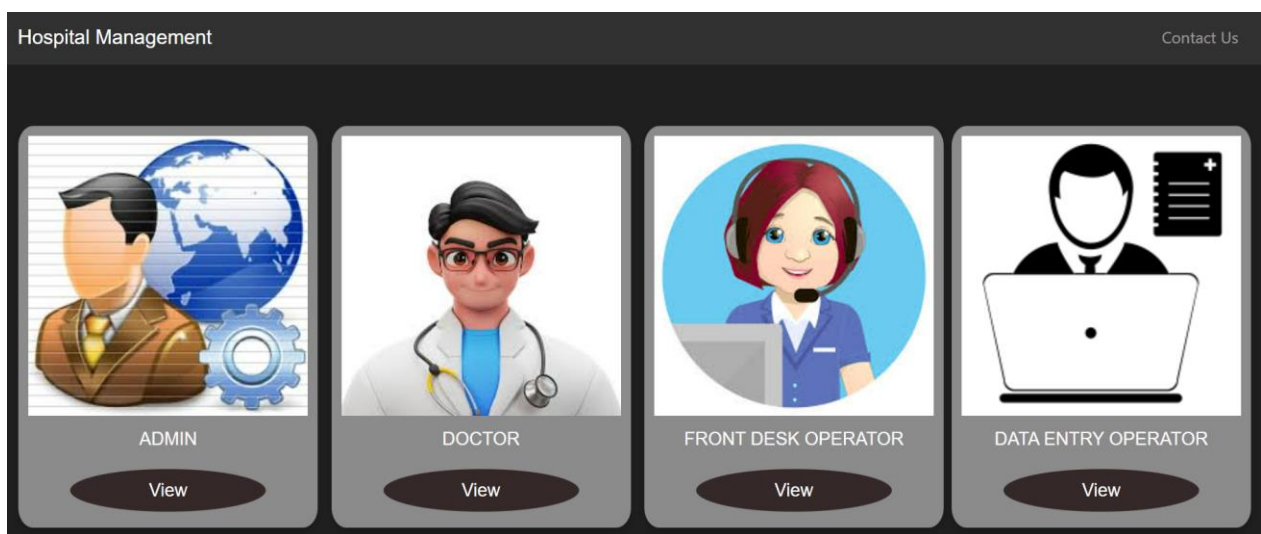
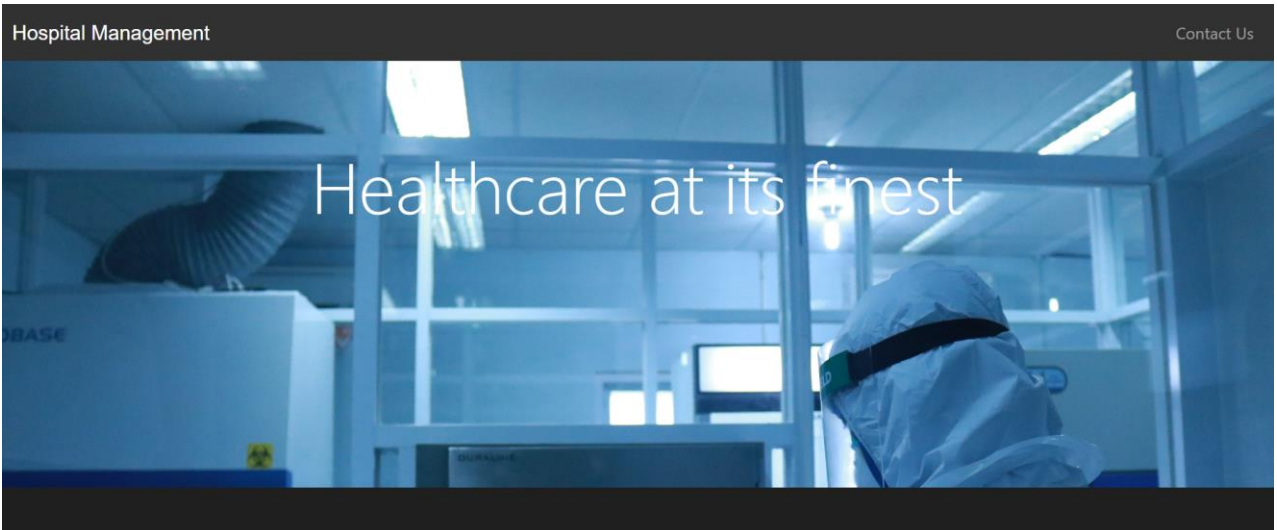
For the front end of the web application, HTML, CSS and Javascript are used.

Libraries used are mentioned in the requirements.txt file.

Can be run in both Windows and Linux operating system.

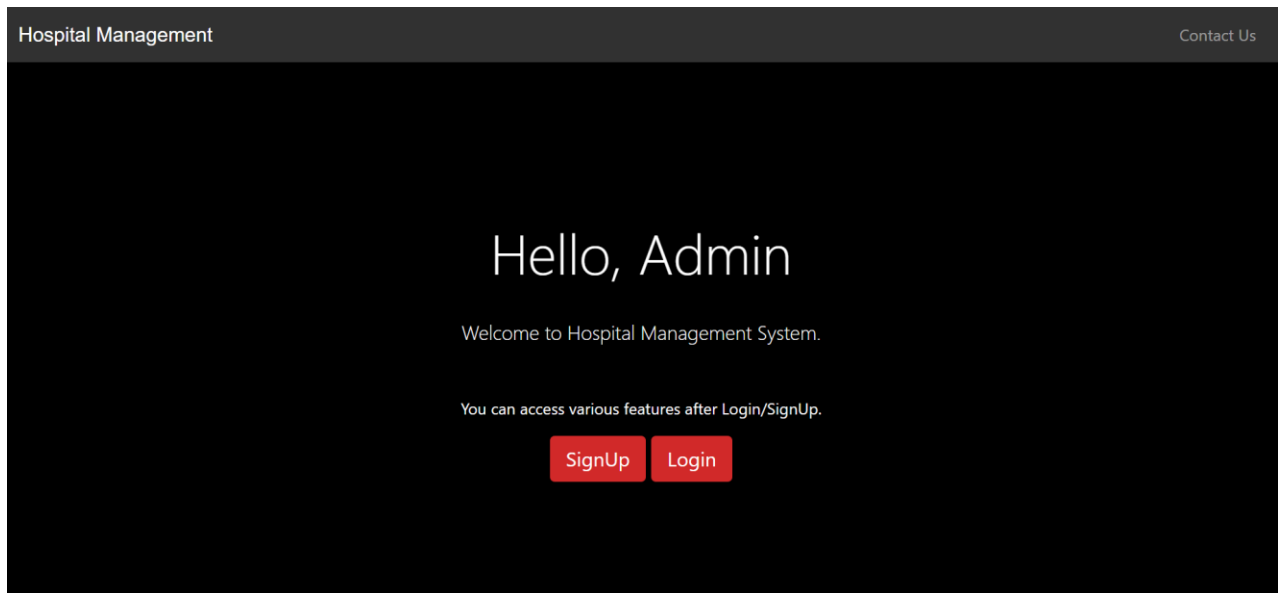
## **WEB INTERFACE:**

- **Home page**



- **Admin**

The administrator has the most control and can register, update, or delete users and accommodate rooms by clicking appropriate links on the sidebar.



## ➤ Signup:

Admin can signup here by filling the required details and setting a password.

A screenshot of a web application titled "Hospital Management" in the top left corner and "Contact Us" in the top right corner. The main content area has a dark background. A red rectangular banner at the top of the form area contains the text "Add New Admin To Hospital" in white. Below the banner is a white-bordered box containing four input fields: "First Name", "Last Name", "Username", and "Password". Below these fields is a red rounded rectangular button with the text "Submit". At the bottom of the white-bordered box, there is a link that says "Already have an account? [Login here](#)".

## ➤ Login:



Admin can login from here by filling the username and password.

Hospital ManagementContact Us


Admin Login Page

Login

Do not have account? [Signup here](#)

## ➤ Dashboard:

This is the dashboard of an administrator containing information like the total users, recent records and the required links on the sidebar.

  
Admin

Admin

Dashboard

Doctor

Front Desk Operator


Data Entry Operator

Rooms


HOSPITAL MANAGEMENT

Logout


3  
Total Doctor  
Approval Required : 0



2  
Total Patient  
Wants to Admit : 0



2  
Total Appointment  
Approve Appointments : 0

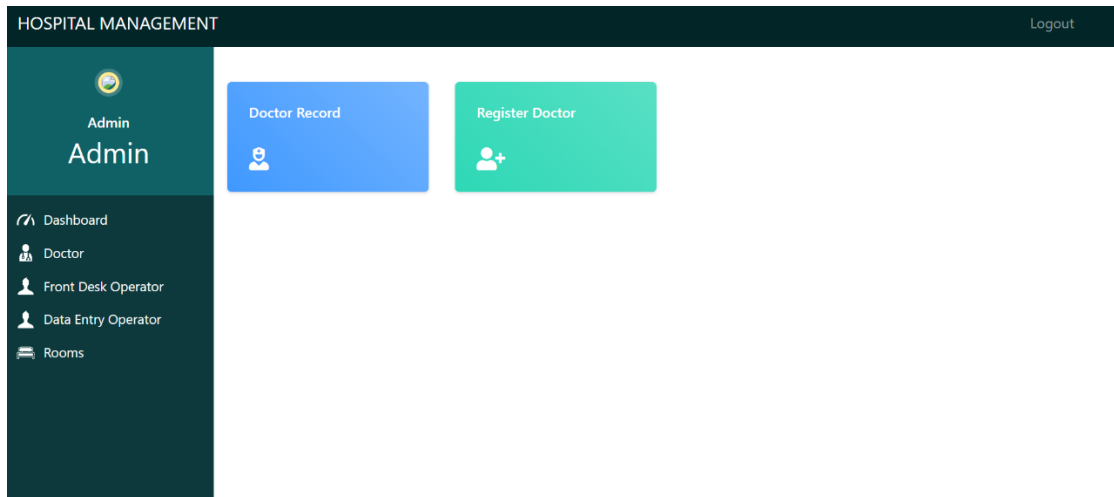


Recent Doctors		
Name	Department	Mobile
Arun A K	Cardiologist	9874321987
Dr. Tanmay Mohanty	Emergency Medicine Specialists	1234567890
Dr. Rushil Venkateshwar	Dermatologists	1234567890

## ➤ Doctor Records/Registration:

Doctor records can be viewed, updated, deleted and registered from here.

Homepage > Admin > login > Doctor



Homepage > Admin > login > Doctor > Doctor Record

The screenshot shows the 'HOSPITAL MANAGEMENT' Admin interface with the 'Doctor Record' button selected. The main content area displays a table titled 'Doctors' with the following data:

Name	Profile Picture	Mobile	Address	Department	Update	Delete
Dr. Rushil Venkateshwar		1234567890	LBS	Dermatologists		
Dr. Tanmay Mohanty		1234567890	LBS	Emergency Medicine Specialists		
Arun A K		9874321987	RP	Cardiologist		


Doctor records can be updated and deleted from here

Below is the record updating form:

Homepage > Admin > Login > Doctor > Doctor Record > Update

HOSPITAL MANAGEMENT

Logout



Admin

Admin

Dashboard

Doctor

Front Desk Operator

Data Entry Operator

Rooms

Update Doctor Details

Dr. Tanmay

Mohanty

Username

Password

Mobile

Address

Cardiologist

Currently: [profile\\_pic/DoctorProfilePic/Draft2\\_S5sR89g.png](#) ☐ Clear

Change:

Browse...

No file selected.


Update

Below is the Doctor Registration form:

Homepage > Admin > Login > Doctor > Register Doctor

HOSPITAL MANAGEMENT

Logout



Admin

Admin

Dashboard

Doctor

Front Desk Operator

Data Entry Operator

Rooms

Add New Doctor To Hospital

First Name

Last Name

Username

Password

Email ID

Mobile

Cardiologist

Browse...

No file selected.

Address

Register

➤ **Front Desk Operator Records/Registration:**

Front Desk Operator records can be viewed, deleted and registered from here as done in the Doctor.

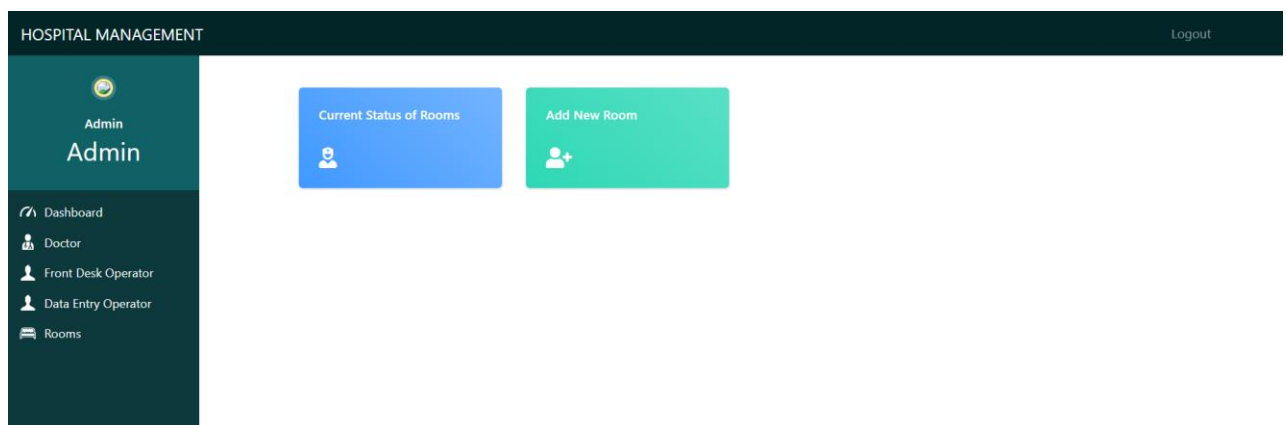
➤ **Data Entry Operator Records/Registration:**

Data Entry Operator records can be viewed, deleted, and registered from here as done in the Doctor.

➤ **Rooms:**

Records of rooms can be accessed from here and also new rooms can be added giving their details.

Homepage > Admin > Login > Rooms



Homepage > Admin > Login > Doctor > Rooms > Current Status of Room

HOSPITAL MANAGEMENT			Logout
<div>Admin</div> <div>Admin</div> <ul style="list-style-type: none"> <li>Dashboard</li> <li>Doctor</li> <li>Front Desk Operator</li> <li>Data Entry Operator</li> <li>Rooms</li> </ul>	Rooms		
	Room No.	Max Capacity	Current Availability
	B311	10	10

This gives a list of all rooms and their current Availability.

## New Room form:

Homepage > Admin > Login > Doctor > Rooms > Add new room

HOSPITAL MANAGEMENT			Logout
<div>Admin</div> <div>Admin</div> <ul style="list-style-type: none"> <li>Dashboard</li> <li>Doctor</li> <li>Front Desk Operator</li> <li>Data Entry Operator</li> <li>Rooms</li> </ul>	Add New Room		
	Room Number	Current Availability	
	Maximum Capacity		
	Register		

Unique room number, its availability, maximum capacity can be filled and registered.

- **Doctor**

### ➤ Login:

Homepage > Doctor > Login


Hospital ManagementContact Us

Doctor Login Page

Login

## ➤ Dashboard:

Homepage > Doctor > Login > Dashboard



Doctor

Dr. Tanmay

- Dashboard
- Patient
- Appointments

HOSPITAL MANAGEMENTLogout

0  
Appointments For You

1  
Patient Under You

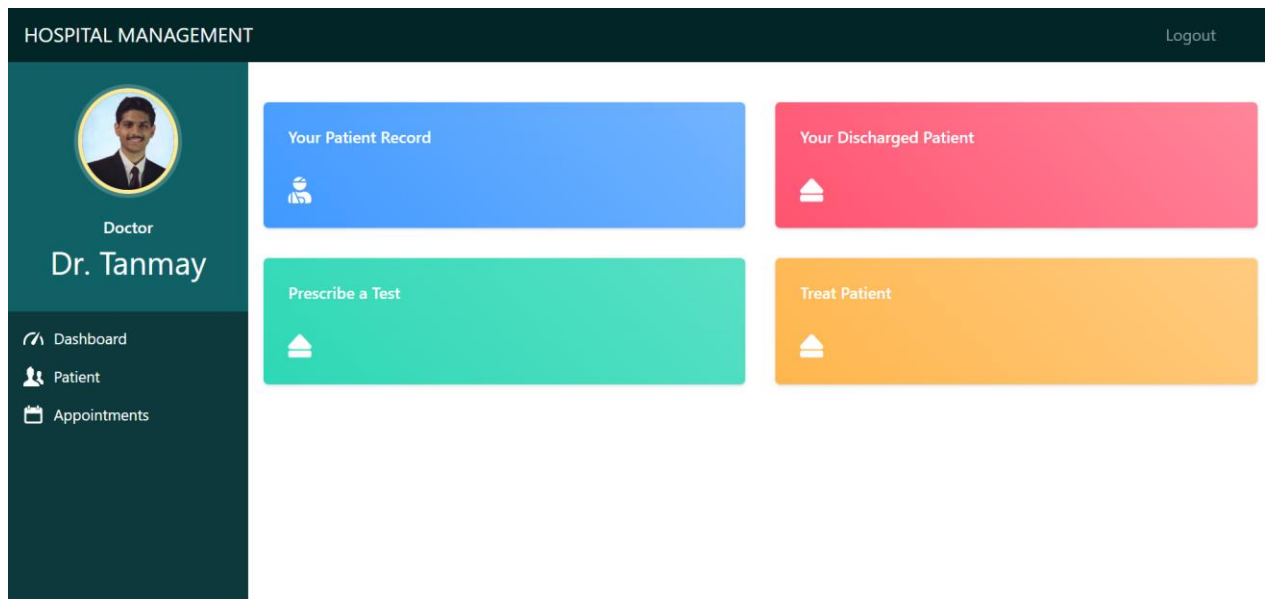
0  
Your Patient Discharged

Recent Appointments For You					
Patient Name	Picture	Description	Mobile	Address	Date

The above dashboard contains some quick information and the required links.

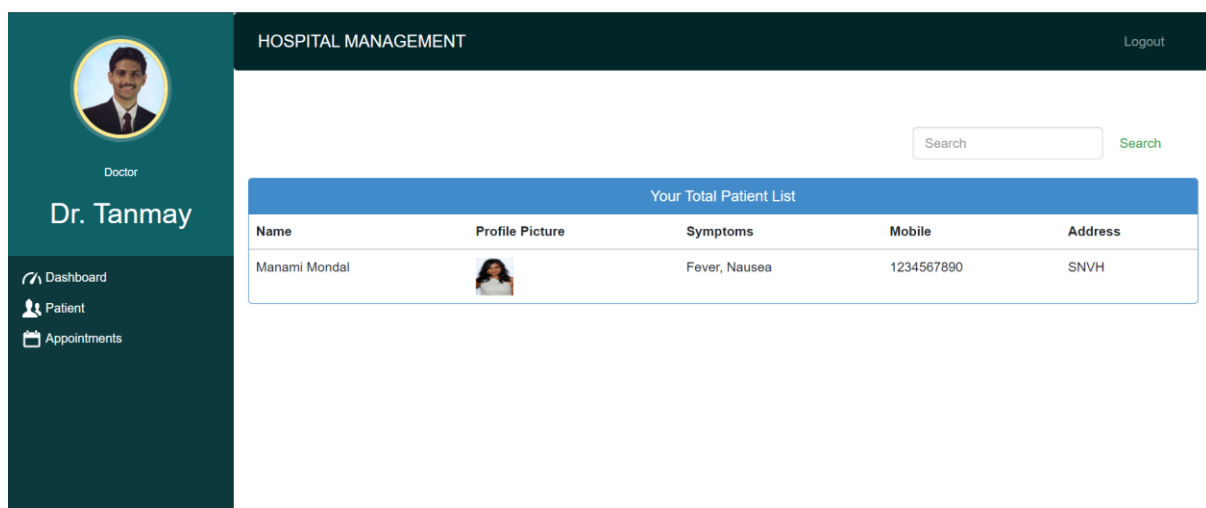
## ➤ Patient:

Homepage > Doctor > Login > Patient



Features related to patient records, discharged patients, prescribing a test and treatment can be accessed from here.

Homepage > Doctor > Login > Patient > Your Patient Record



Homepage > Doctor > Login > Patient > Prescribe a test

The screenshot shows the 'Update Test Details' form. On the left is a dark teal sidebar with the 'HOSPITAL MANAGEMENT' header, a 'Logout' link, and a user profile for 'Doctor Dr. Tanmay'. The sidebar contains navigation links for 'Dashboard', 'Patient', and 'Appointments'. The main content area has a blue header 'Update Test Details' and a white form with the following fields: 'Test Name' (text input), 'Test Result' (text input), 'Doctor Name and Department' (dropdown menu), and 'Patient Name and Symptoms' (dropdown menu). A blue 'Book' button is at the bottom of the form.

Here the doctor can prescribe a test and update its result.

Homepage > Doctor > Login > Patient > Treat Patient

The screenshot shows the 'Update Treatment Details' form. The layout is identical to the previous form, with a sidebar for 'Doctor Dr. Tanmay' and a main area with a blue header 'Update Treatment Details'. The form fields are: 'Treatment Name' (text input), 'Treatment Result' (a larger text input area), 'Doctor Name and Department' (dropdown menu), and 'Patient Name and Symptoms' (dropdown menu). A blue 'Book' button is at the bottom.

Here the Doctor inputs the Treatment steps taken and its results.

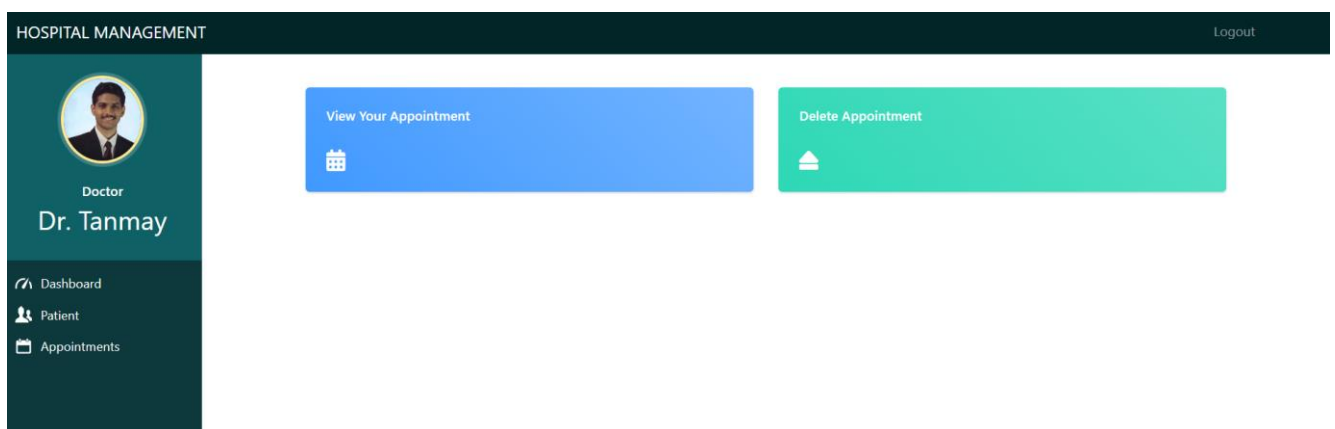
Your Discharged Patients gives the list of all discharged patients with all its details.



## ➤ **Appointments:**

Here the Doctor can view his/her appointments and delete them.

Homepage > Doctor > Login > Appointments



- **Front Desk operator**

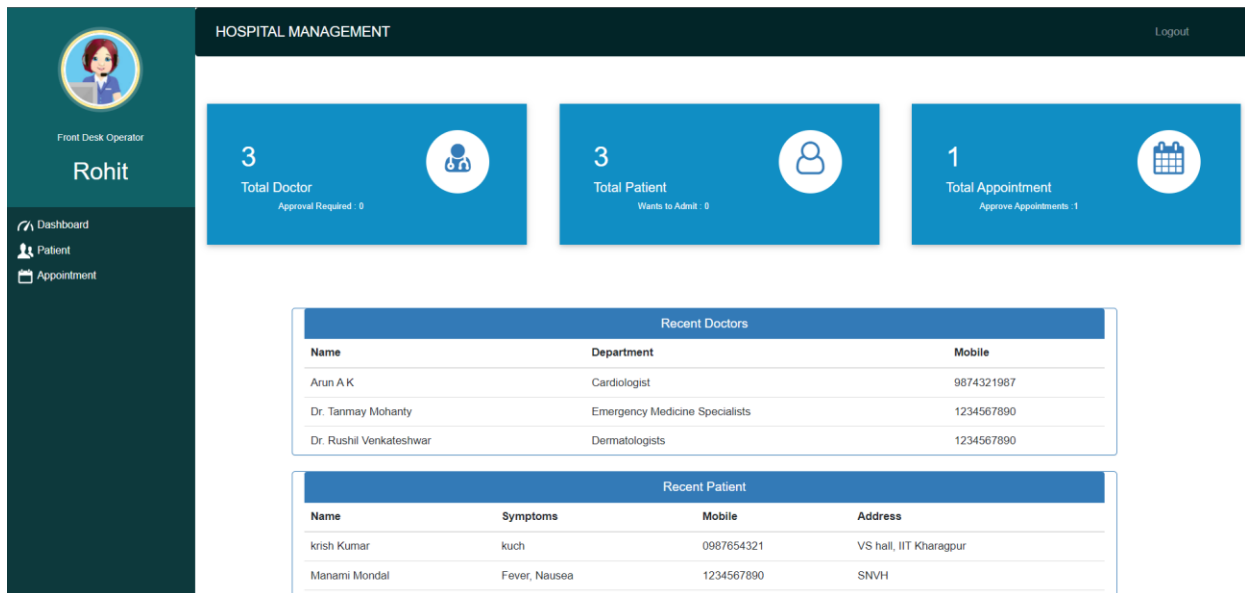
A front desk operator books and manages appointments. Also, admission and discharging of patients are managed by the front desk operator.

## ➤ **Login:**

Login similar to previously shown users using the username and the password.

## ➤ **Dashboard:**

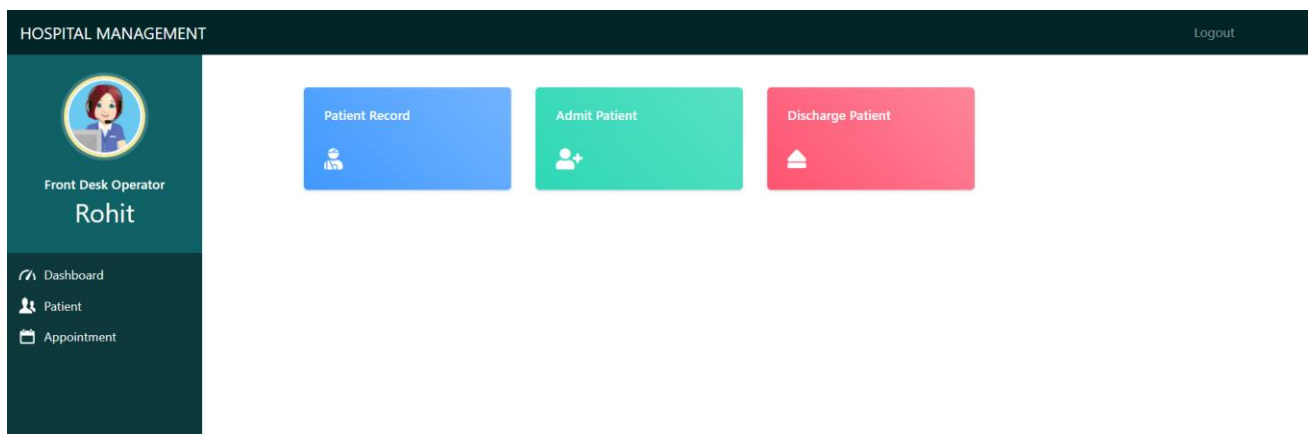
Homepage > Front Desk Operator > Login > Dashboard



As other dashboards, it gives quick information and required links on the side bar.

## ➤ Patient:

Homepage > Front Desk Operator > Login > Patient




Admit Patient form:

Homepage > Front Desk Operator > Login > Patient

HOSPITAL MANAGEMENT

Logout



Front Desk Operator  
Rohit

Dashboard

Patient

Appointment

Admit Patient To Hospital

First Name

Last Name

Username

Password

Address

Mobile

Symptoms


Name and Department

Choose File

No file chosen

Admit

Homepage > Front Desk Operator > Login > Patient > Discharge Patient



Front Desk Operator  
Rohit




Dashboard

Patient

Appointment

HOSPITAL MANAGEMENT


Logout

Discharge Patient			
Name	Symptoms	Mobile	Discharge
Sarita Singh	Skin consultation	1236789026	
Manami Mondal	Fever, Nausea	1234567890	
krish Kumar	kuch	0987654321	

Patient Discharge form:

Homepage > Front Desk Operator > Login > Patient > Discharge Patient > Discharge

HOSPITAL MANAGEMENT Logout



Front Desk Operator  
**Rohit**

- Dashboard
- Patient
- Appointment

## Hospital Management

Admit Date: March 9, 2023  
Release Date: March 12, 2023  
Days Spent: 3

Patient Name : Manami Mondal  
Patient Mobile : 1234567890  
Patient Address : SNVH

Doctor Name :  
Dr. Tanmay

**Disease and Symptoms**  
Fever, Nausea


Item	Price
Room Charge (Per Day)	<input type="text" value="In Rupees"/>
Doctor Fee	<input type="text" value="In Rupees"/>
Medicine Cost	<input type="text" value="In Rupees"/>
Other Charge	<input type="text" value="In Rupees"/>

[Generate Bill](#)

All the details of individual expenses are filled and the bill can be generated.

Homepage > Front Desk Operator > Login > Patient > Discharge Patient > Discharge > Generate Bill

HOSPITAL MANAGEMENT 80% — + [Reset](#) Logout



Front Desk Operator  
**Rohit**

- Dashboard
- Patient
- Appointment

## Hospital Management

Admit Date: March 9, 2023  
Release Date: March 12, 2023  
Days Spent: 3

Patient Name : Manami Mondal  
Patient Mobile : 1234567890  
Patient Address : SNVH

Doctor Name :  
Dr. Tanmay

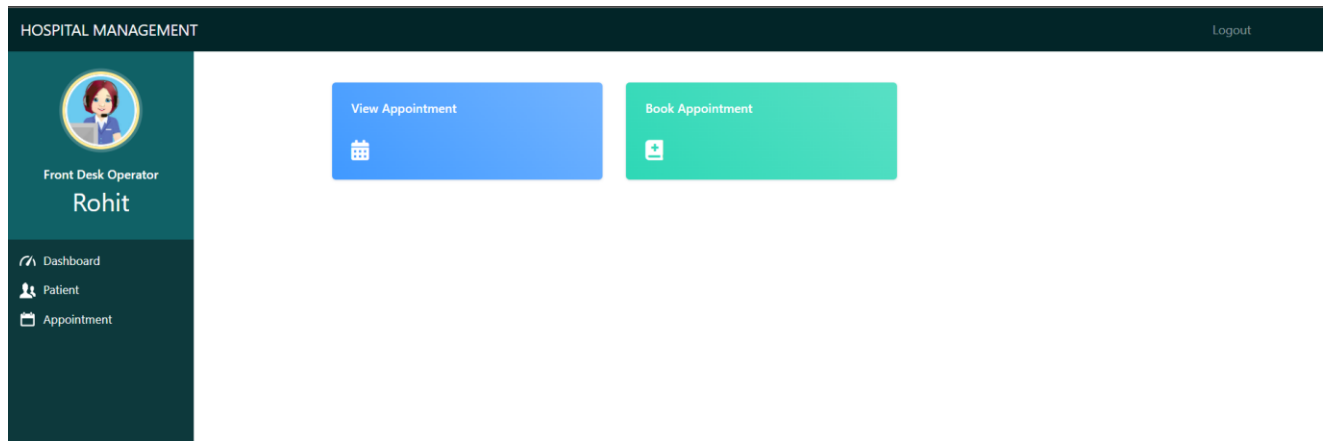
**Disease and Symptoms**  
Fever, Nausea

Item	Price
Room Charge of 3 Days	66
Doctor Fee	32
Medicine Cost	21
Other Charge	32
<b>Total Rupees : 151</b>	

[Download](#)

The total generated bill including all the details of the patient's discharge can be downloaded from here.

## ➤ Appointments:



Appointments can be viewed and booked from here.

### Book appointment form:

Homepage > Front Desk Operator > Login > Appointments > Book Appointment

The 'Book Appointment Details' form is displayed. It includes a sidebar for the user 'Rohit' and a top navigation bar. The form fields are as follows:

- Symptoms:** A text input field containing 'Fever, cold, cough'.
- Calendar:** A date picker showing 'March, 2023'. The date '08' is selected. The time is set to '09 AM'.
- Doctor:** A dropdown menu with 'Dr. Tanmay (Emergency Medicine Specialists)' selected.
- Patient Name and Symptoms:** A dropdown menu.
- Room for Appointment:** A dropdown menu.
- Buttons:** 'Check' and 'Book' buttons at the bottom.

Here an appointment can be booked by filling in the details like symptoms, doctor specialization, etc and can select the appointment date by the calendar.

Finally, the availability can be checked and the appointment can be booked successfully.

- **Data Entry Operator**

A Data Entry Operator can update data related to tests and treatments

➤ **Login:**

Login by username and password.

➤ **Dashboard:**

Homepage > Data Entry Operator > Login > Dashboard

The screenshot shows the 'HOSPITAL MANAGEMENT' dashboard for a 'Data Entry Operator' named 'Devendra'. The dashboard includes a sidebar with navigation links: Dashboard, Update Test, and Update Treatment. The main content area features three summary cards: '3 Total Doctor' (Approval Required: 0), '3 Total Patient' (Wants to Admit: 0), and '1 Total Appointment' (Approve Appointments: 1). Below these cards are two tables: 'Recent Doctors' and 'Recent Patient'.

Recent Doctors		
Name	Department	Mobile
Arun A K	Cardiologist	9874321987
Dr. Tanmay Mohanty	Emergency Medicine Specialists	1234567890
Dr. Rushil Venkateshwar	Dermatologists	1234567890

Recent Patient			
Name	Symptoms	Mobile	Address
krish Kumar	kuch	0987654321	VS hall, IIT Kharagpur
Manami Mondal	Fever, Nausea	1234567890	SNVH

➤ **Updating Tests:**

The test results can be updated from here from the list of all tests currently prescribed. Also the

test results could be mailed to the patient's registered email id.

Homepage > Data Entry Operator > Login > Update Test

The screenshot displays the 'HOSPITAL MANAGEMENT' interface. On the left, a sidebar identifies the user as 'Data Entry Operator Devendra' and lists navigation options: 'Dashboard', 'Update Test', and 'Update Treatment'. The main content area features a table titled 'Tests' with columns for Patient Name, Doctor Name, Test Name, Date, Update, and Send Email. Two test records are listed: one for 'Manami' (Blood Cholesterol) and one for 'krish' (ECG), both dated March 9, 2023. Each record has 'Update' and 'Send Email' buttons.

Patient Name	Doctor Name	Test Name	Date	Update	Send Email
Manami	Dr. Tanmay	Blood Cholesterol	March 9, 2023		
krish	Arun	ECG	March 9, 2023		

### ➤ Update Treatments:

The data entry operator can also update treatments the patients are undergoing, from here.

**There can be many other features seen, like search bar for searching a particular record from a list, contact us feature, etc.**