Database Management Systems Laboratory

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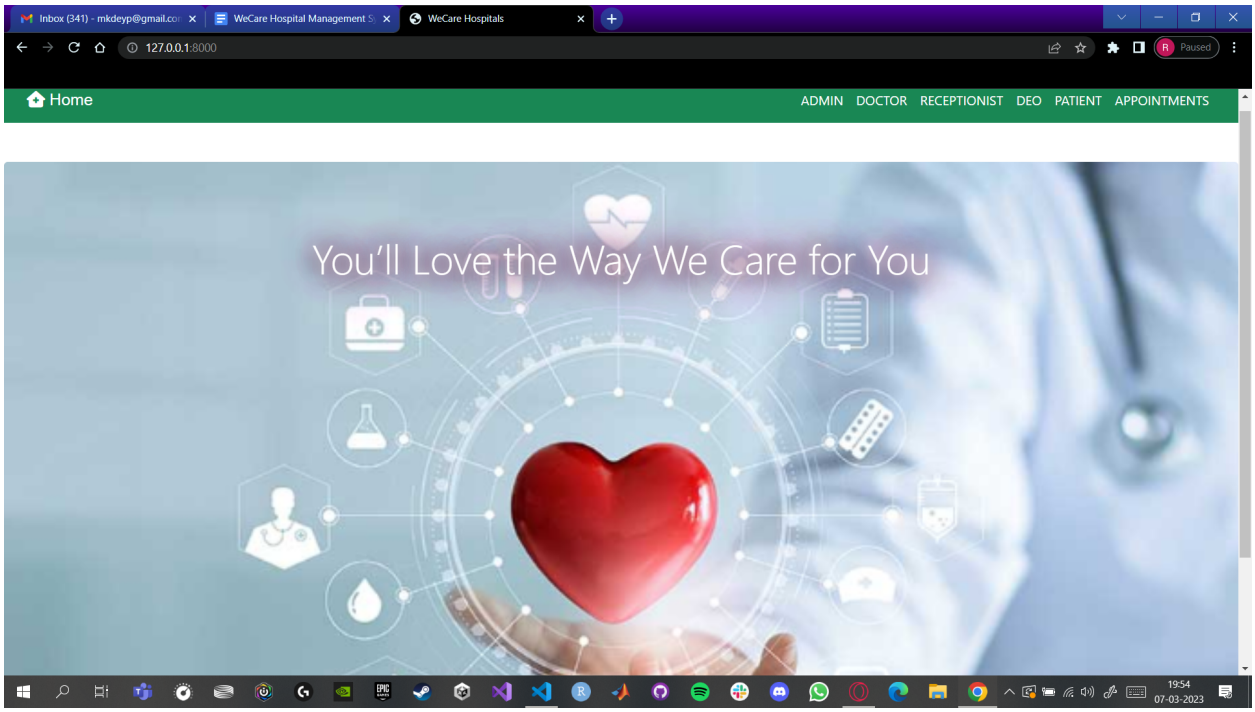
WeCare Hospitals Management System



Database schemas and characteristics of our System:-

1) Schema for database administrator:

```
auth_user (

  id integer NOT NULL PRIMARY KEY AUTOINCREMENT,

  password varchar(128) NOT NULL,

  last_login datetime NULL,

  is_superuser bool NOT NULL,

  username varchar(150) NOT NULL UNIQUE,

  first_name varchar(30) NOT NULL,
```

```
  last_name varchar(30) NOT NULL,
  email varchar(254) NOT NULL,
  is_staff bool NOT NULL,
  is_active bool NOT NULL,
  date_joined datetime NOT NULL,
  CONSTRAINT
auth_user_username_2e2e9cfde2e5e35a3e3a78e59e7b6141_uniq UNIQUE
(username)
);
```

The auth_user entity represents a database administrator for the hospital.The entity represents the user accounts and their authentication in the system.

Here is a brief overview of the table columns:

- **id**: A unique integer identifier for each user account, which is automatically incremented with each new account created.
- **password**: A hashed representation of the user's password, which is stored securely in the database.
- **last_login**: The date and time of the user's last successful login, or NULL if the user has never logged in.
- **is_superuser**: A boolean value indicating whether the user has superuser privileges (i.e., administrative access to the system).
- **username**: The unique username chosen by the user to identify their account.
- **first_name**: The user's first name.
- **last_name**: The user's last name.

- **email**: The user's email address.
- **is_staff**: A boolean value indicating whether the user is a staff member (i.e., has access to administrative tools).
- **is_active**: A boolean value indicating whether the user's account is active (i.e., they can log in).
- **date_joined**: The date and time the user's account was created.

Additionally, we have added a unique constraint on the username column to ensure that each username is unique within the table.

2) Schema for Doctor:

```
doctor (

    id INT PRIMARY KEY AUTO_INCREMENT,

    user_id INT NOT NULL UNIQUE,

    profile_pic VARCHAR(255),

    address VARCHAR(40) NOT NULL,

    mobile VARCHAR(20),

    department VARCHAR(50) NOT NULL,

    status BOOLEAN DEFAULT FALSE,

    FOREIGN KEY (user_id) REFERENCES user(id)

);

ALTER TABLE doctor ADD COLUMN name VARCHAR(255) GENERATED ALWAYS AS
(CONCAT((SELECT first_name FROM user WHERE id=user_id), ' ', (SELECT
last_name FROM user WHERE id=user_id))) STORED;
```

The doctor entity represents doctors or medical professionals affiliated in a healthcare system.

Here is a brief overview of the table columns:

- **id**: A unique integer identifier for each doctor, which is automatically incremented with each new doctor added.
- **user_id**: The unique identifier of the user associated with this doctor, likely a foreign key referencing the id column of a user table.
- **profile_pic**: The filename or URL of an image file representing the doctor's profile picture.
- **address**: The doctor's address, which is required.
- **mobile**: The doctor's mobile number.
- **department**: The department or area of expertise the doctor is associated with, which is required.
- **status**: A boolean value indicating whether the doctor is currently available or not, with a default value of FALSE.
- **FOREIGN KEY (user_id) REFERENCES user(id)**: A foreign key constraint that references the id column of the user table, which likely stores information about users of the healthcare system.

Additionally, the last statement adds a new column to the **doctor** table called **name**, which will always contain the concatenated value of the first and last name of the user associated with the doctor, stored as a computed column in the table.

3) Schema for Data entry operator:

```
deo (

    id INT PRIMARY KEY AUTO_INCREMENT,

    user_id INT NOT NULL UNIQUE,

    address VARCHAR(40),

    mobile VARCHAR(20),

    status BOOLEAN DEFAULT FALSE,

    FOREIGN KEY (user_id) REFERENCES user(id)

);

ALTER TABLE deo ADD COLUMN name VARCHAR(255) GENERATED ALWAYS AS
(CONCAT((SELECT first_name FROM user WHERE id=user_id), ' ', (SELECT
last_name FROM user WHERE id=user_id))) STORED;
```

The deo entity represents Data Entry Operators (DEOs) in our healthcare system who are members of the hospital management staff and responsible for scheduling tests/treatments for the patients, updating the test/treatment results after completion, and adding patients' health records as per requirements.

Here is a brief overview of the table columns:

- **id**: A unique integer identifier for each DEO, which is automatically incremented with each new DEO added.
- **user_id**: The unique identifier of the user associated with this DEO, likely a foreign key referencing the id column of a user table.
- **address**: The DEO's address.

- **mobile**: The DEO's mobile number.
- **status**: A boolean value indicating whether the DEO is currently available or not, with a default value of FALSE.
- **FOREIGN KEY (user_id) REFERENCES user(id)**: A foreign key constraint that references the **id** column of the **user** table, which stores information about users of the system.

Additionally, the last statement adds a new column to the **deo** table called **name**, which will always contain the concatenated value of the first and last name of the user associated with the DEO, stored as a computed column in the table.

4) Schema for Front Desk Operator:

```
receptionist (
    id INT NOT NULL AUTO_INCREMENT,
    user_id INT NOT NULL,
    address VARCHAR(40),
    mobile VARCHAR(20),
    PRIMARY KEY (id),
    FOREIGN KEY (user_id) REFERENCES user(id)
);
```

The receptionist entity represents the Front Desk Operators (FDOs) in our healthcare system who are the first point of contact for patients and visitors at the hospital's reception. A front-desk operator is responsible for patient registration, scheduling patient appointments, handling patients' admission/discharge, and having access to information about all patients.

Here is a brief overview of the table columns:

- **id**: A unique integer identifier for each receptionist, which is automatically incremented with each new receptionist added.
- **user_id**: The unique identifier of the user associated with this receptionist, likely a foreign key referencing the id column of a user table.
- **address**: The receptionist's address.
- **mobile**: The receptionist's mobile number.
- **PRIMARY KEY (id)**: Specifies that the id column is the primary key of the table, ensuring each row has a unique identifier.
- **FOREIGN KEY (user_id) REFERENCES user(id)**: A foreign key constraint that references the **id** column of the **user** table, which stores information about users of the system.

5) Schema for Patient:

```
patient (

    id INT PRIMARY KEY AUTO_INCREMENT,

    user_id INT NOT NULL UNIQUE,

    profile_pic VARCHAR(255),

    address VARCHAR(40) NOT NULL,

    mobile VARCHAR(20) NOT NULL,

    symptoms VARCHAR(100) NOT NULL,

    assigned_doctor_id INT,

    admit_date DATE DEFAULT CURRENT_TIMESTAMP,
```

```
    status BOOLEAN DEFAULT FALSE,
    tests VARCHAR(100) DEFAULT 'Not Treated',
    prescription VARCHAR(500) DEFAULT 'Not Treated',
    FOREIGN KEY (user_id) REFERENCES user(id),
    FOREIGN KEY (assigned_doctor_id) REFERENCES doctor(id)
);

ALTER TABLE patient ADD COLUMN name VARCHAR(255) GENERATED ALWAYS AS
(CONCAT((SELECT first_name FROM user WHERE id=user_id), ' ', (SELECT
last_name FROM user WHERE id=user_id))) STORED;
```

The patient entity represents a patient seeking treatment in the hospital. A patient can book an appointment with a doctor with the help of the front-desk operator, get their tests/treatments scheduled, and their health records updated by the data-entry operator. However, a patient is not a user of the application. It represents a passive entity for storing a patient's information.

Here is a brief overview of the table columns:

- **id**: A unique integer identifier for each patient, which is automatically incremented with each new patient added.
- **user_id**: The unique identifier of the user associated with this patient, likely a foreign key referencing the id column of a user table.
- **profile_pic**: The path to the patient's profile picture.
- **address**: The patient's address.
- **mobile**: The patient's mobile number.
- **symptoms**: A string describing the patient's symptoms.

- **assigned_doctor_id**: The ID of the doctor assigned to this patient, likely a foreign key referencing the id column of a doctor table.
- **admit_date**: The date when the patient was admitted to the hospital, with a default value of the current timestamp.
- **status**: A boolean value indicating whether the patient is still admitted or has been discharged.
- **tests**: A string describing any tests the patient has undergone or is scheduled to undergo, with a default value of "Not Treated".
- **prescription**: A string describing any medication prescribed to the patient, with a default value of "Not Treated".
- **PRIMARY KEY (id)**: Specifies that the id column is the primary key of the table, ensuring each row has a unique identifier.
- **FOREIGN KEY (user_id) REFERENCES user(id)**: A foreign key constraint that references the id column of the user table, which likely stores information about users of the system.
- **FOREIGN KEY (assigned_doctor_id) REFERENCES doctor(id)**: A foreign key constraint that references the **id** column of the **doctor** table, indicating the doctor assigned to this patient.

Additionally, the last statement adds a new computed column called **name** to the **patient** table, which is similar to the **name** column added to the **doctor** and **deo** tables. The **name** column is generated automatically based on the **first_name** and **last_name** values of the user associated with the patient.

6) Schema for storing details about appointment:

```
appointment (

    id INT PRIMARY KEY AUTO_INCREMENT,

    patient_id INT,
```

```
    doctor_id INT,
    patient_name VARCHAR(40),
    doctor_name VARCHAR(40),
    appointment_date DATE DEFAULT CURRENT_TIMESTAMP,
    description TEXT,
    status BOOLEAN DEFAULT FALSE,
    FOREIGN KEY (patient_id) REFERENCES patient(id),
    FOREIGN KEY (doctor_id) REFERENCES doctor(id)
);
```

The appointment entity represents a patient's appointment to consult a physician.

Here is a brief overview of the table columns:

- **id**: A unique integer identifier for each appointment, which is automatically incremented with each new appointment added.
- **patient_id**: The ID of the patient associated with this appointment, likely a foreign key referencing the id column of a patient table.
- **doctor_id**: The ID of the doctor associated with this appointment, likely a foreign key referencing the id column of a doctor table.
- **patient_name**: A string representing the name of the patient associated with this appointment.
- **doctor_name**: A string representing the name of the doctor associated with this appointment.
- **appointment_date**: The date of the appointment, with a default value of the current timestamp.

- **description**: A text field describing the details of the appointment.
- **status**: A boolean value indicating whether the appointment has been completed or is still pending.
- **PRIMARY KEY (id)**: Specifies that the id column is the primary key of the table, ensuring each row has a unique identifier.
- **FOREIGN KEY (patient_id) REFERENCES patient(id)**: A foreign key constraint that references the id column of the patient table, indicating the patient associated with this appointment.
- **FOREIGN KEY (doctor_id) REFERENCES doctor(id)**: A foreign key constraint that references the **id** column of the **doctor** table, indicating the doctor associated with this appointment.

7) Schema to store the patient discharge details:

```
patient_discharge_details (

    id INT PRIMARY KEY AUTO_INCREMENT,

    patient_id INT,

    patient_name VARCHAR(40),

    assigned_doctor_name VARCHAR(40),

    address VARCHAR(40),

    mobile VARCHAR(20),

    symptoms VARCHAR(100),

    test_results VARCHAR(500),

    admit_date DATE NOT NULL,

    release_date DATE NOT NULL,
```

```
    days_spent INT NOT NULL,
    room_charge INT NOT NULL,
    medicine_cost INT NOT NULL,
    doctor_fee INT NOT NULL,
    other_charge INT NOT NULL,
    total INT NOT NULL,
    FOREIGN KEY (patient_id) REFERENCES patient(id)
);
```

The patient_discharge_details entity represents the details of a patient's discharge from the hospital after treatment.

Here is a brief overview of the table columns:

- **id**: An auto-incrementing integer value that serves as the primary key of the table.
- **patient_id**: The ID of the patient who was discharged, referencing the id column of the patient table.
- **patient_name**: The name of the patient who was discharged.
- **assigned_doctor_name**: The name of the doctor who was assigned to the patient.
- **address**: The address of the patient who was discharged.
- **mobile**: The mobile phone number of the patient who was discharged.
- **symptoms**: The symptoms that the patient had when they were admitted to the hospital.
- **test_results**: The results of the tests that were performed on the patient.
- **admit_date**: The date on which the patient was admitted to the hospital.

- **release_date**: The date on which the patient was discharged from the hospital.
- **days_spent**: The number of days that the patient spent in the hospital.
- **room_charge**: The cost of the hospital room for the duration of the patient's stay.
- **medicine_cost**: The cost of the medicines that were given to the patient during their stay.
- **doctor_fee**: The fee charged by the doctor who treated the patient.
- **other_charge**: Any other charges that were incurred during the patient's stay.
- **total**: The total amount charged for the patient's treatment.
- **FOREIGN KEY (patient_id) REFERENCES patient(id)**: A foreign key constraint that ensures that the **patient_id** column references the **id** column of the patient table.

Languages/Technologies Used:-

1) Frontend

- **HTML**
- **CSS**
- **BootStrap**

2) Backend

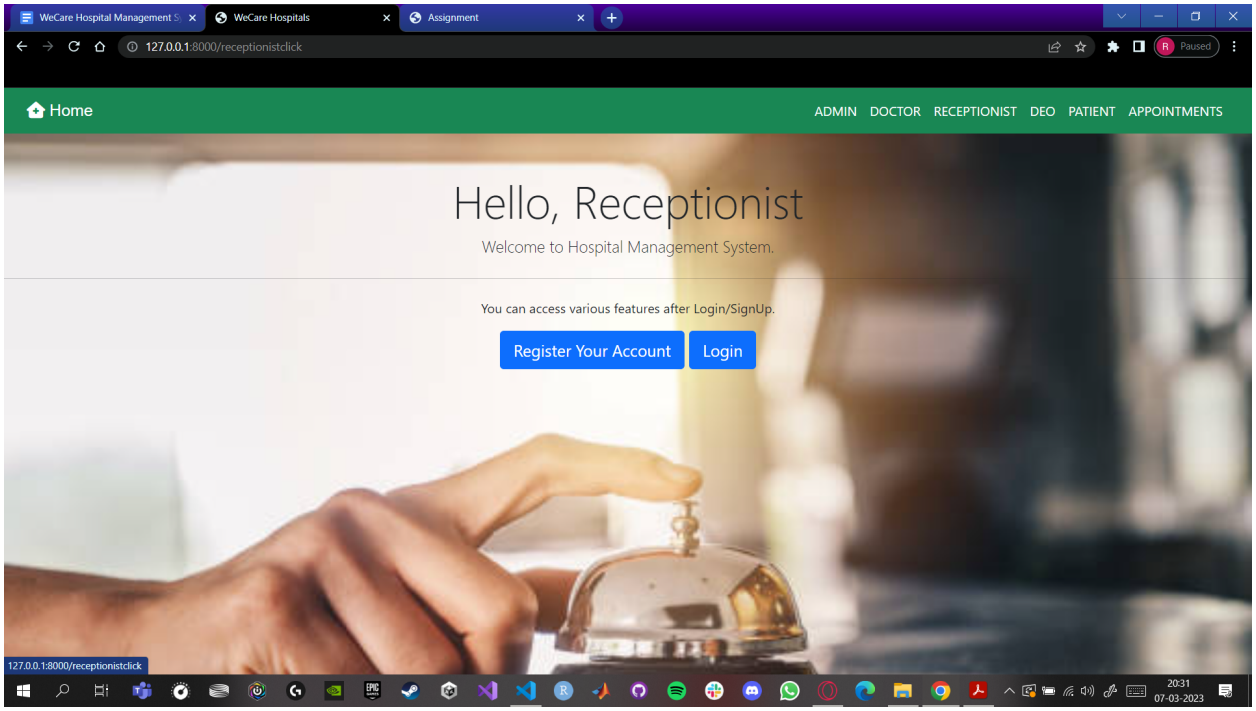
- **Python with Django framework**
- **Database- MySQL**

3) Tools

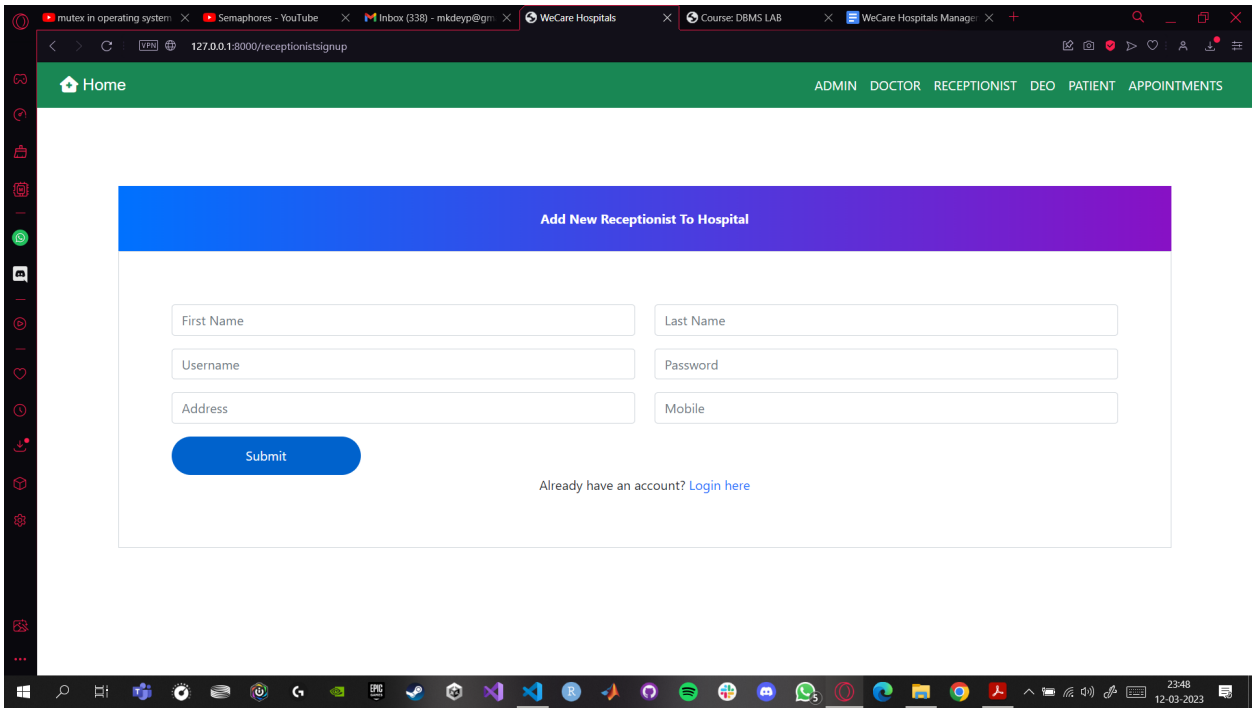
- **Visual Studio Code Editor**
- **Internet resources for learning**

Functionalities:-

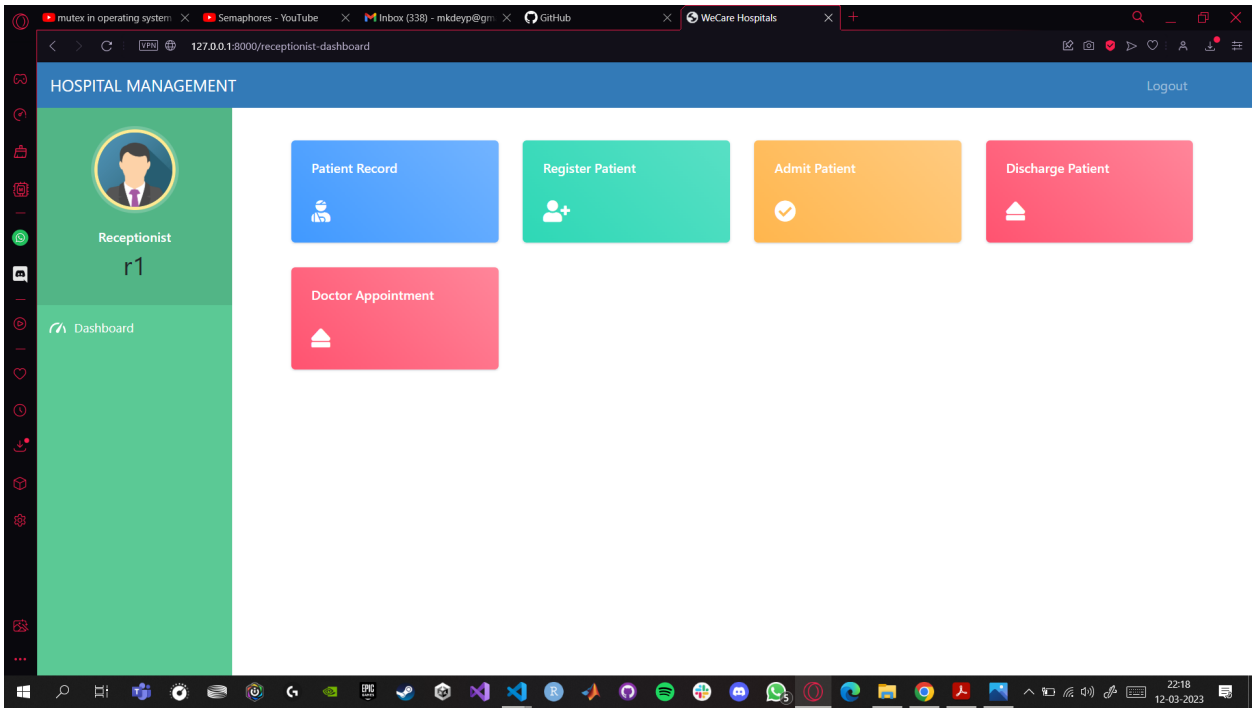
1) Front Desk Operators:



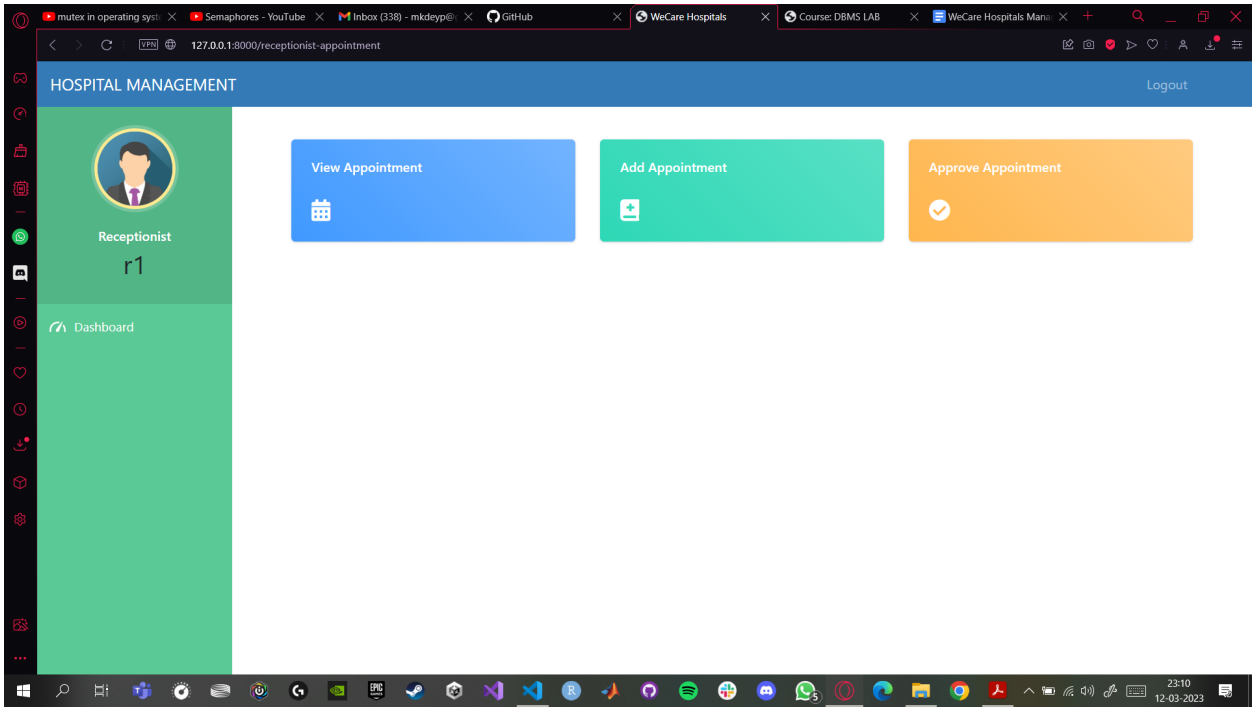
- Registers/admits/discharges patients
- Patient registration/discharge and doctor appointment/test scheduling – information about new patients are registered, appointments based on availability and priority are scheduled, doctors are notified about the appointments in a dashboard. For admitted patients a room is assigned based on available room capacity. For discharged patients information is preserved and room occupancy is updated.



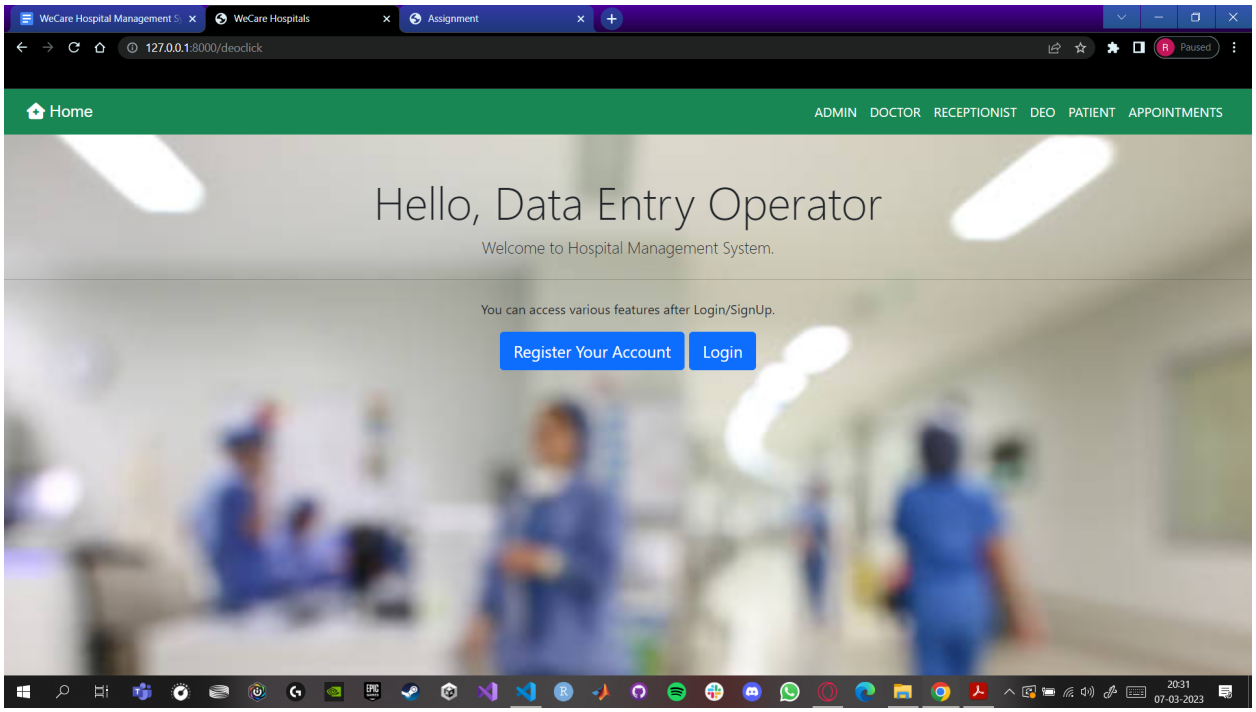
This is the registration page of the receptionist/front desk operator in our healthcare system.



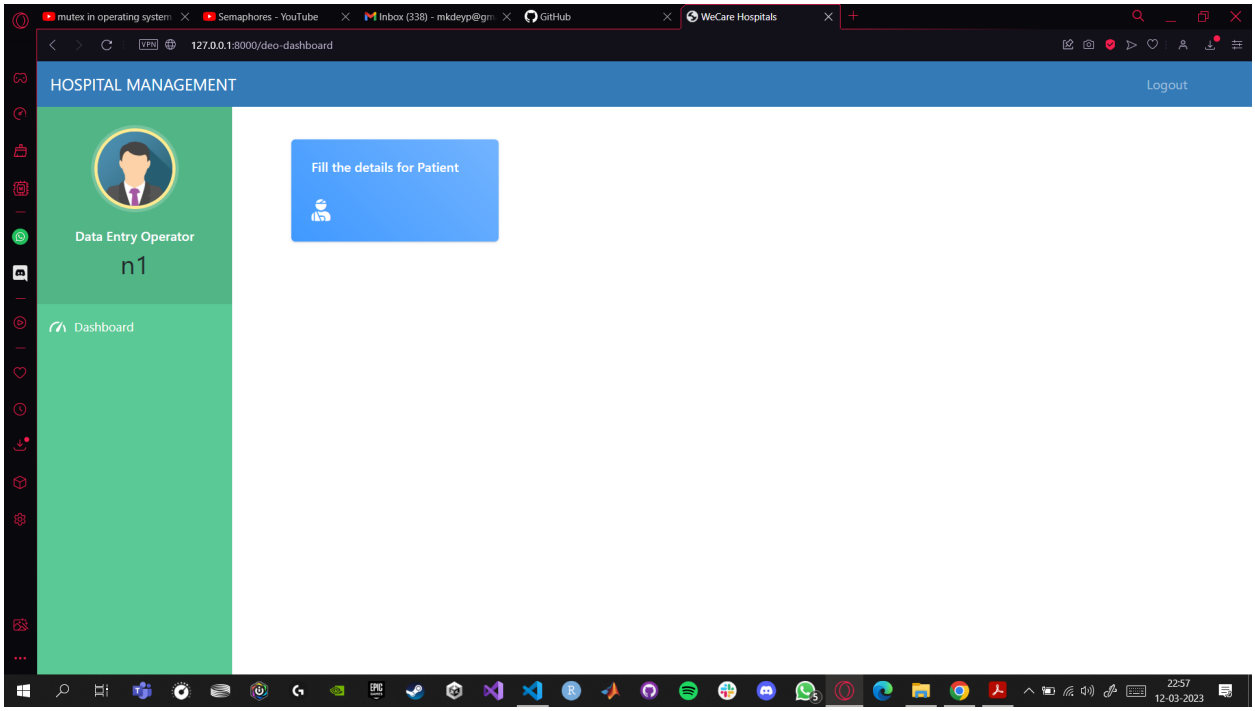
This is the dashboard of the frontdesk operator/receptionist of our system. It provides functions like maintaining patient records, registering a patient, admitting them and discharging a patient. Also, they can add, view and approve doctor appointments according to their schedule.



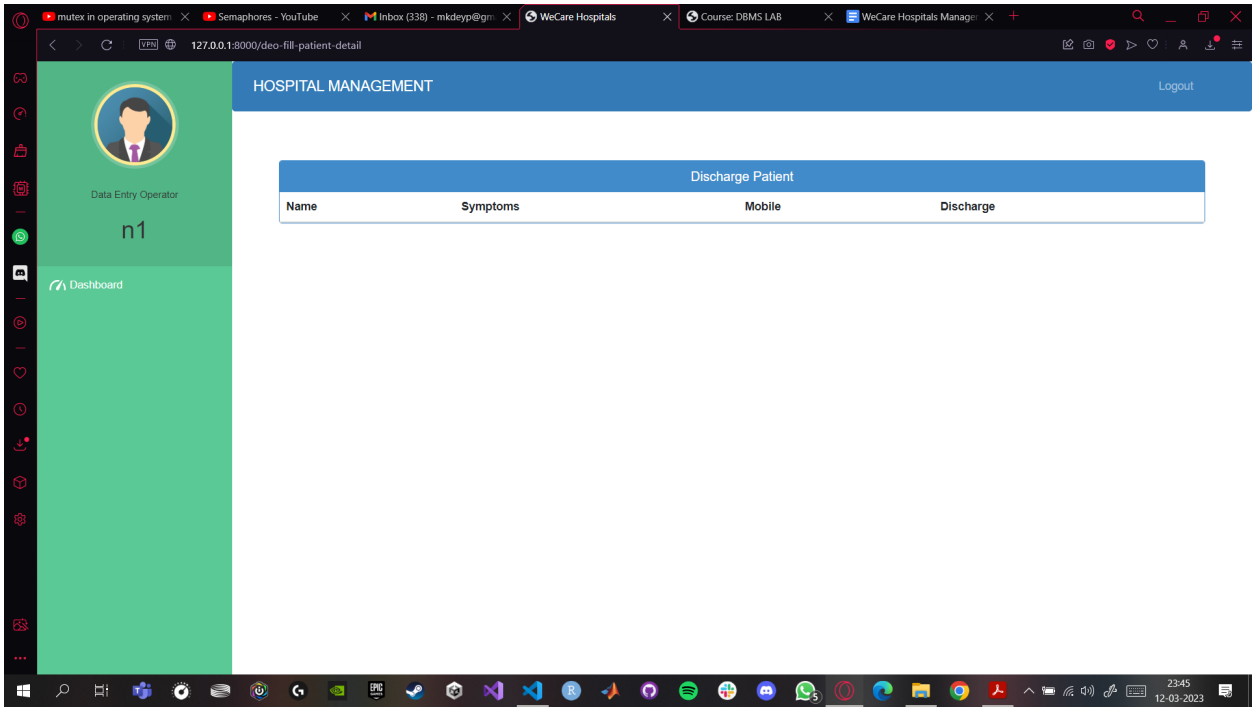
2) Data Entry Operators:



- Enters patient data about tests and treatments

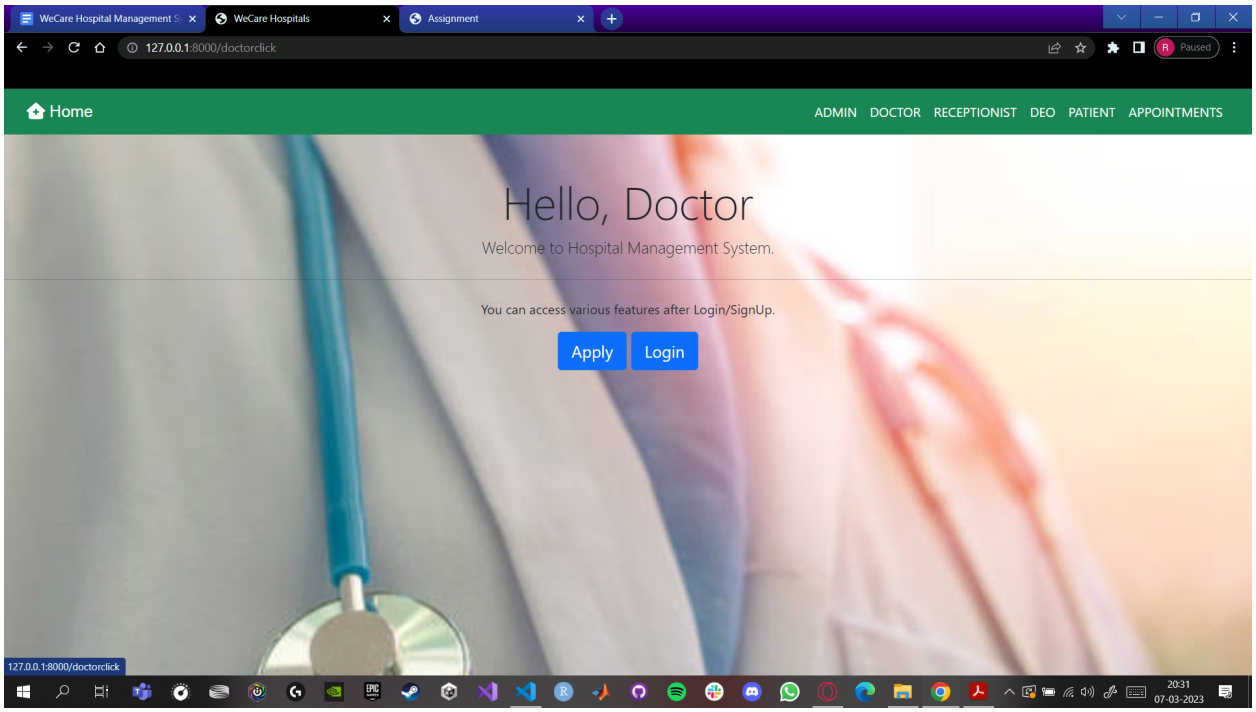


This is the dashboard of a data entry operator/nurse. The function of a nurse is to maintain the details of the patients and update the treatments and records of the patients.

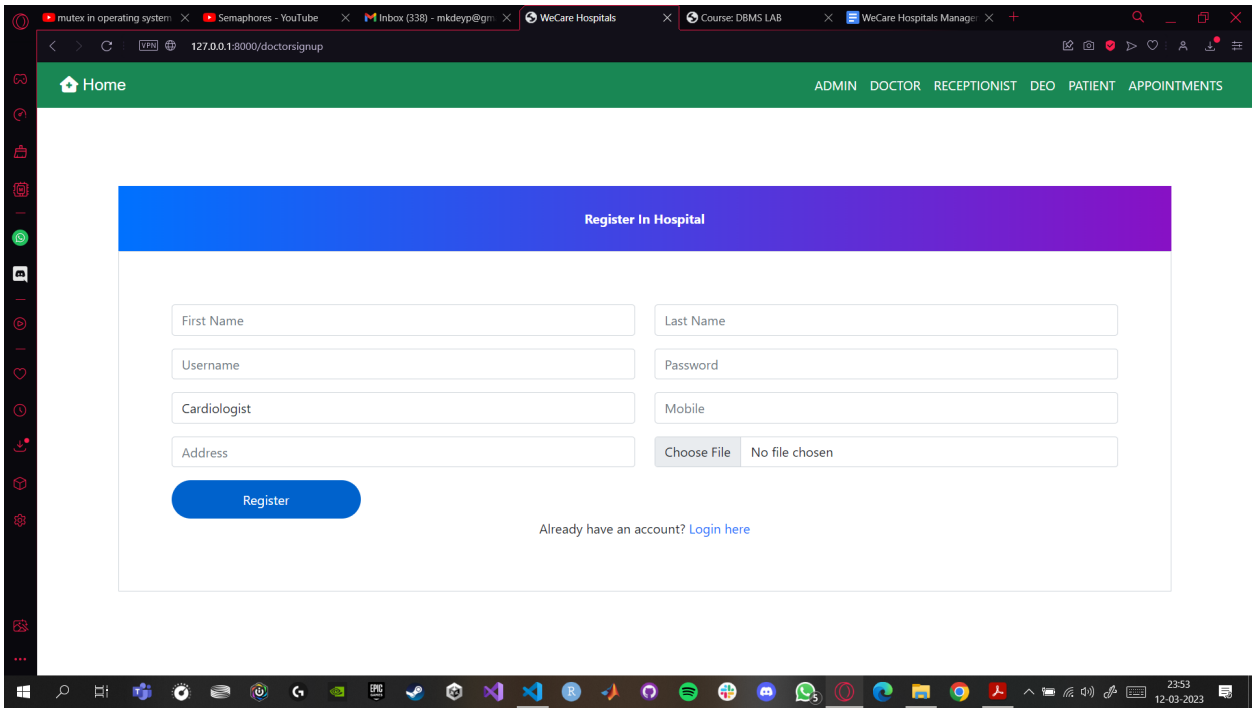


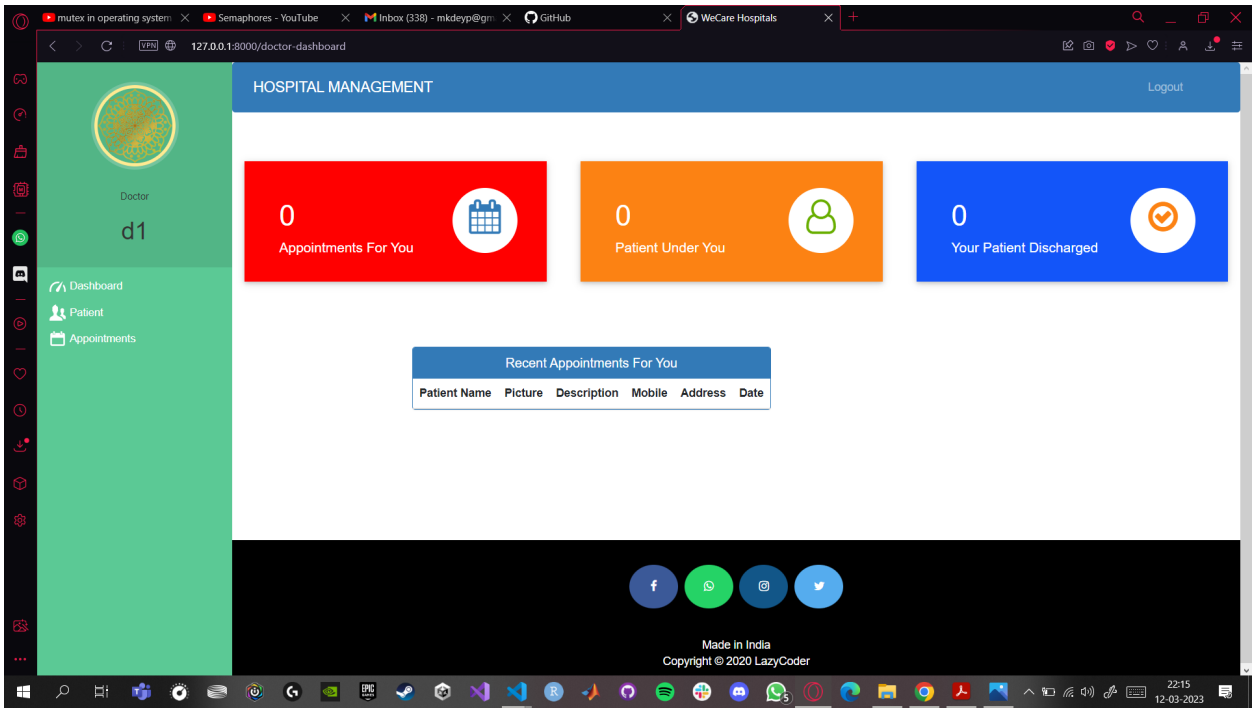
This is where the details of the patient are kept/updated by our nurse.

3) Doctors:

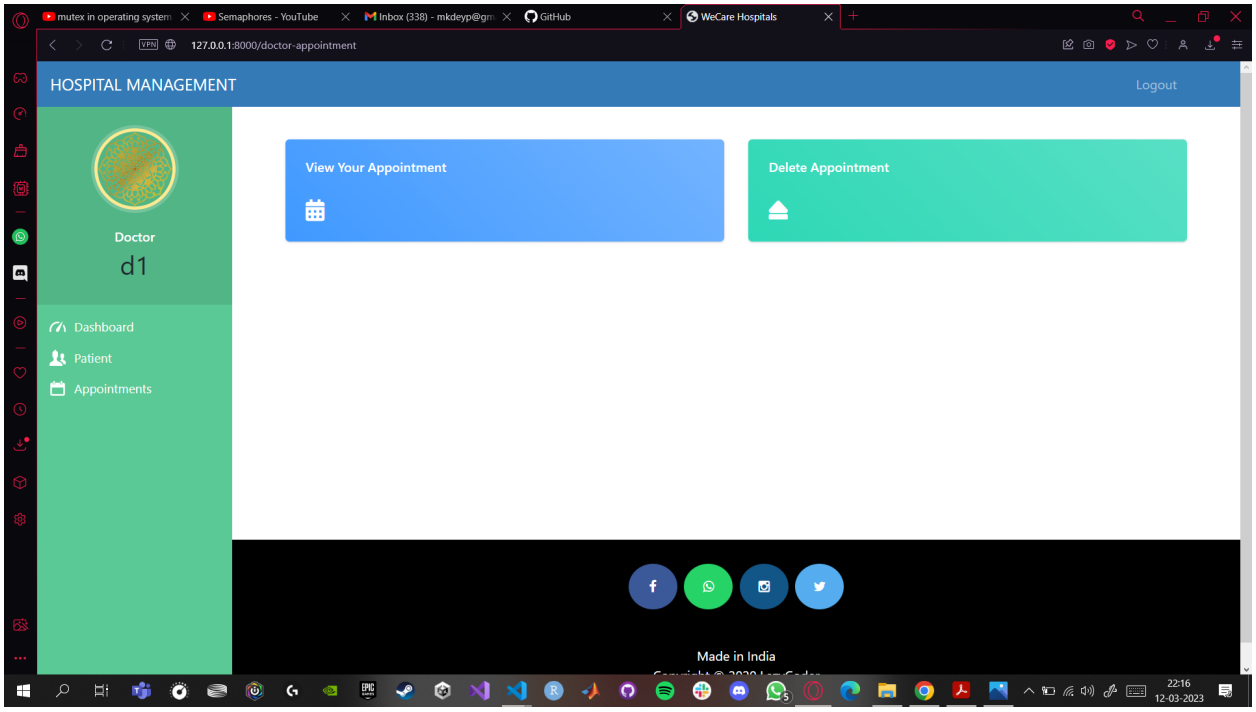


- Query patient information

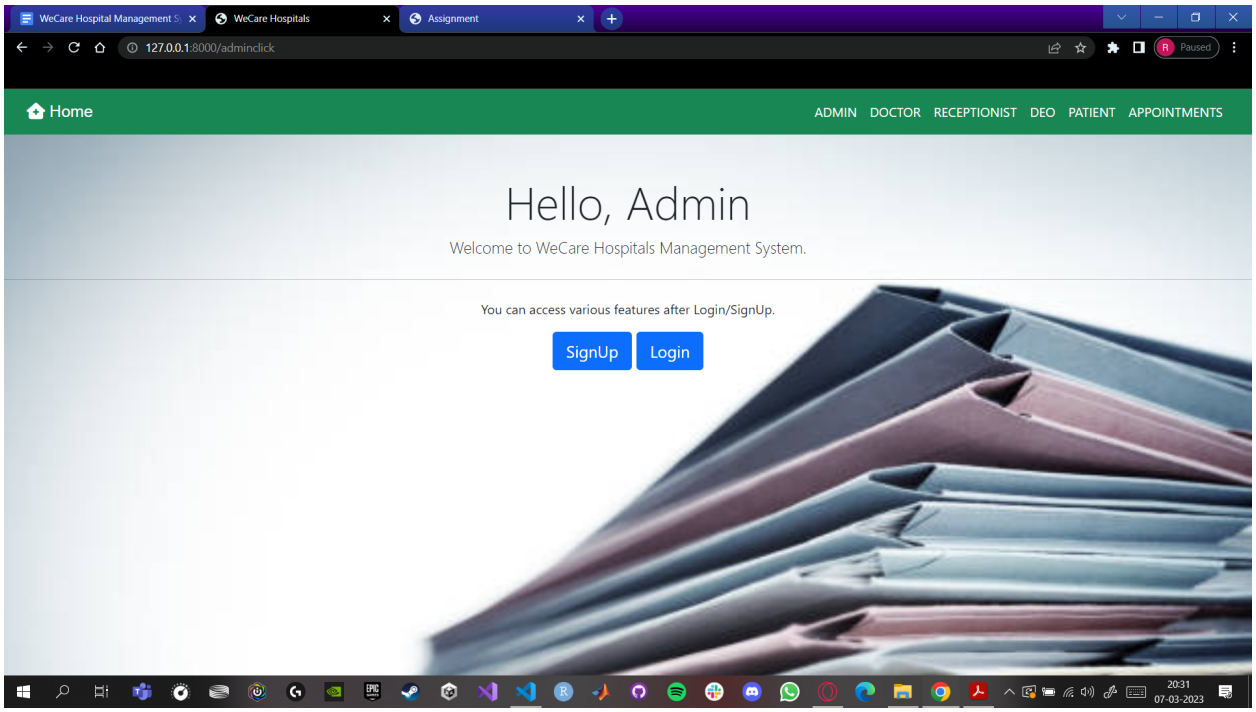




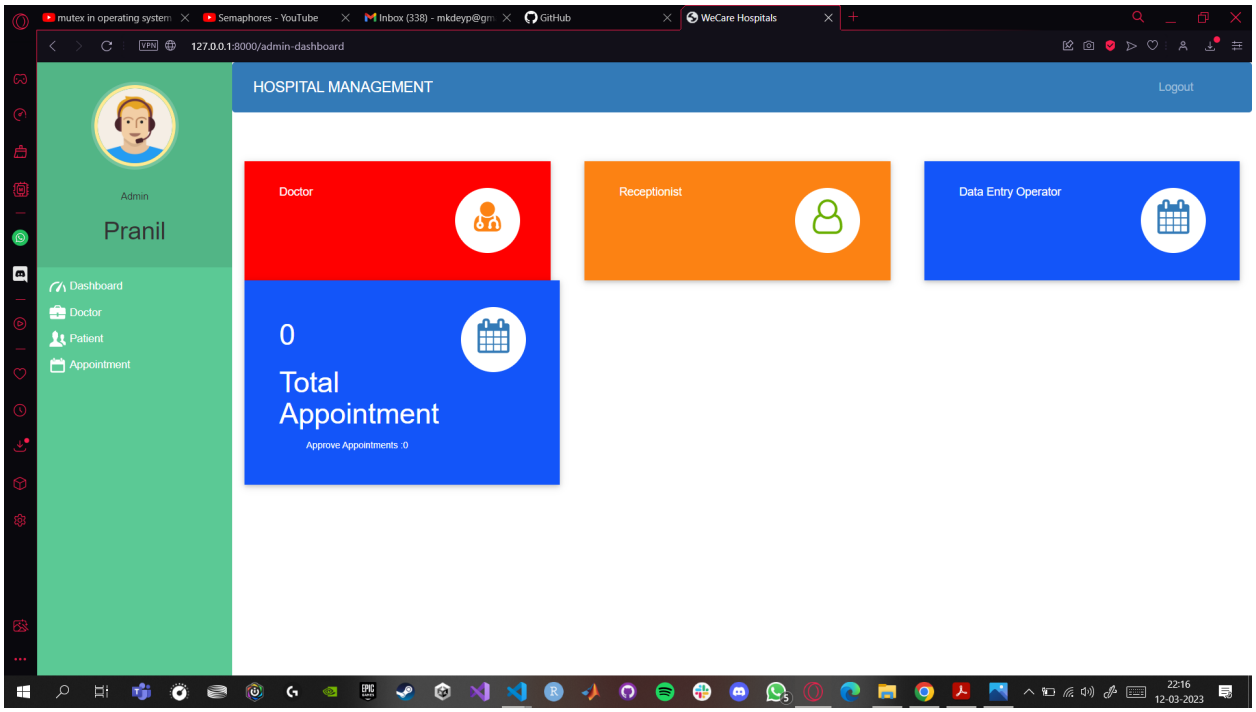
This is the doctor dashboard which is the page where a doctor of WeCare Hospitals can access the info of the patients that are under them. Doctors can also access and delete/cancel their upcoming appointments with patients.



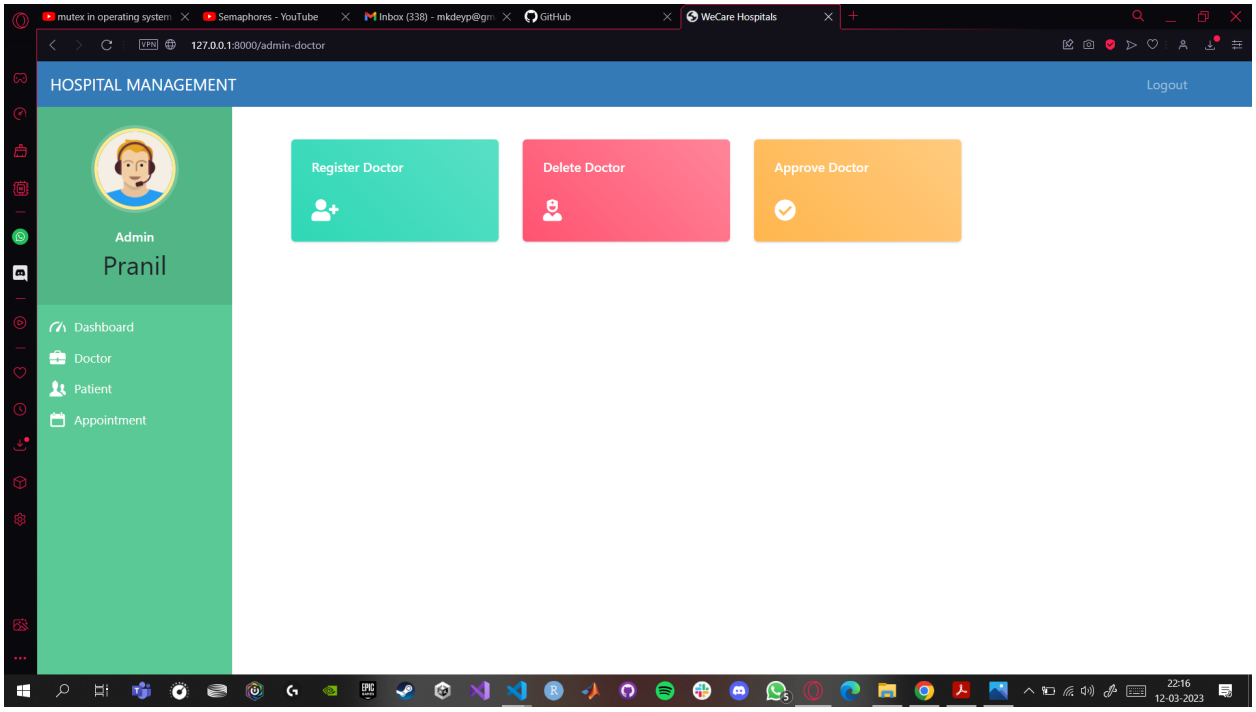
4) Database Administrators:



- Add/delete users

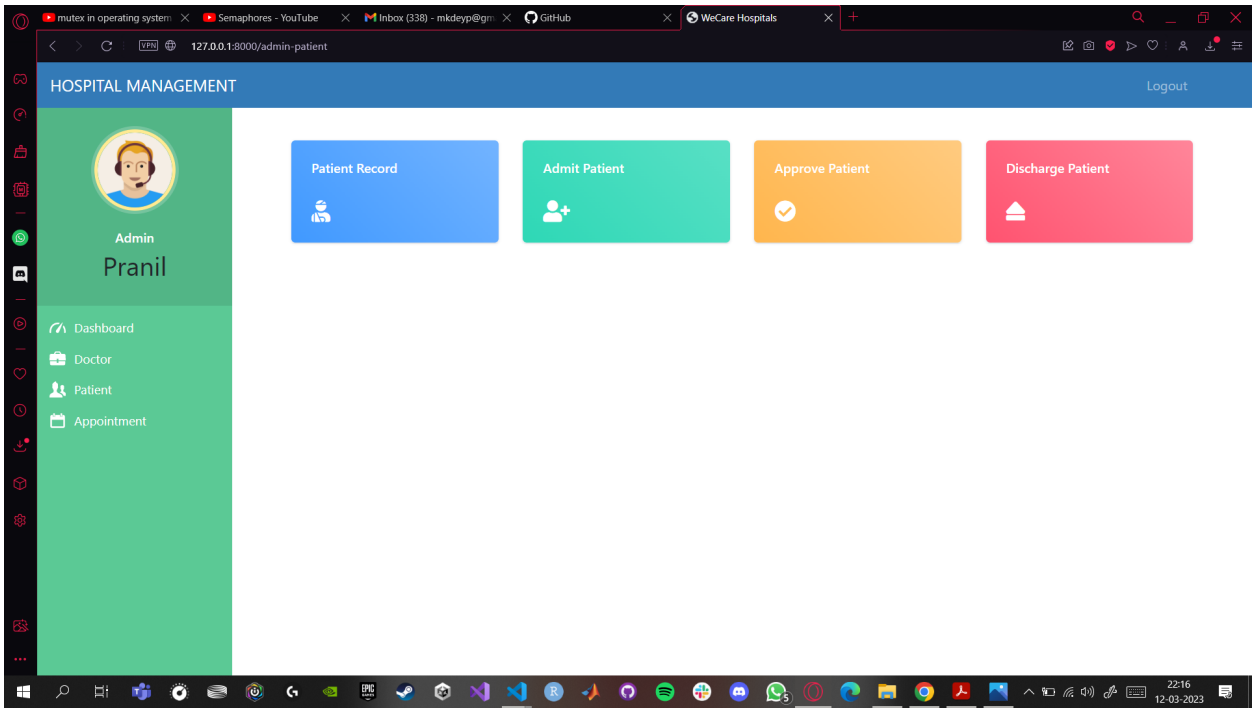


This is the admin dashboard which implements the functionality of a database administrator who can certify which doctor and nurse/data entry operator can be registered. They have control over user addition/deletion.



This is the doctor page in admin where the database admin can register,delete or approve a doctor in the healthcare system.

The admin can also control the information of any patient and can see all details,admit,approve and discharge them as shown below.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Semaphores - YouTube
Inbox (338) - mkdeyp@gm
GitHub
WeCare Hospitals
127.0.0.1:8000/admin-patient
HOSPITAL MANAGEMENT
Logout
Admin
Pranil
Dashboard
Doctor
Patient
Appointment
Patient Record
Admit Patient
Approve Patient
Discharge Patient
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