



**PES UNIVERSITY**

(Established under Karnataka Act No. 16 of 2013)

**Object Oriented Analysis and Design using Java  
(UE20CS352)**

**Mini Project**

**PROJECT TITLE:**

**HOSPITAL MANAGAMENT SYSTEM**

**Team No. 1**

**TEAM MEMBERS:**

**SAMPREET A PATIL**

**PES2UG20CS306**

**SAMYAK P SHETTY**

**PES2UG20CS307**

**SHAIK MOHAMMAD JEELAN**

**PES2UG20CS321**

**Submitted to:**

**Prof. Saranya Devi**

## **Problem statement:**

We have taken up the topic of Hospital Management system database project. This project would have patient records consisting of the patient's basic details. Each patient would be assigned to one doctor. However, each doctor could treat multiple patients. The system would also include some basic details pertaining to the individual doctor. Also, each patient would be assigned to a wardroom/ operation theater/ ICU. Additionally, the patient care staff including the nurses and ward boys would be assigned some rooms.

We are going to consider two user types – Receptionist and Doctor in this system. The system will be accessible only using valid usernames and passwords for each user type.

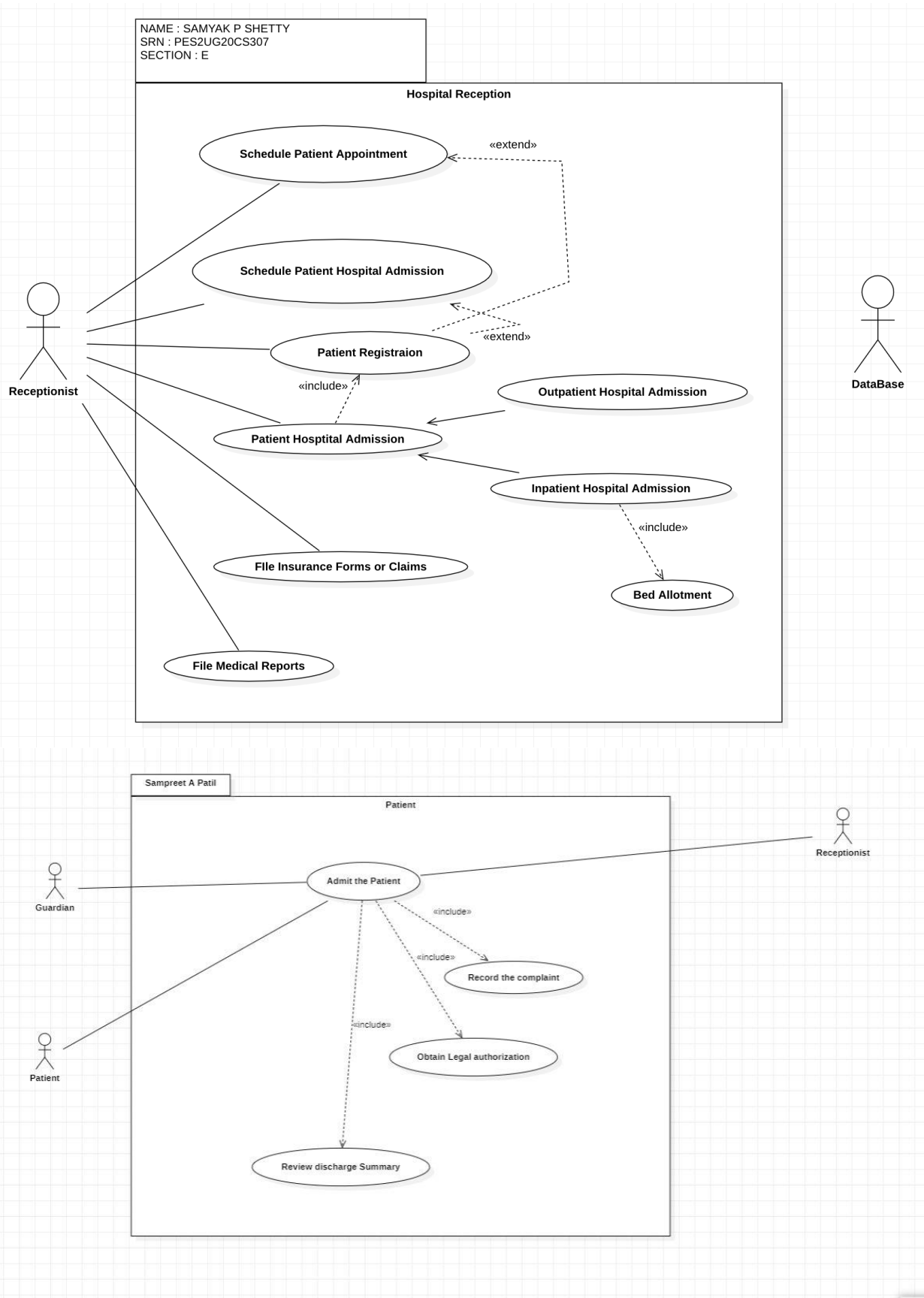
### **1. Receptionist:**

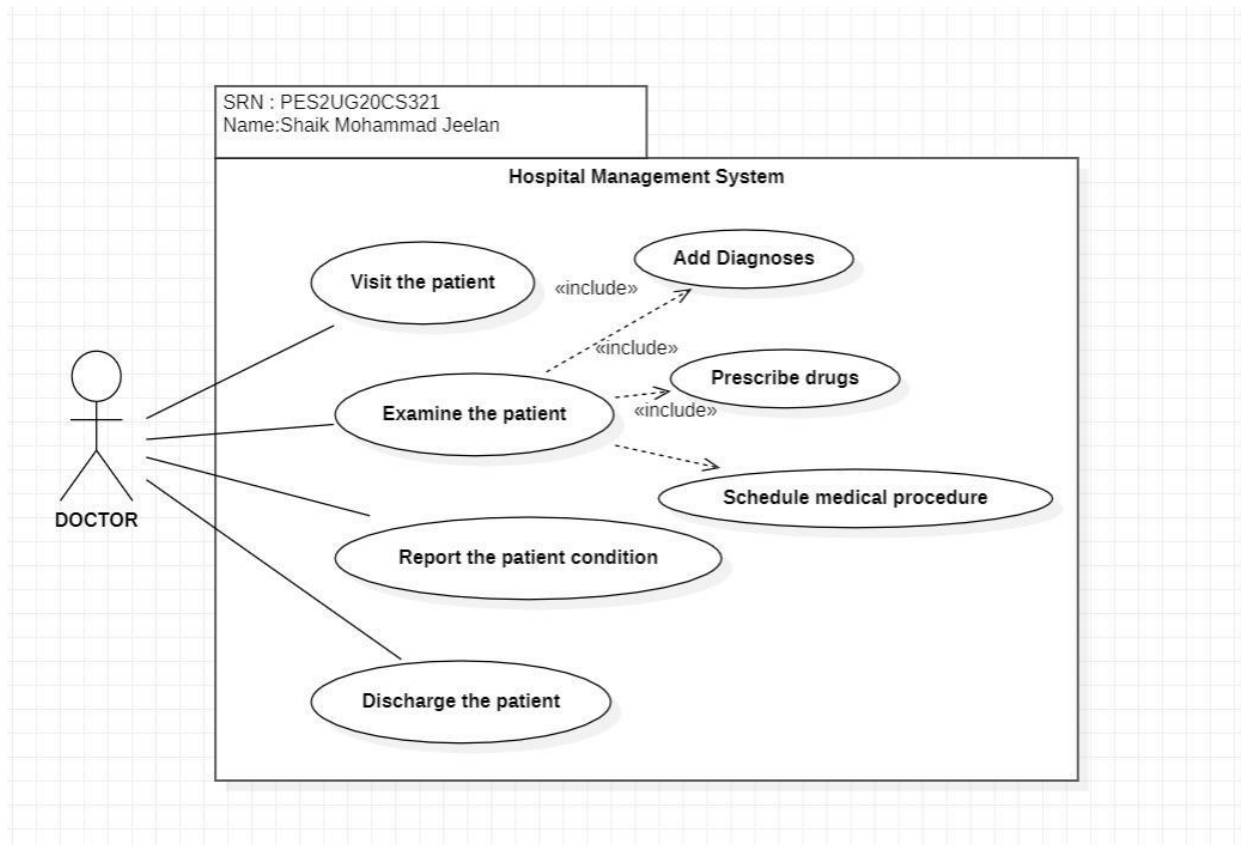
- The receptionist here has full access to the system.
- They can register a new doctor or another receptionist to the system
- They can add a new record for patient, doctor and other staff in the system
- They can retrieve existing record for patient, doctor and other staff
- They can edit patient and staff details and update it in the database
- They can create an appointment for a patient and assign him a doctor
- They can create/update and delete a record for a room/operation theatre/ ICU
- They can obtain the room/operation theatre/ ICU that are unassigned
- They can allocate/deallocate a room/operation theatre/ ICU to a patient and update its status in the database
- They can assign or remove assignment of the staff (nurse and ward boys) to the rooms/operation theater/ICU

### **2. Doctor:**

- The doctor will login to the system with his username and password.
- The doctor will be able to add and update his own details in the system. They will not be able to add or update details of other doctors in the system
- They will be able to view details about other doctors in the hospital database
- They will be able to retrieve the patient records as well as the patients assigned to them
- They will also be able to view the room/operation theatre/ ICU the patient is assigned to
- They can also add/update a diagnosis and prescription for the patient

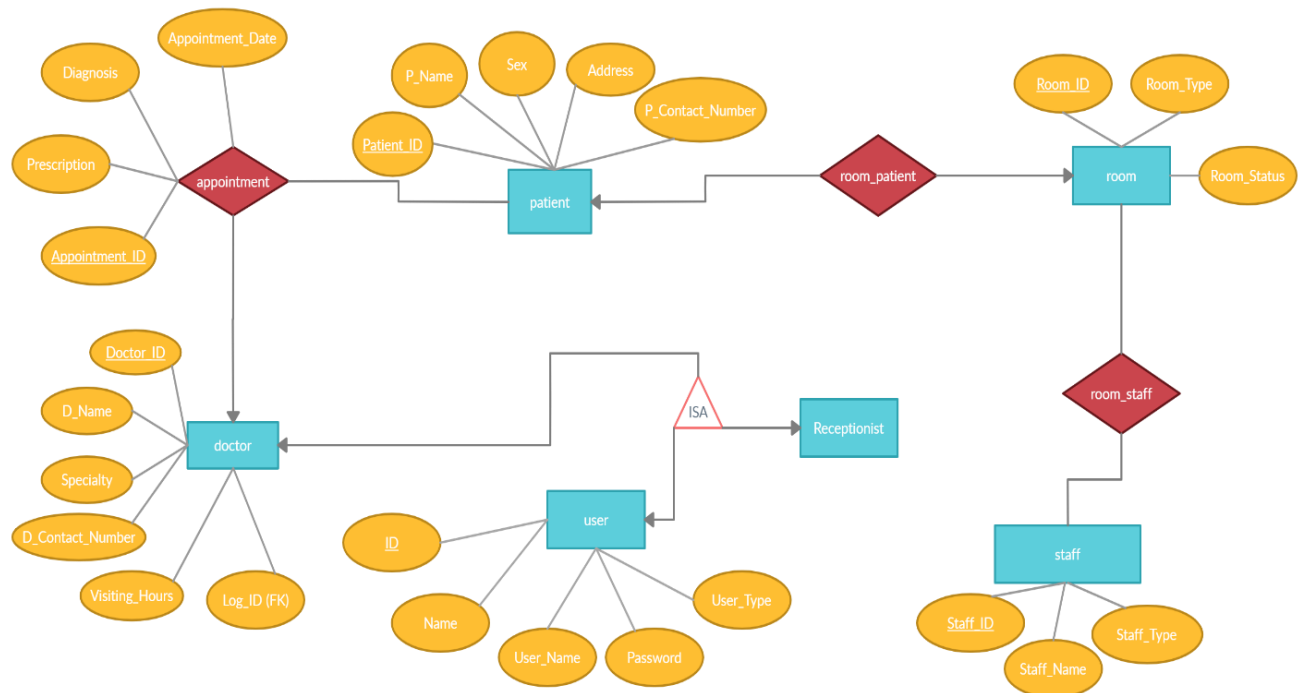
## Models:





ER Diagram:

E/R Diagram of Hospital Management System



## Architecture Patterns:

**Model-View-Controller (MVC):** The e-commerce application project uses the MVC pattern, which separates the application into three main components: the Model (the data and business logic), the View (the user interface), and the Controller (the logic that handles user input and manages the communication between the Model and the View). This pattern promotes modularity, flexibility, and maintainability by reducing the coupling between different components of the system.

## Design Principles:

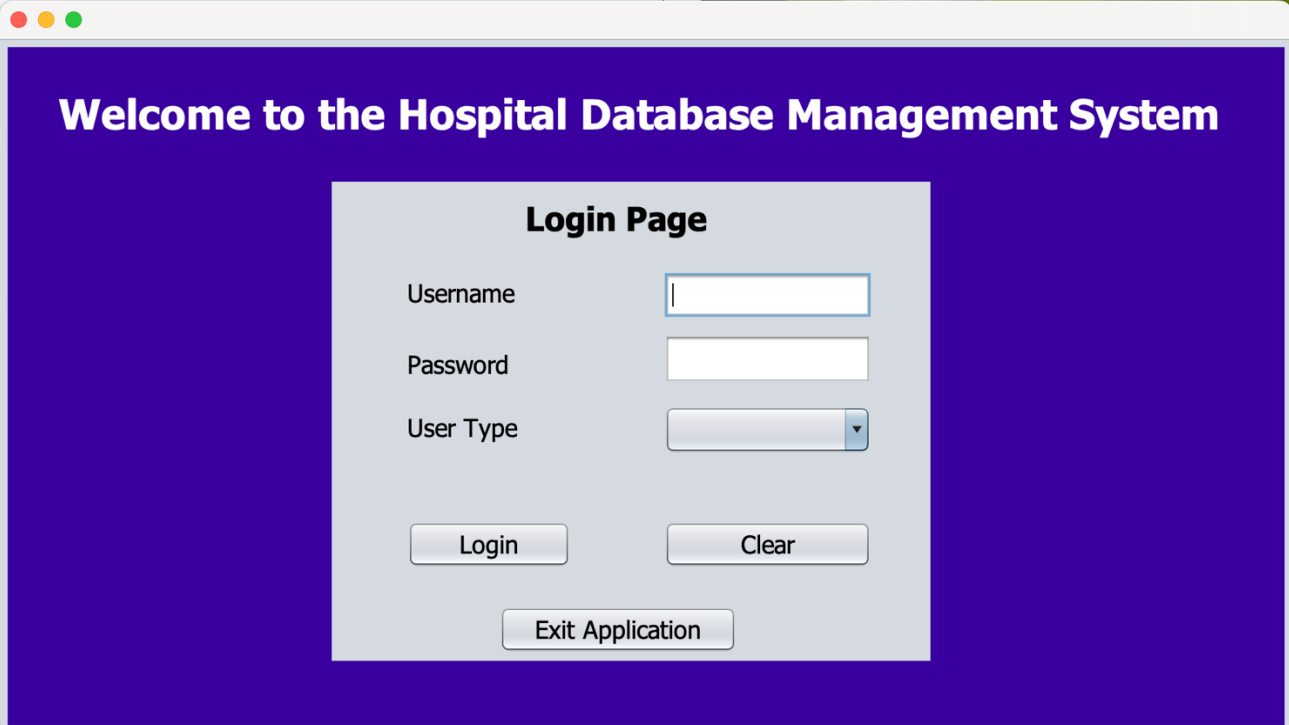
1. **Single Responsibility Principle (SRP):** Each class should have only one responsibility or reason to change. Here, Receptionist class is responsible for managing the users.
2. **Open-Closed Principle (OCP):** Classes should be open for extension but closed for modification. This means that you should be able to add new functionality to a class without having to modify its existing code. For example, you should be able to add a new appointment method without having to change the Receptionist class.
3. **Liskov Substitution Principle (LSP):** Subtypes should be substitutable for their base types. This means that any subclass of a class should be able to replace its superclass without affecting the correctness of the program. For example, a Appointment class should be able to replace a other class without causing any issues.
4. **Interface Segregation Principle (ISP):** Clients should not be forced to depend on interfaces they do not use. This means that interfaces should be kept small and focused on a specific task. For example, a Appointment interface should only include methods related to Appointment and not methods related to adding users.
5. **Dependency Inversion Principle (DIP):** High-level modules should not depend on low-level modules. Both should depend on abstractions. This means that classes should depend on interfaces or abstract classes rather than concrete implementations. For example, a Appointment class should depend on an interface like CreateAppointment rather than a concrete implementation like CreateNewPatient.

## Design Patterns:

1. **Factory Pattern:** This pattern can be used to create different types of medical equipment or medications without exposing the details of their creation to the client. For example, the hospital management system can use the factory pattern to create different types of medical devices such as ventilators or X-ray machines.
2. **Singleton Pattern:** This pattern can be used to manage a single instance of classes such as Patient or Doctor. It ensures that only one instance of these classes is created and provides a global point of access to it. In a hospital management system, the singleton pattern can be used to manage the patient's medical history or the doctor's schedule.
3. **Strategy Pattern:** This pattern can be used to manage different medical procedures, such as surgery or chemotherapy, by encapsulating them in separate classes. In a hospital management system, the strategy pattern can be used to manage different types of medical treatments, such as pharmacological or non-pharmacological treatments.
4. **Observer Pattern:** This pattern can be used to notify doctors or patients of medical updates or changes automatically. In a hospital management system, the observer pattern can be used to notify doctors of changes in a patient's medical status or to inform patients of appointment updates.
5. **Decorator Pattern:** This pattern can be used to add new functionality to a patient or a doctor by wrapping them in a decorator class that provides additional behavior. For example, in a hospital management system, the decorator pattern can be used to add features such as adding a new medical procedure to a patient's treatment or adding a new specialization to a doctor's profile.

## Screenshots:

### 1. User Login



A screenshot of a web application window titled "Welcome to the Hospital Database Management System". The background is dark blue. In the center is a light gray box titled "Login Page". Inside this box, there are three input fields: "Username" (a text box with a cursor), "Password" (a text box), and "User Type" (a dropdown menu). Below these fields are three buttons: "Login", "Clear", and "Exit Application".

**Welcome to the Hospital Database Management System**

**Login Page**

Username

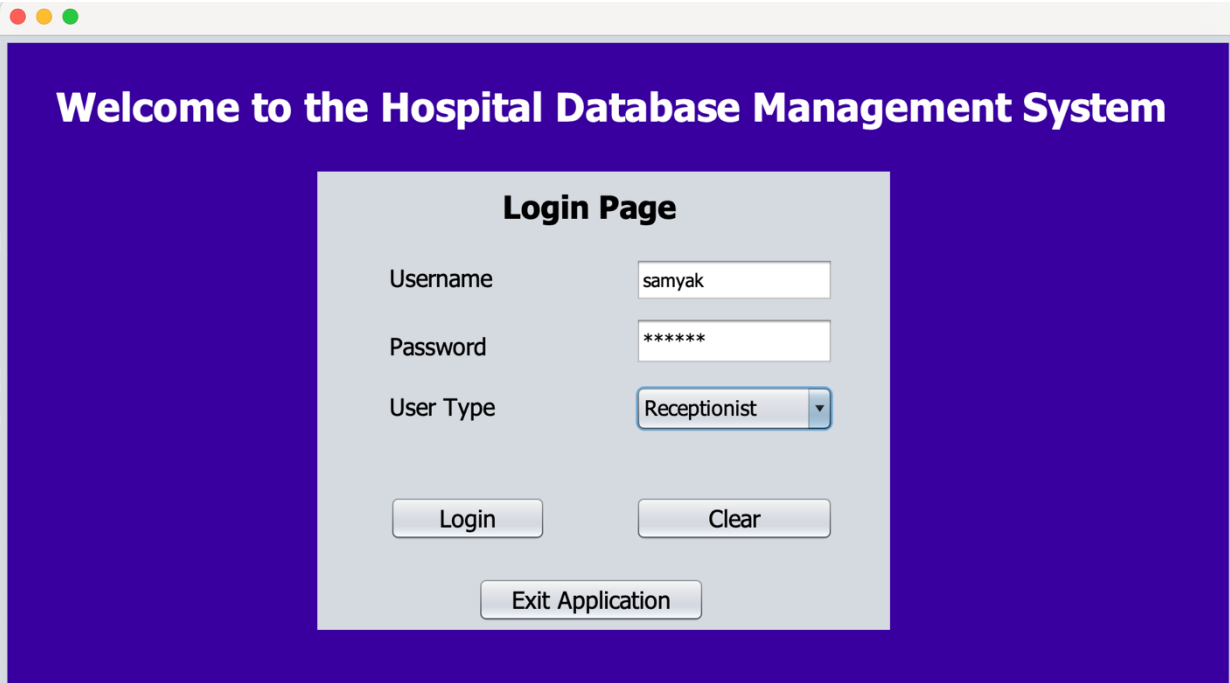
Password

User Type

Login Clear

Exit Application

### 2. Receptionist Profile



A screenshot of the same web application window, but with the "User Type" dropdown menu set to "Receptionist". The "Username" field now contains the text "samyak" and the "Password" field contains "\*\*\*\*\*". The "Login", "Clear", and "Exit Application" buttons are still present.

**Welcome to the Hospital Database Management System**

**Login Page**

Username

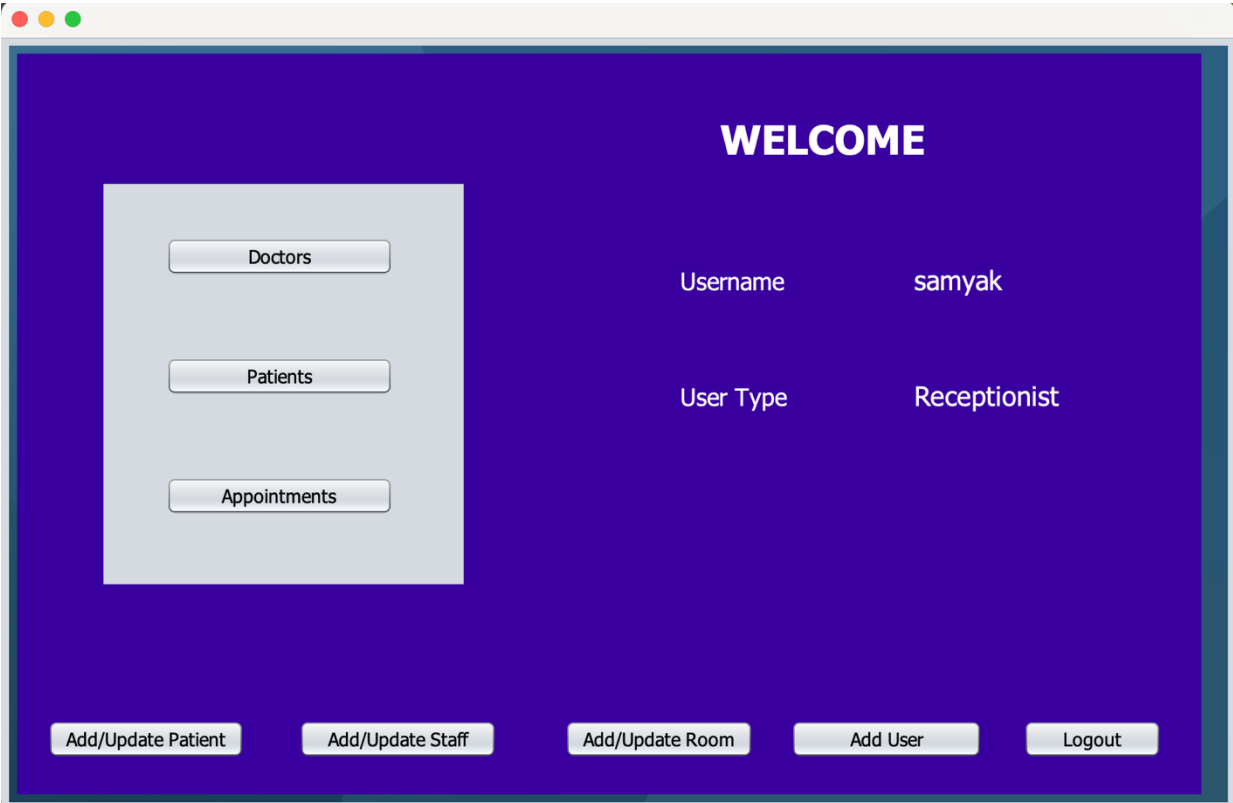
Password

User Type

Login Clear

Exit Application

### 3. Receptionist Front Page



A screenshot of a web application interface for a receptionist. The background is a solid purple color. At the top center, the word "WELCOME" is displayed in white, bold, uppercase letters. On the left side, there is a light gray rectangular box containing three buttons: "Doctors", "Patients", and "Appointments", each with a thin gray border. To the right of this box, the text "Username" is followed by the value "samyak", and "User Type" is followed by the value "Receptionist". At the bottom of the page, there is a horizontal row of five buttons: "Add/Update Patient", "Add/Update Staff", "Add/Update Room", "Add User", and "Logout".

**WELCOME**

Doctors

Patients

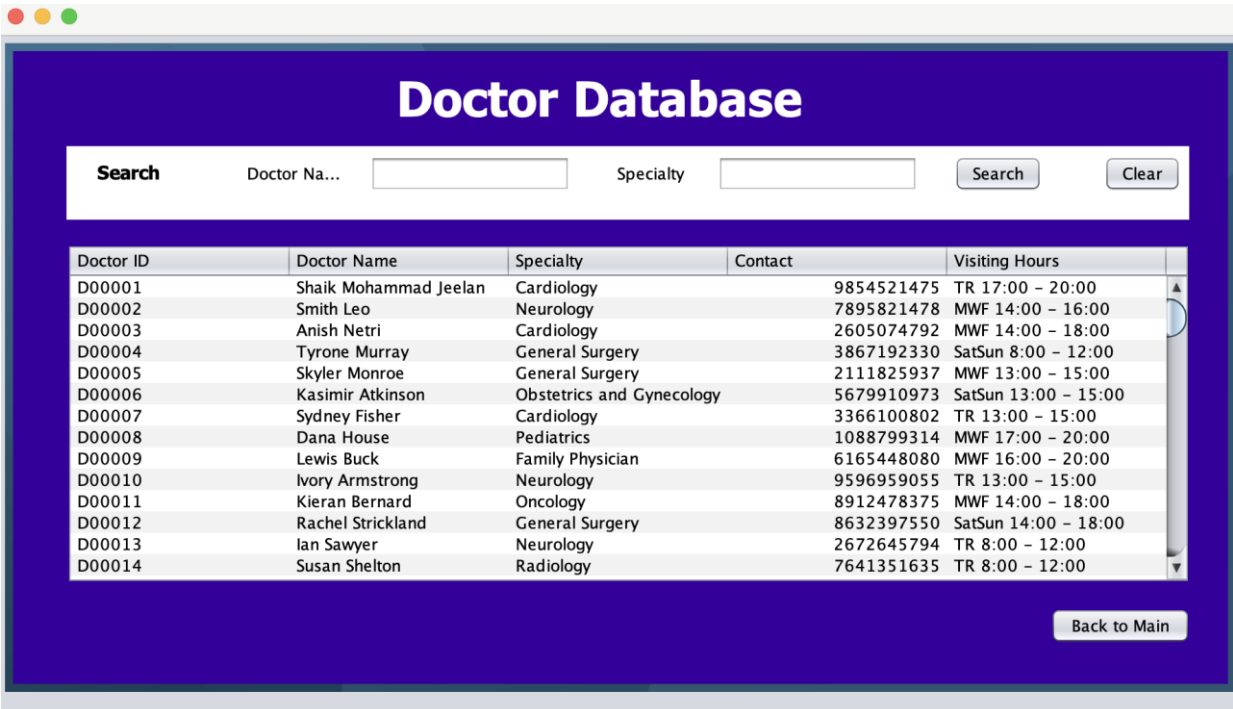
Appointments

Username samyak

User Type Receptionist

Add/Update Patient Add/Update Staff Add/Update Room Add User Logout

### 4. Doctors



A screenshot of a web application interface titled "Doctor Database". The background is a solid purple color. At the top, the title "Doctor Database" is displayed in white, bold, uppercase letters. Below the title, there is a search bar with the label "Search" and two input fields: "Doctor Na..." and "Specialty". To the right of these fields are two buttons: "Search" and "Clear". Below the search bar, there is a table with five columns: "Doctor ID", "Doctor Name", "Specialty", "Contact", and "Visiting Hours". The table contains 14 rows of data. At the bottom right of the page, there is a button labeled "Back to Main".

Doctor ID	Doctor Name	Specialty	Contact	Visiting Hours
D00001	Shaik Mohammad Jeelan	Cardiology	9854521475	TR 17:00 – 20:00
D00002	Smith Leo	Neurology	7895821478	MWF 14:00 – 16:00
D00003	Anish Netri	Cardiology	2605074792	MWF 14:00 – 18:00
D00004	Tyrone Murray	General Surgery	3867192330	SatSun 8:00 – 12:00
D00005	Skyler Monroe	General Surgery	2111825937	MWF 13:00 – 15:00
D00006	Kasimir Atkinson	Obstetrics and Gynecology	5679910973	SatSun 13:00 – 15:00
D00007	Sydney Fisher	Cardiology	3366100802	TR 13:00 – 15:00
D00008	Dana House	Pediatrics	1088799314	MWF 17:00 – 20:00
D00009	Lewis Buck	Family Physician	6165448080	MWF 16:00 – 20:00
D00010	Ivory Armstrong	Neurology	9596959055	TR 13:00 – 15:00
D00011	Kieran Bernard	Oncology	8912478375	MWF 14:00 – 18:00
D00012	Rachel Strickland	General Surgery	8632397550	SatSun 14:00 – 18:00
D00013	Ian Sawyer	Neurology	2672645794	TR 8:00 – 12:00
D00014	Susan Shelton	Radiology	7641351635	TR 8:00 – 12:00

Back to Main



## 5. Patients

### Patient Database

Search

Patient ID

Patient Name

Search

Clear

Patient ID	Patient Name	Sex	Contact	Address	Appointment Date	Room Number
P00001	Anna Todd	F	9852014788	College Station, ...	2020-10-01	R0001
P00002	Rick Morley	M	2452583360	Dallas, Texas	2020-10-09	
P00003	Had Errichiello	M	2028444802	Washington, Dist...	2020-10-21	
P00004	Halsey Hakey	M	7205886445	Denver, Colorado	2020-10-22	
P00005	Marlowe Morley	M	4048003411	Atlanta, Georgia	2020-10-17	R0011
P00006	Abdel Garces	M	9049794693	Saint Augustine, ...	2020-10-16	R0025
P00007	Allina Maris	F	4144764158	Milwaukee, Wisc...	2020-10-20	
P00008	Lib O'Giany	F	8169078452	Kansas City, Mis...	2020-07-19	
P00009	Benedetto Dagw...	M	7652190360	Muncie, Indiana	2020-07-31	
P00010	Dewitt Adrianello	M	6166498489	Grand Rapids, ...	2020-10-20	
P00011	Dewitt Adrianello	M	6166498489	Grand Rapids, ...	2020-03-17	
P00012	Sarah Olivetta	F	4194071061	Toledo, Ohio	2020-02-14	
P00013	Bern Gelling	M	2547324116	Gatesville, Texas	2020-05-21	

Click a record to create an appointment and assign/deallocate room for a patient

Create AppointmentAssign/Deallocate RoomBack to Main

## 6. Appointments

### Appointment Database

Search

Patient ID

Patient Name

Appointment Date

Doctor Name

Search

Clear

Appointment ID	Patient ID	Patient Name	Doctor Name	Appointment Date	Diagnosis	Prescription
A00001	P00001	Anna Todd	Shaik Mohamma...	2020-10-01	Fever	Crocin
A00002	P00002	Rick Morley	Smith Leo	2020-10-09		
A00004	P00007	Allina Maris	Anish Netri	2020-10-20		
A01010	P01500	Rick Hall	Tyrone Murray	2020-10-22		
A00006	P00010	Dewitt Adrianello	Skyler Monroe	2020-10-20		
A00008	P00008	Lib O'Giany	Skyler Monroe	2020-07-19	Activity, oth invol...	Monitor Skin/Bre...
A00200	P00200	Patrick Blemen	Skyler Monroe	2020-08-31	Poisoning by car...	Restrict L Radial ...
A00290	P00290	Matteo Paske	Skyler Monroe	2020-07-01	Anal sphincter te...	Supplement R Gl...
A00482	P00482	Lynsey Bodle	Skyler Monroe	2020-08-25	Ntrm subarach h...	Excision of C-tho...
A00572	P00572	Fabio Coyle	Skyler Monroe	2020-03-08	Leakage of indw...	Excision of Rectu...
A00764	P00764	Base Roelvink	Skyler Monroe	2020-07-09	Breakdown (mec...	Excision of Bladd...
A00854	P00854	Nicolai Gargett	Skyler Monroe	2020-02-12	Implant cysts of i...	Drainage of Mid ...
A00009	P00009	Benedetto Dagw...	Kasimir Atkinson	2020-07-31	Other interstitial	Supplement R Le...

Back to Main

## 7. ADD/UPDATE Patient

### Patient Database

#### Patient Registration Form

Patient ID **P01505**

Patient Na...

Sex

Contact

Address

Patient ID	Patient Name	Sex	Contact	Address
P00001	Anna Todd	F	9852014788	College Stati...
P00002	Rick Morley	M	2452583360	Dallas, Texas
P00003	Had Errichie...	M	2028444802	Washington,...
		M	7205886445	Denver, Col...
		M	4048003411	Atlanta, Ge...
		M	9049794693	Saint August...
		F	4144764158	Milwaukee, ...
		F	8169078452	Kansas City,...
		M	7652190360	Muncie, Indi...
		M	6166498489	Grand Rapi...
		F	4194071061	Toledo, Ohio
		M	2547324116	Gatesville, ...
P00013	Cass Nolton	M	3048691036	Huntington, ...
P00014	Dael Gagan	M	2819735041	Houston, Te...
P00015	Denis Pasm...	M	7089308086	Schaumbur...
P00016	Natalie O'Ka...	F	9701449865	Fort Collins,...
P00017	Fanechka T...	F	9152348537	El Paso, Te...
P00018	Camala Mac...	F	6017660119	Jackson, Mi...
P00019	Rozalin Ros...	F	7206866455	Littleton, Co...
P00020	Lorin Starke	F	2230542858	Los Angeles

Message

Patient Details Updated

Click a record to update the patient details

## 8. ADD/UPDATE Staff

### Staff Database

Staff ID **S0001**

Staff Name

Staff Type

Staff ID	Staff Name	Staff Type	Room Number Assigned
S0001	Jill Greene	Nurse	R0001
S0004	Betty James	Nurse	R0009
S0008	Doreen Hearon	Ward Boy	R0012
S0425	Mary Jmes	Nurse	R0006
S0003	Phil Lewis	Ward Boy	R0007
S0002	Peter Dan	Nurse	
S0005	Patrick Nunes	Ward Boy	
S0006	Ferrell Rigmand	Nurse	
S0007	Eldin Tuddenham	Nurse	
S0009	Enrique Brickstock	Nurse	

Click a record to update the staff details and make assignments

## 9. ADD/UPDATE Room

Room ID

R0001

Room Type

General Ward

Add

Cancel

Update

Delete

Room ID	Room Type	Status
R0001	General Ward	Assigned
R0006	Operation Theater	Unassigned
R0007	General Ward	Unassigned
R0009	Operation Theater	Unassigned
R0011	General Ward	Assigned
R0012	General Ward	Assigned
R0013	ICU	Unassigned
R0014	Long Term ICU	Unassigned
R0015	General Ward	Unassigned
R0016	Operation Theater	Unassigned
R0017	Operation Theater	Unassigned
R0018	ICU	Unassigned

Click a record to update the room type

Back to Main

## 10. Doctor Page

Doctor ID

D00001

Doctor Name

Shaik Mohammad Jeelan

Specialty

Cardiology

Contact

9854521475

Visiting Hours

TR 17:00 - 20:00

Add

Update

Clear

Doctor ID	Doctor Name	Specialty	Contact	Visiting Hours
D00001	Shaik Moha...	Cardiology	9854521475	TR 17:00 - ...

Click a record to update the details

Back to Main

## 11.Appointments

### Appointment Database

Search

Patient ID

Patient Name

Appointment Date

Doctor Name

Search

Clear

Appointment ID	Patient ID	Patient Name	Doctor Name	Appointment Date	Diagnosis	Prescription
A00001	P00001	Anna Todd	Shaik Mohamma...	2020-10-01	Fever	Crocin
A00002	P00002	Rick Morley	Smith Leo	2020-10-09		
A00004	P00007	Allina Maris	Anish Netri	2020-10-20		
A01010	P01500	Rick Hall	Tyrone Murray	2020-10-22		
A00006	P00010	Dewitt Adrianello	Skyler Monroe	2020-10-20		
A00008	P00008	Lib O'Giany	Skyler Monroe	2020-07-19	Activity, oth invol...	Monitor Skin/Bre...
A00200	P00200	Patrick Blemen	Skyler Monroe	2020-08-31	Poisoning by car...	Restrict L Radial ...
A00290	P00290	Matteo Paske	Skyler Monroe	2020-07-01	Anal sphincter te...	Supplement R Gl...
A00482	P00482	Lynsey Bodle	Skyler Monroe	2020-08-25	Ntrm subarach h...	Excision of C-tho...
A00572	P00572	Fabio Coyle	Skyler Monroe	2020-03-08	Leakage of indw...	Excision of Rectu...
A00764	P00764	Base Roelvink	Skyler Monroe	2020-07-09	Breakdown (mec...	Excision of Bladd...
A00854	P00854	Nicolai Gargett	Skyler Monroe	2020-02-12	Implant cysts of i...	Drainage of Mid ...
A00000	P00000	Benedetto Dagvelli	Kasimir Atkinson	2020-07-31	Other interstitial	Supplement R Lg...

Click a record to add/update the diagnosis and prescription for a patient

Diagnosis/Prescription

Back to Main

## 12.Diagnosis / Prescription

### Add Diagnosis/Prescription

Appointment... **A00008**

Diagnosis

Activity, oth involving dancing and other rhythmic movements

Prescript...

Monitor Skin/Breast Vasc Perfus, ICG dye, Extern

Add/Update

Clear

Close

GITHUB LINK :

[https://github.com/samyakpshetty/UE20CS352\\_PROJECT\\_HMS.git](https://github.com/samyakpshetty/UE20CS352_PROJECT_HMS.git)

