SOFTWARE REQUIREMENTS SPECIFICATION (SRS)

FOR

HEALTH CLINIC MANAGEMENT SYSTEM

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INTRODUCTION

This system is designed to improve patient and clinic staff experiences through seamless appointment scheduling, management, and communication

By leveraging modern technologies, the system ensures efficiency, accuracy, and user satisfaction

1.1 PURPOSE

The purpose of this project is to develop an integrated system for a multi-specialty clinic that includes all medical disciplines while offering an online registration system for patients. The system aims to enhance patient experience, improve operational efficiency, and ensure seamless access to healthcare services.

1.2 *SCOPE*

The project involves designing and developing a comprehensive digital solution for a **(HCMS)**, streamlining internal operations, and facilitating interaction between patients and doctors. The project includes the following components:

- **Online Registration:**
  - **Patient Registration:** Enables patients to create accounts and book appointments easily.
  - **Notifications:** Sends reminders about scheduled visits or updates.
  - **Payment Module:** Integration with various payment gateways (credit cards, debit cards)

Development Sides:

Desktop application:

Administrative dashboard for doctors and reception staff.

Comprehensive control panel to track appointments and medical records

- **Requirement:**

Patient Management:

Patient registration.

Appointment scheduling and reminders.

Medical history and prescription tracking.

Doctor Management:

- **Medical Records Management:** System for storing and updating patient files.
- **Reports and Analytic :** Providing performance insights to improve service quality.

Integrated Tools:

- **Monitoring System:** To track system performance and services
- **GPS Integration:** For providing navigation directions to the clinic.
- **Analytic Dashboard:** To monitor booking trends and clinic performance

1.3 DEFINITIONS, ACRONYMS, AND ABBREVIATIONS

- **HCMS:** Health Clinic Management System
- **SRS:** Software Requirements Specification

1.4 *REFERENCES*

Chapter 4 Software Engineering Book 9th Edition

1.5 OVERVIEW

The system enhances patient and clinic staff experiences by streamlining appointment scheduling, management, and communication. It utilizes modern technologies to ensure efficiency, accuracy, and user satisfaction.

2. OVERALL DESCRIPTION

Health Clinic Management System is a software application designed to streamline the process of scheduling and managing appointments for clinics. The system's primary purpose is providing an easy-to-use platform for managing appointments and patients' information.

This system aims to fix challenges such as overbooking, missed appointments, and lack of communication between patients and doctors and Nurses. By offering features like online appointment booking, real-time doctor availability updates, and automated notifications, the system ensures a seamless experience for all users.

The clinic appointment booking system will work in different environments, including mobile devices and web browsers, making it available to users anytime, anywhere.

2.1 ***PRODUCT PERSPECTIVE***

Health Clinic Management System is a software solution that fits into the clinic's existing operations. It works with different systems and components, such as:

Management Systems:
To retrieve and update doctor availability, patient records, and clinic schedules.

Patient Databases:
This database serves as the primary source for accessing patient records, ensuring that healthcare providers have timely and secure access to necessary data for effective treatment and care, it includes:
Personal Information such as contact details, and medical insurance.
Medical History that contains previous diagnoses, treatments, allergies, and any ongoing cases.
Appointment Logs, which record all patient appointments, including the doctor seen, date, and time.

Notification Systems:
To send SMS or email reminders for upcoming appointments or cancellations.

This system is designed to enhance the overall operational efficiency of clinics by reducing manual errors, providing real-time updates, and ensuring a smoother communication flow between patients and clinic staff. It is dependent on reliable internet connectivity, up-to-date databases, and secure data exchange protocols to ensure its functionality and security in handling sensitive healthcare information.

2.2 Product Features

Core Features:

1. Patient Registration:
   - Allow patients to create accounts with their personal and medical information.
   - Enable secure login and profile management.
2. Appointment Scheduling**:**
   - Display available appointment slots for each doctor.
   - Allow patients to book, reschedule, or cancel appointments.
   - Prevent double booking by managing real-time availability.
3. Doctor Management:
   - Enable clinic staff to register doctors and their specialties.
   - Set and manage doctors' schedules and availability.
4. Medical Record Integration:
   - Link appointments with patients' medical records for easy updates.

Additional Features:

a) Multi-Clinic Support:
- Manage appointments across multiple branches of a clinic.

b) Feedback Collection:
- Allow patients to rate their appointment experience and provide feedback.

c) Payment Integration (Optional):
- Enable online payment for consultation fees during booking.

d) Chat Support:
- Provide real-time assistance for patients.

2.3 USER CLASSES AND CHARACTERISTICS

1. Patients:

Role is :

- Primary users who book and manage their appointments.
- Characteristics:
- Wide range of Data (Age, Education, Health Problem).

Needs and Preferences:

- Intuitive and simple user interface for easy navigation.
- Notifications and reminders to avoid missing appointment.

2. Doctors:

Role:

- Healthcare providers who manage their schedules and view patient information.

Needs and Preferences:

- Quick access to schedules and patient details.
- User-friendly system to update availability and notes.

2.4 Operating Environment

- **Desktop Application:**
  - **Operating System:** Windows 10 and above.
  - **Hardware Requirements:** Minimum 4GB RAM, 64-bit processor, and 512MB free disk space.
  - **Development Framework:** Designed for desktops, specifically optimized for Windows.

2.5 DESIGN AND IMPLEMENTATION CONSTRAINTS

- **Programming Language:** Python
- **GUI Framework:** Tkinter in Python
- **Deployment:** Desktop-based executable file (.exe).
- **Database:** SQLite3 for local storage of patient and billing data.
- **Network Requirements:** Does not require internet connectivity unless integrating cloud storage or backup features.
- **Protocol / Standards:**
- Must adhere to **Windows UI Standards** for a consistent user experience.
- Navigation should support both mouse and keyboard inputs.
- **Device Dependency:** Runs exclusively on desktop or laptop computers

2.6 USER DOCUMENTATION

This section provides detailed user manuals and tutorials tailored for different user groups, including patients, clinic staff, and administrators.
The documentation will include step-by-step guides, FAQs, and video tutorials to ensure smooth onboarding and effective use of the system.

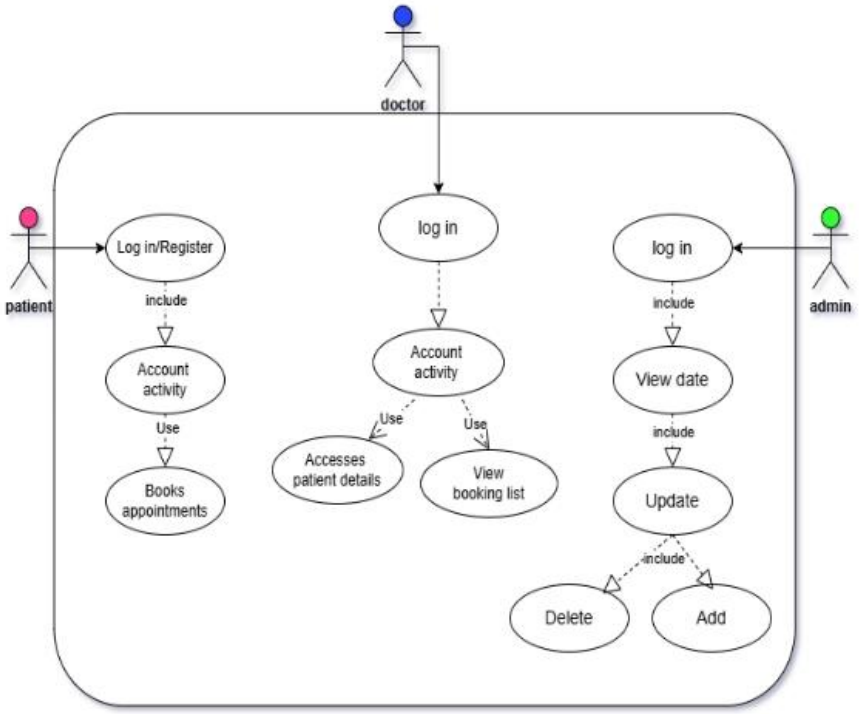
2.7 ***ASSUMPTIONS AND DEPENDENCIES***

This section outlines the assumptions and dependencies critical to the operation of the system.

- Assumptions:
- The clinic operates every workday, and the system will function accordingly during these periods.
- Users (patients and staff) have access to the internet and compatible devices to interact with the system.
- Dependencies:
- The system's operations rely on a stable and secure network connection for real-time updates and communication.
- All functionalities of the product depend on the availability and proper functioning of the database for storing and retrieving critical data.

3. USE CASE DIAGRAM WITH USE-CASE DESCRIPTIONS

3.1 *USE CASE DIAGRAM:*



3.2 *USE-CASE DESCRIPTIONS*

Use case -ID:	UC_1
Usa caseName:	Log in/Register
Created By:	Mohamed Ashraf , Anas Mohamed
Date Created:	7/12/2024
Actors:	Patient, Doctor, Admin
Description:	Allows users to log in or register for a patient only, based on their role (Patient/Doctor/Admin).
Preconditions:	User has valid login credentials or needs to register.
Postconditions:	User successfully registered or logged in.
Priority:	High.

Use case -ID:	UC_2
Usacase Name:	Account Activity
Created By:	Eman Mohamed ,Mohamed Ahmed
Date Created:	10/12/2024
Actors:	Patient, Doctor
Description	View account activity including appointment details or bookings.
Preconditions:	User is logged in.
Postconditions:	Account details are displayed clearly.
Priority:	Medium

Use case -ID:	UC_3
Usacase Name:	Book Appointments
Created By:	Mohamed Ashraf , Eman Mohamed , Mariam Ahmed
Date Created:	12/12/2024
Actors:	Patient
Description	Allows patients to book appointments with the appropriate doctor.
Preconditions:	User is logged in and activated.
Postconditions:	Booking appears in the appointment list.
Priority:	High

Use case -ID:	UC_4
Usa caseName:	Access Patient Details
Created By:	Mohamed Ashraf, Mohamed Ahmed
Date Created:	15/12/2024
Actors:	Doctor
Description	View patients' data related to their appointments.
Preconditions:	Doctor is logged in.
Postconditions:	Doctor can view the details.
Priority:	High

Use case -ID:	UC_5
Usacase Name:	View Booking List
Created By:	Mohamed Ashraf, Mariam Ahmed
Date Created:	27/12/2024
Actors:	Doctor
Description	View the list of their bookings.
Preconditions:	Doctor is logged in.
Postconditions:	A clear list of bookings is displayed.
Priority:	Medium

Use case -ID:	UC_6
Usacase Name:	View Data
Created By:	Anas Mohamed, Mohamed Ashraf, Ali Fathy
Date Created:	27/12/2024
Actors:	Admin
Description	View details of appointment dates.
Preconditions:	Admin is logged in.

Postconditions:	Required dates are displayed.
Priority:	Low

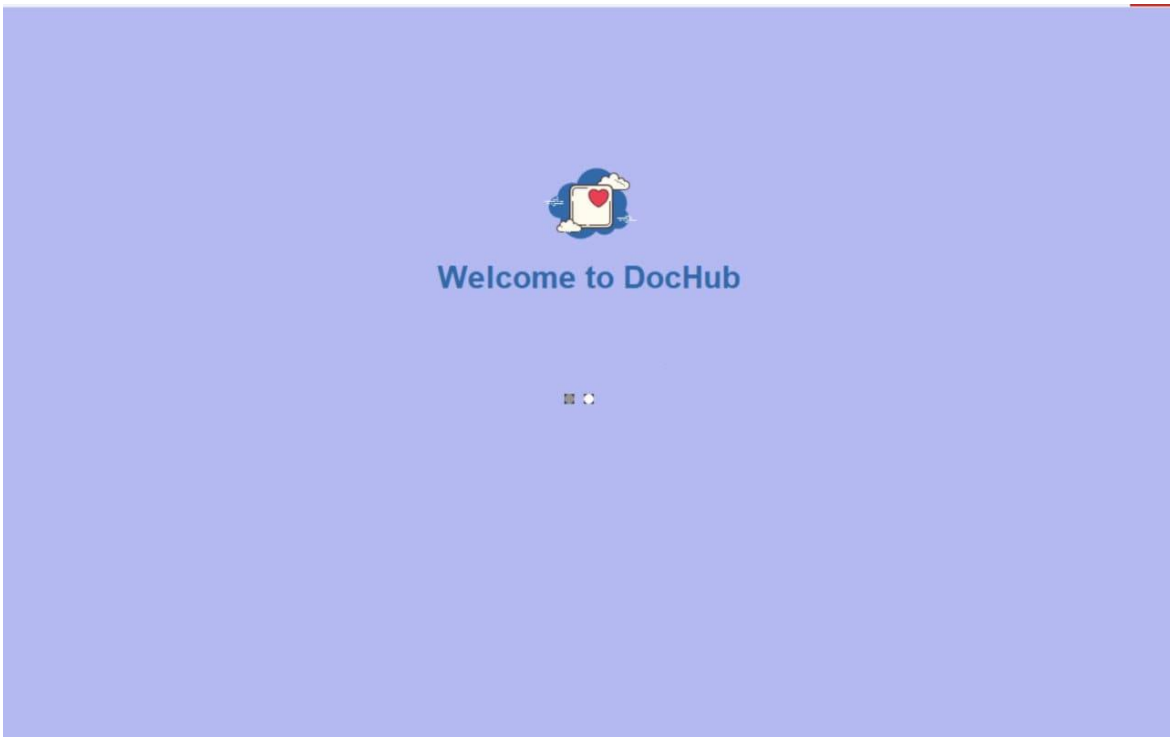
Use case -ID:	UC_7
Usa caseName:	Update
Created By:	Anas
Date Created:	27/12/2024
Actors:	Admin
Description	Update data in the appointment or user system.
Preconditions:	Admin is logged in.
Postconditions:	Data is updated successfully.
Priority:	High

Use case -ID:	UC_8
Usa caseName:	Add
Created By:	Anas Mohamed , Ali Fathy
Date Created:	27/12/2024
Actors:	Admin
Description	Add new users or data to the system.
Preconditions:	Admin is logged in.
Postconditions:	Data is added to the system.
Priority:	High

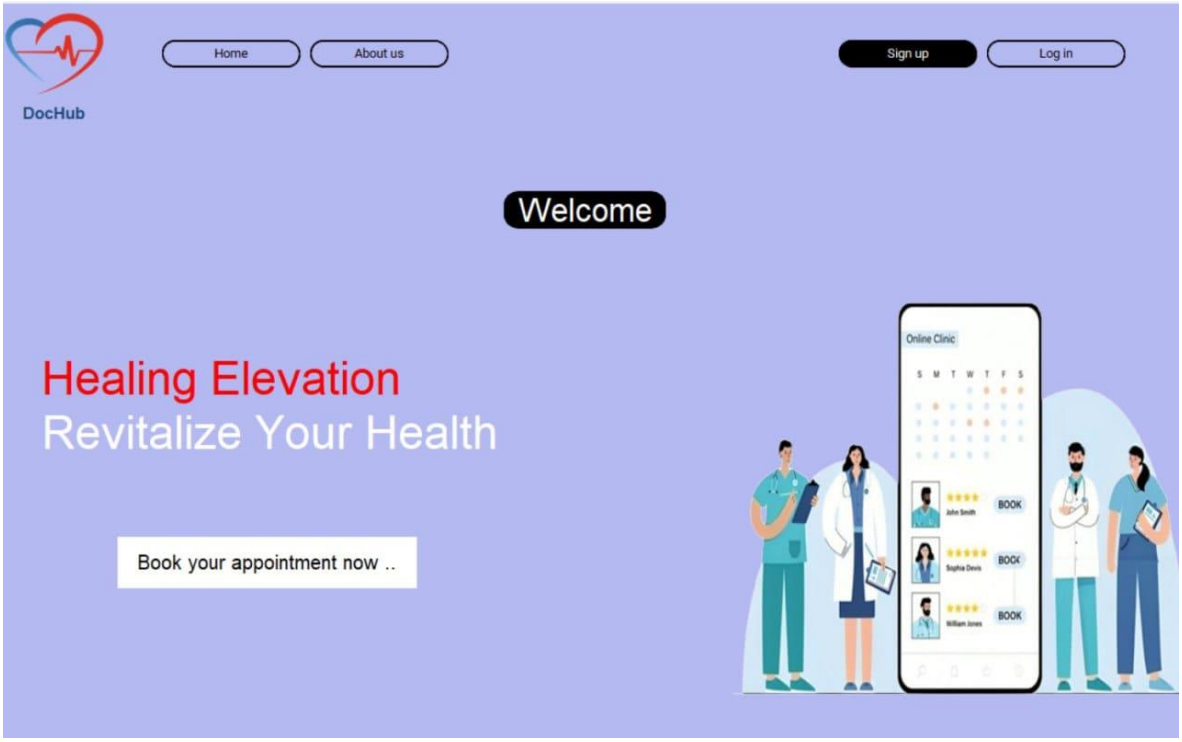
Use case -ID:	UC_9
Usa caseName:	Delete
Created By:	Anas Mohamed
Date Created:	27/12/2024
Actors:	Admin
Description	Delete user or item data from the system.
Preconditions:	Admin is logged in.
Postconditions:	Selected item is deleted.
Priority:	Medium

4. ***EXTERNAL INTERFACE REQUIREMENTS***

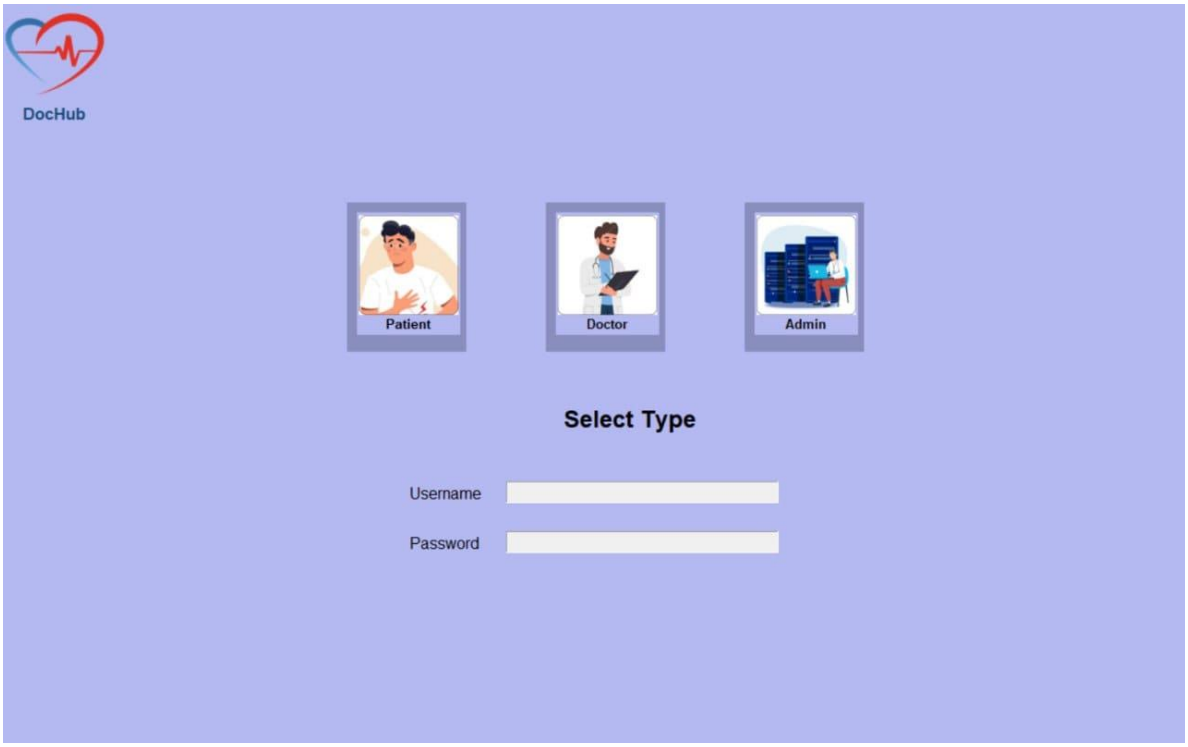
4.1 ***User interfaces***



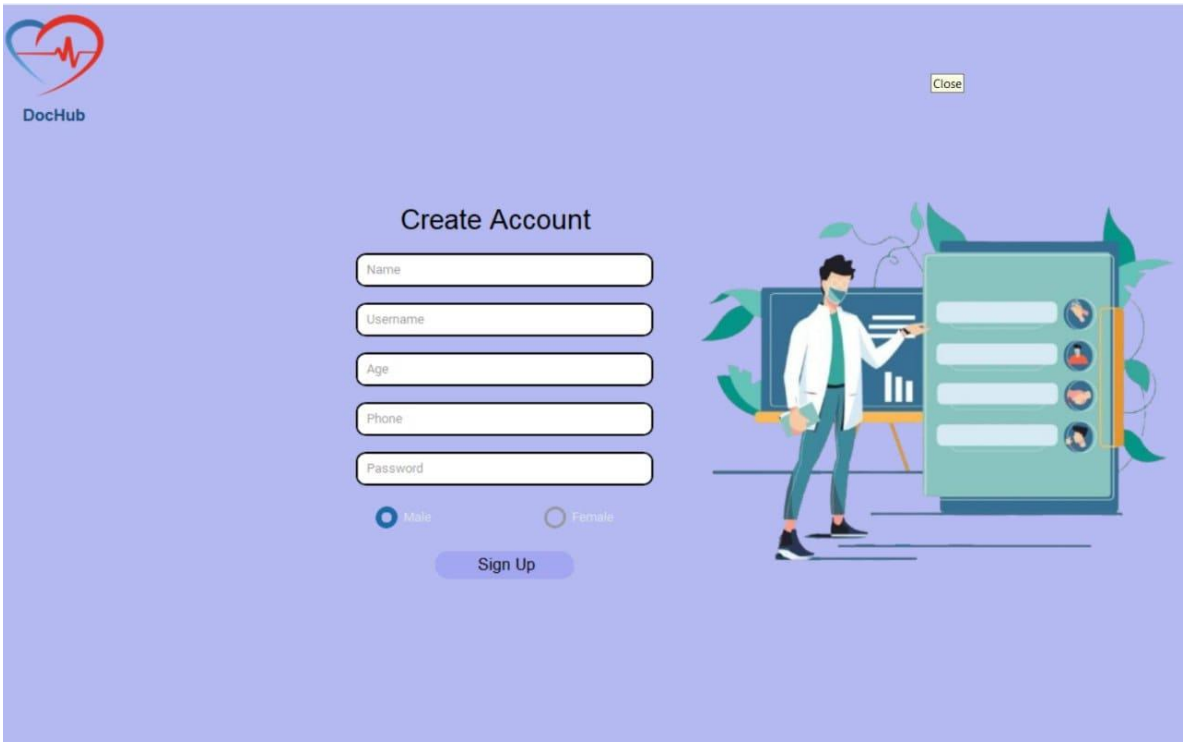
Welcome page



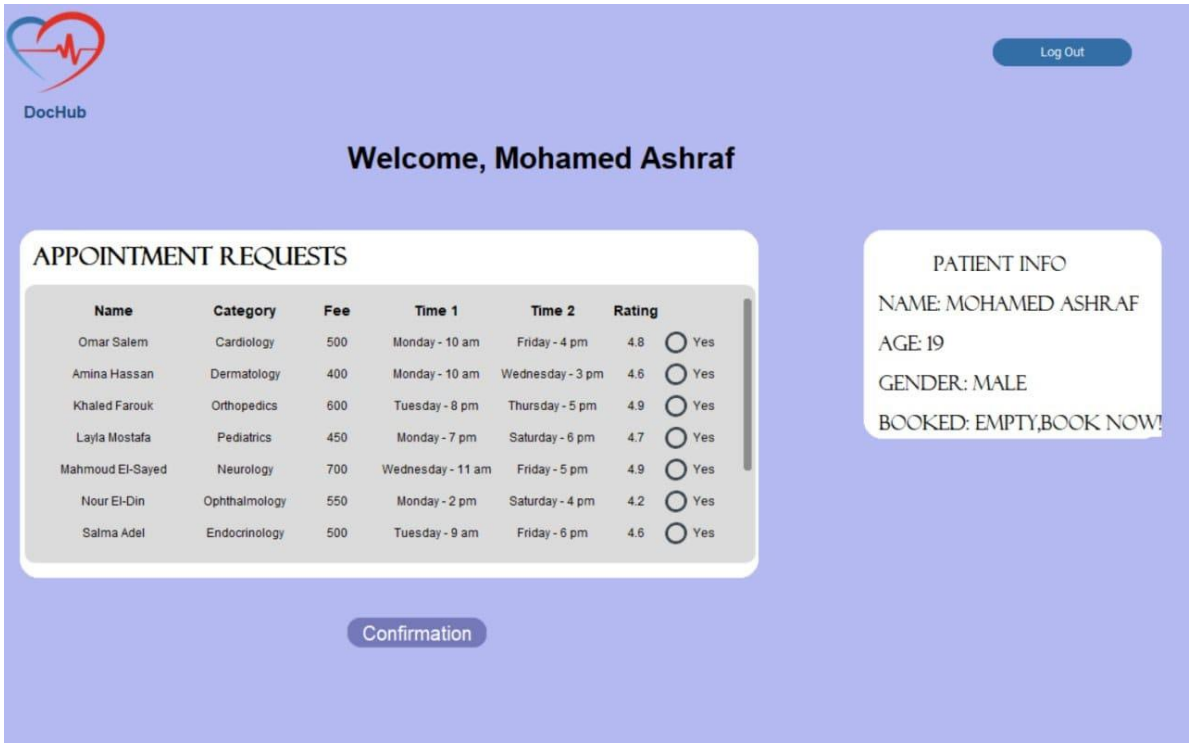
Home page



Log in page

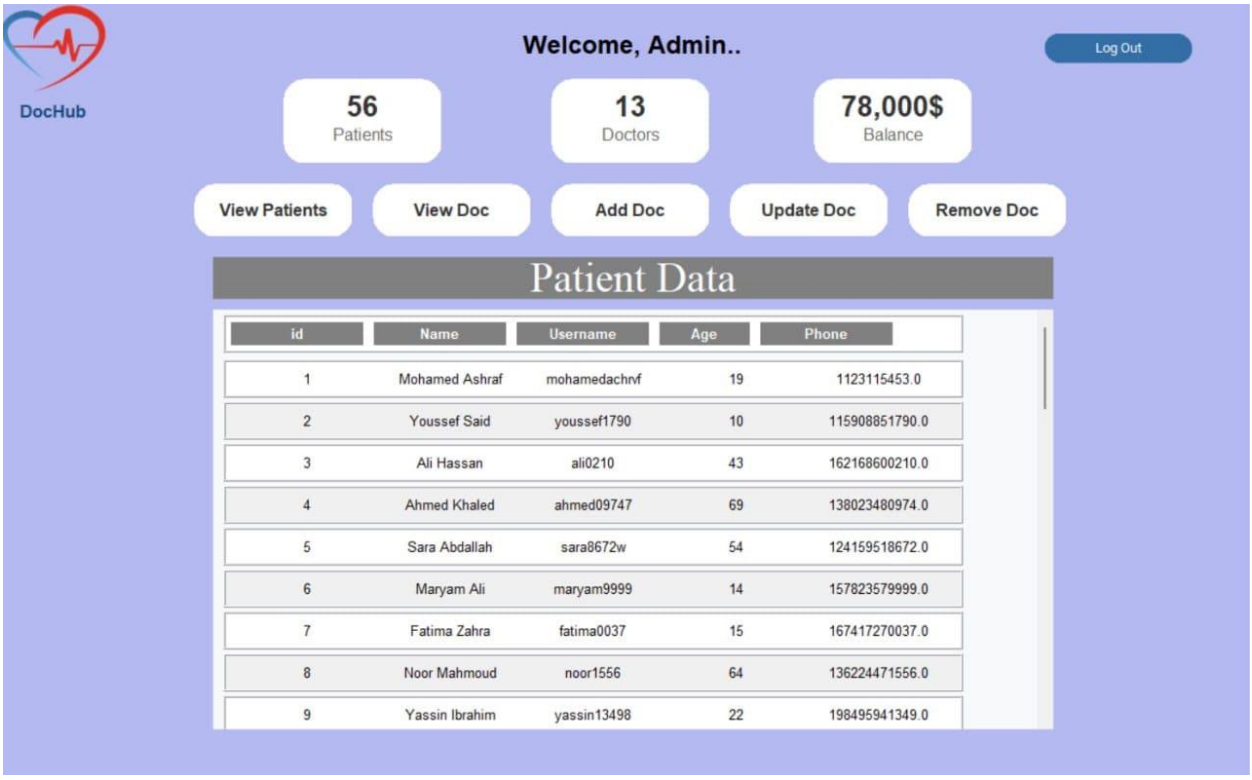


Sign up page



Patient page

Doctor page



Admin page

4.1 Software Interfaces

We have used some external libraries in our program to improve it

Like :

SQLite3 -> database

Tkinter -> gui

Custom_Tkitner -> gui

OS -> Operating System

PIL -> Handling Images

5. OTHER NONFUNCTIONAL REQUIREMENTS

5.1 Performance Requirements

The system must handle up to 20 concurrent users in a local network environment.
The system's response time for operations (e.g., loading patient records) should be less than 2 seconds.

5.2 Safety Requirements

Display alerts for critical patient conditions or missing data when accessing records.
Prevent accidental deletion of patient data by implementing confirmation dialogs.

5.3 Security Requirements

Store sensitive data (e.g., patient details) in an encrypted SQLite database.
Restrict access to system functionalities through user authentication.

5.4 Software Quality Attributes

The application must be operational during business hours (e.g., 8 AM to 8 PM).
The executable file size should not exceed 100 MB.

6. OTHER REQUIREMENTS

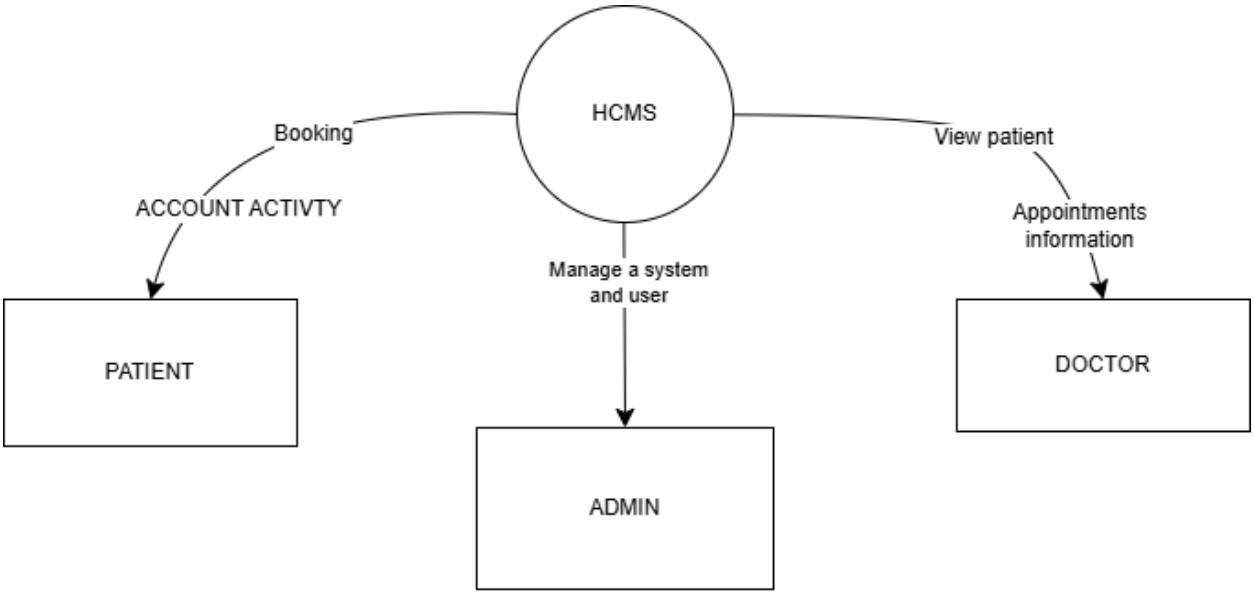
OR-1: The user can set the Application to his/her preferred language. (English or German)

OR-2: We should use cache to speed up our application

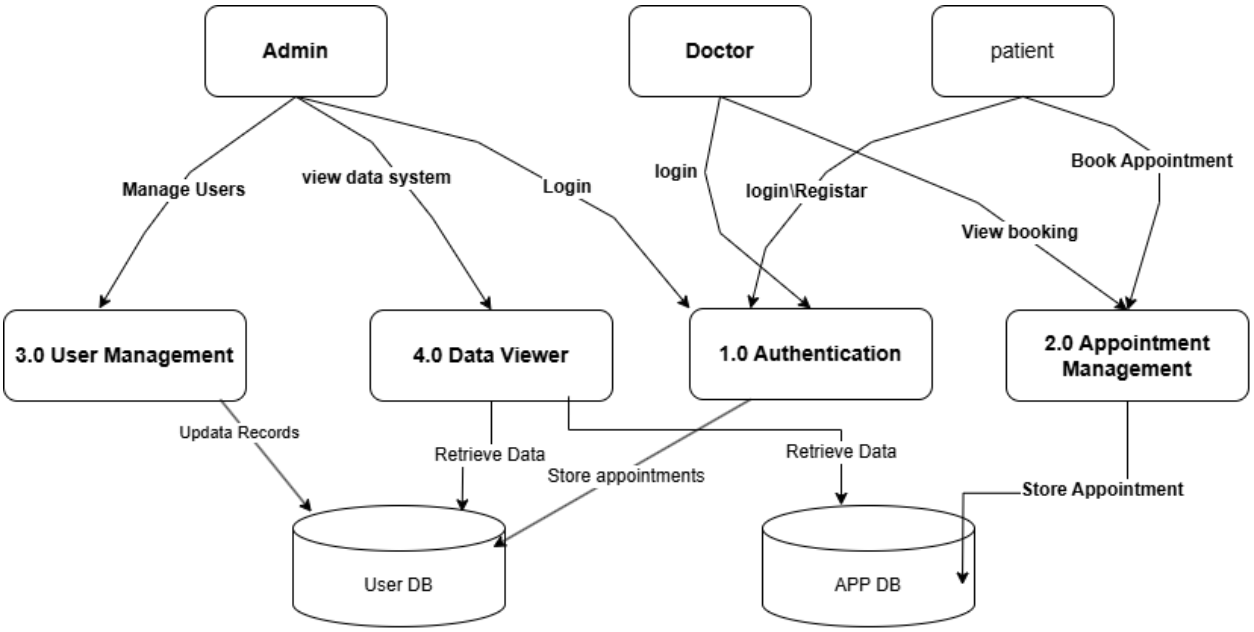
7. ***DATA FLOW DIAGRAM***

There are three levels of Data Flow Diagrams, they are as follows

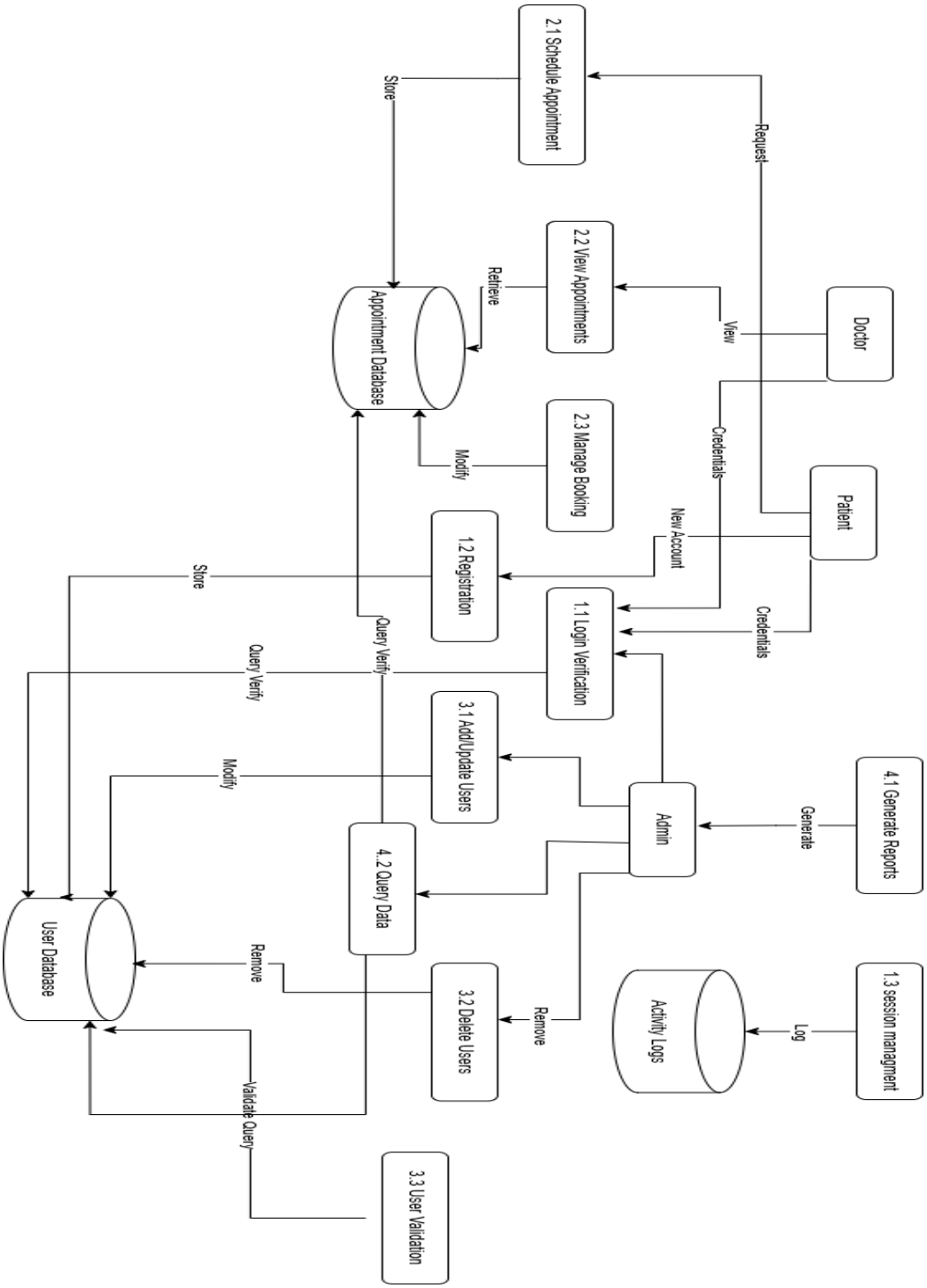
7.1 LEVEL 0 DATA FLOW DIAGRAM



7.2 LEVEL 1 DATA FLOW DIAGRAM



7.3 LEVEL 2 DATA FLOW DIAGRAM



8. Process Specification

8.1 Patient Registration

ID	1
NAME	PATIENT REGISTRATION
DESCRIPTION	PATIENT REGISTRATION IS A PROCESS WHEN PATIENT SIGN UP WITH THEIR PERSONAL INFO OR LOGIN IN WITH USERNAME AND PASSWORD ALREADY
INPUT DATA FLOW	USERNAME, AGE, GENDER, PAYMENT, DOCTOR'S NAME
OUTPUT DATA FLOW	CONFIRMATION OF : DOCTOR'S NAME , APPOINTMENT TIME
TYPE OF PROCESS	MANUAL
TYPE OF PROCESS	STRUCTURED ENGLISH
UNRESOLVED ISSUES	PATIENTS MIGHT PROVIDE INCOMPLETE OR INCORRECT INFORMATION DUE TO MISUNDERSTANDING FIELDS

If patient clicked on sign up button:

They will move to a page to enter their personal information like name, age, gender and set password.

Else:

If clicked on log in button:

Other page will be opened to just enter username and password.

End if

Patient should choose doctor and appointment time that will appear for them, check doctor's rate and confirm reservation.

8.2 Doctor login

ID	2
NAME	DOCTOR LOGIN
DESCRIPTION	THE DOCTOR IS ALREADY SIGNED UP BY SYSTEM , ONLY CAN LOGIN
INPUT DATA FLOW	USERNAME , PASSWORD
OUTPUT DATA FLOW	DOCTOR'S SCHEDULE
TYPE OF PROCESS	MANUAL
TYPE OF PROCESS	STRUCTURED ENGLISH
UNRESOLVED ISSUES	DOCTOR CAN FORGET THEIR PASSWORD OR NEED TO UPDATE NEW ONE

If doctor clicked login in button:

They will move to a page to enter their username and password

End if

The doctor's schedule is on his profile, including patients on his schedule, their information and time of appointment.

8.3 Admin login

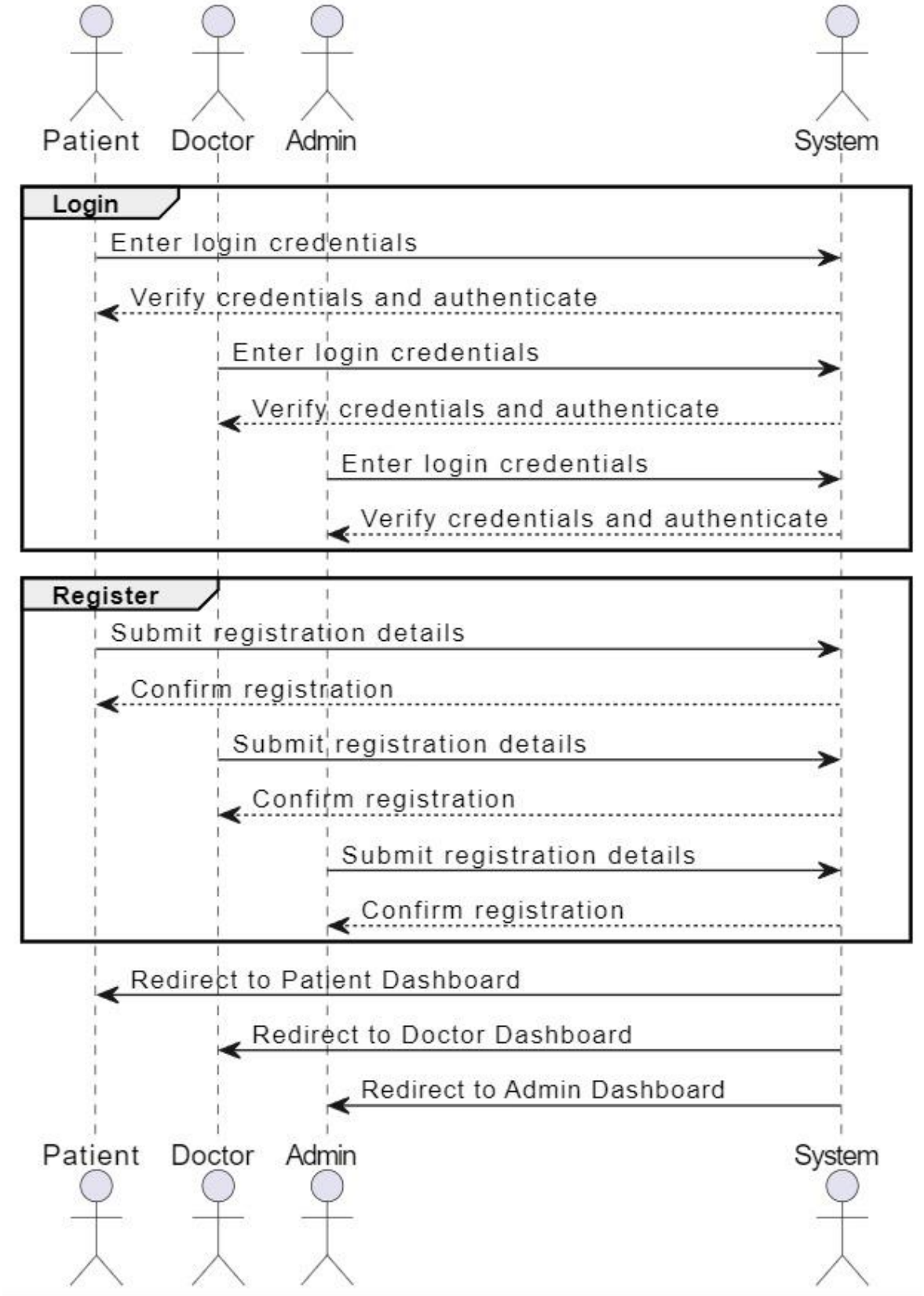
ID	3
NAME	ADMIN LOGIN
DESCRIPTION	ADMIN LOGIN TO SYSTEM TO CHECK, FIX AND EDIT THE SYSTEM
INPUT DATA FLOW	USERNAME , PASSWORD
OUTPUT DATA FLOW	ADMIN PROFILE
TYPE OF PROCESS	MANUAL
TYPE OF PROCESS	STRUCTURED ENGLISH
UNRESOLVED ISSUES	ADMIN ACCOUNTS ARE PRIME TARGETS FOR CYBERATTACKS, SUCH AS PHISHING, BRUTE FORCE, OR CREDENTIAL STUFFING.

If admin clicked log in:

They will move to a page where they can check system, add or delete a doctor or update doctor's salary.

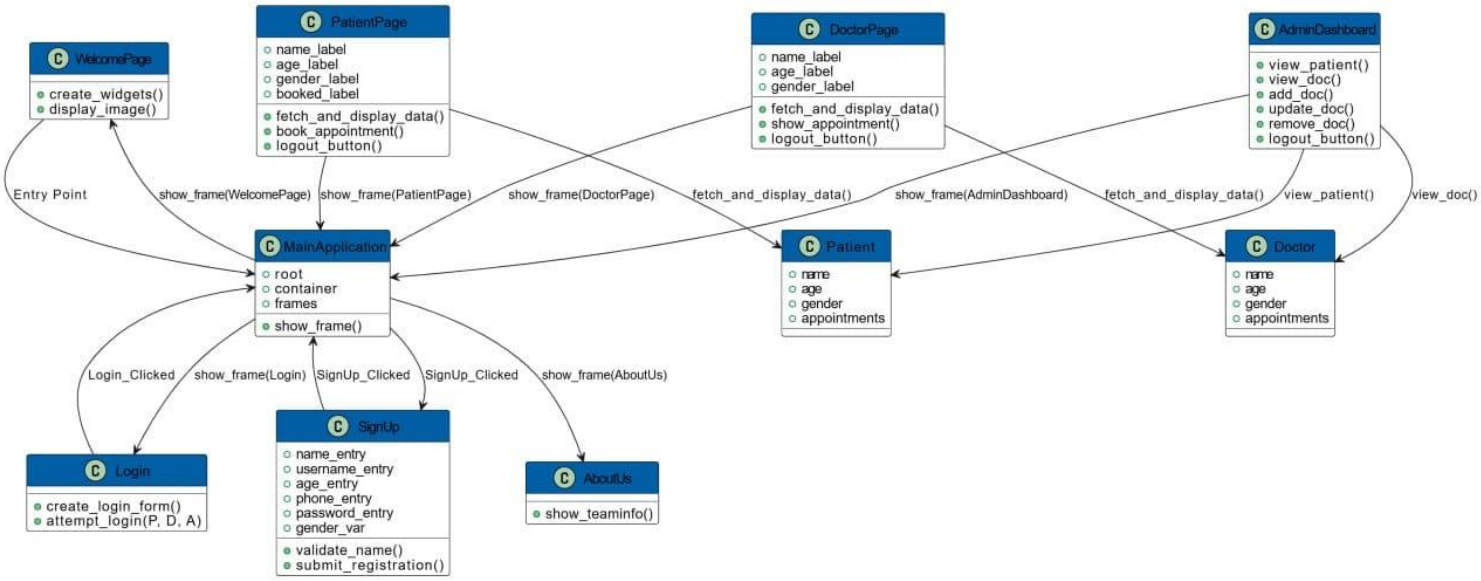
End if

9.SEQUENCE DIAGRAM



10. CLASS DIAGRAM

10.1 Modified Class Diagram



10.2 Detailed Class Diagram