

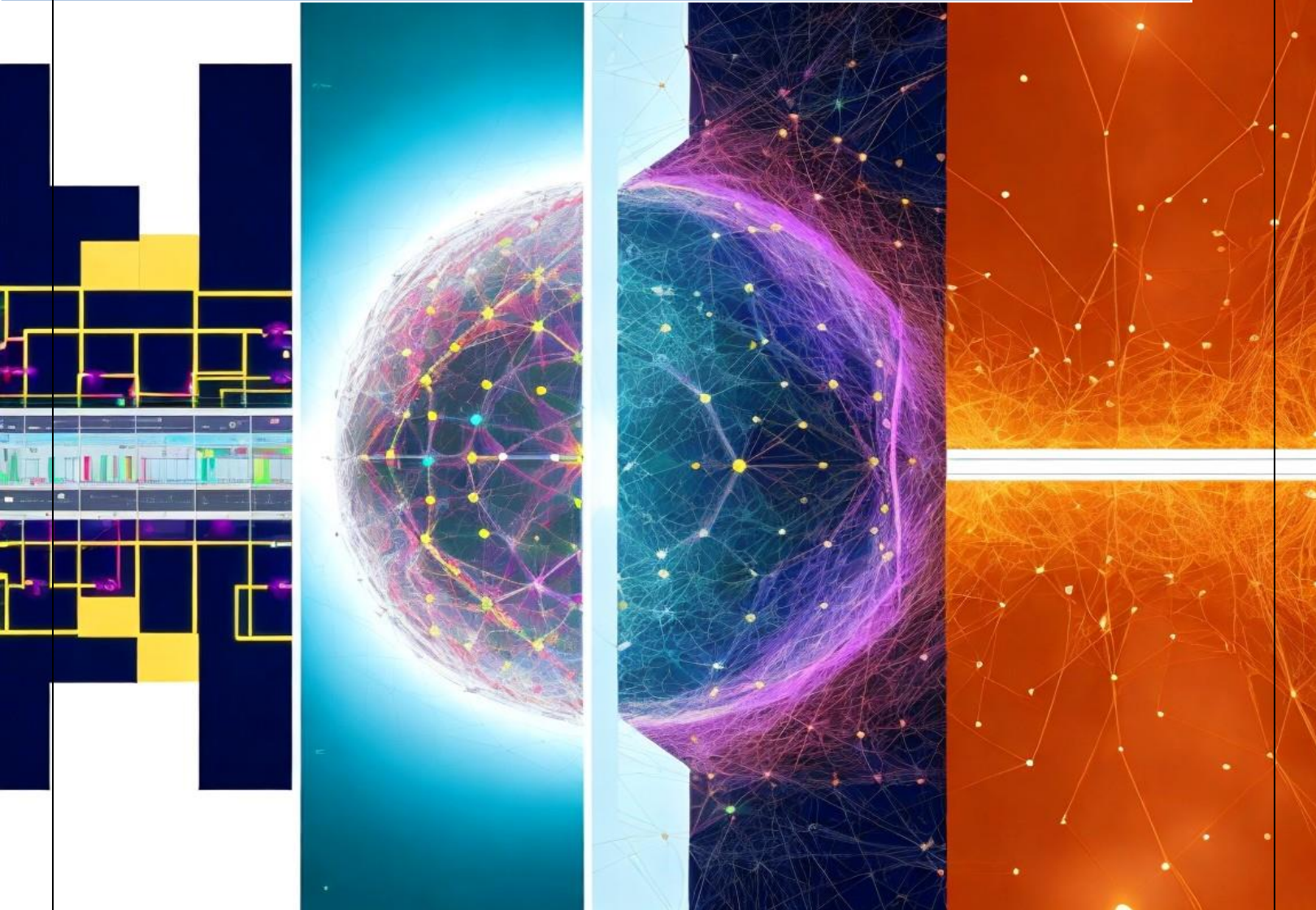
SE02

Chathura Dinuwan

UGC0223021

SE02

Clinical Management System.



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Clinical Management System UGC0223021

INTRODUCTION

The Clinical Management System represents a vital tool in modern healthcare, aiming to enhance the efficiency and effectiveness of medical practices through digitalization. Developed as a console-based application in C++, this system serves as a comprehensive platform for managing patient records, scheduling appointments, and facilitating communication between healthcare providers and patients. By providing essential features such as user authentication, patient record management, and appointment scheduling, the system empowers both doctors and patients to efficiently navigate the complexities of healthcare management.

In this project report, we delve into the design, implementation, and testing of the Clinical Management System, offering insights into its functionalities, technical architecture, and user interface. By documenting our development process, including challenges faced and solutions devised, we aim to provide a comprehensive overview of the system's capabilities and contributions to the healthcare industry.



User Documentation.

The Clinical Management System offers a user-friendly interface for doctors and patients to interact with the system efficiently. Below are the instructions for navigating through the system's functionalities:

User Authentication:

- Upon launching the application, users will be prompted to log in with their username and password.
- Ensure that your username and password are entered correctly to access the system.

Patient Functionalities:

View Medical Records:

- After logging in, patients can choose the "View Medical Records" option to see their personal information and appointment details.

Schedule Appointments:

- To schedule an appointment, select the "Schedule Appointments" option and follow the prompts to choose a doctor and appointment time.

Cancel Appointments:

- If you need to cancel an appointment, select the "Cancel Appointments" option and follow the prompts to cancel the desired appointment.

Update Personal Information:

- To update your contact details, select the "Update Personal Information" option and follow the prompts to make the necessary changes.

Doctor Functionalities.

View Schedule:

- Doctors can view their upcoming appointments by selecting the "View Schedule" option.

Access Patient Records:

- To access patient records, doctors can search for a patient by name and view their medical history and appointment details.

Update Patient Records:

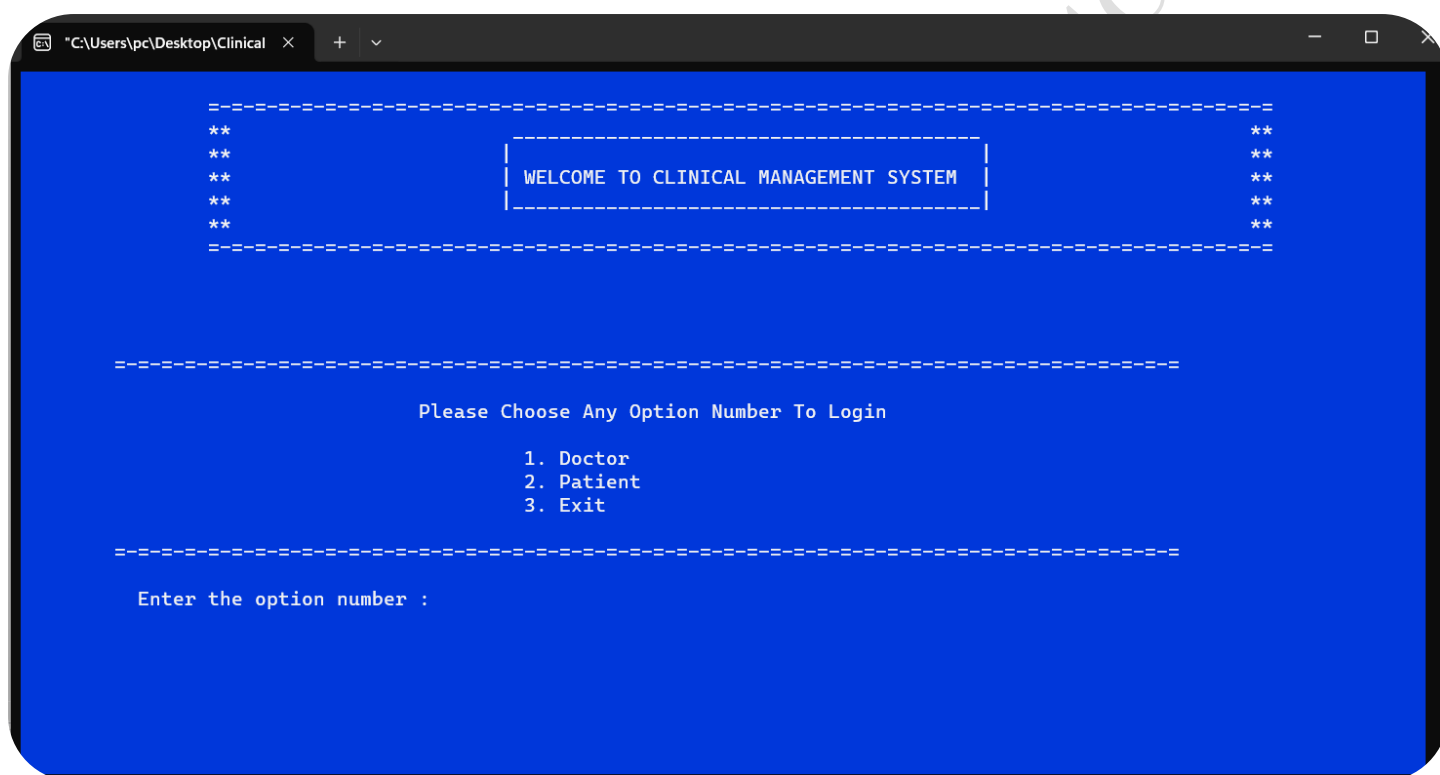
- After a consultation, doctors can update a patient's medical records by selecting the "Update Patient Records" option.

Mark Appointment as Complete:

- Once a consultation is finished, doctors can mark the appointment as complete using the "Mark Appointment as Complete" option.

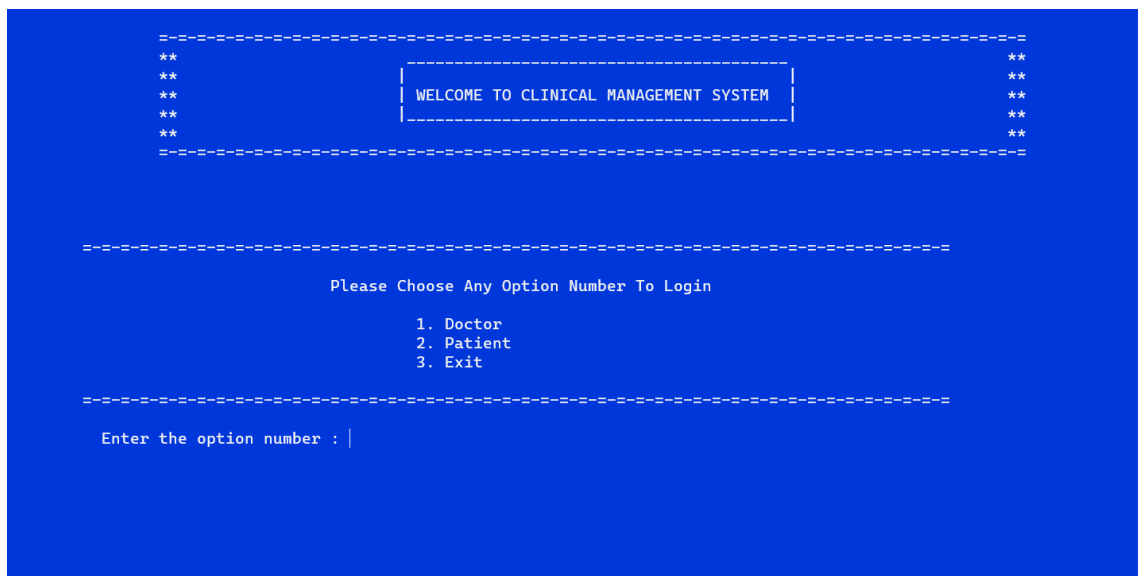
Error Handling:

- The system provides informative error messages to guide users in case of invalid inputs or errors.
- Follow the on-screen prompts and instructions to rectify any issues encountered during system usage.



User Manual.

Welcome Screen

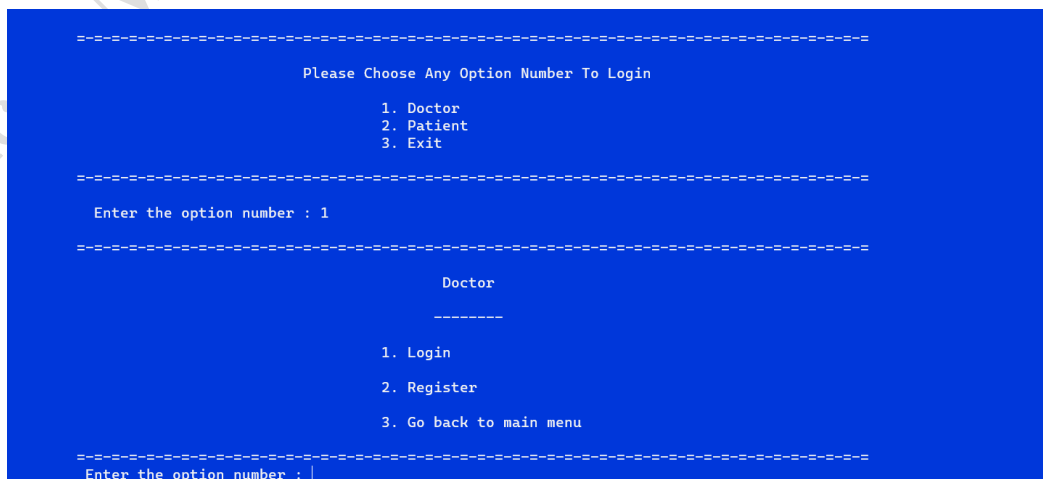


- ❖ Upon launching the application, you will be greeted with the welcome screen of the Clinical Management System.
- ❖ The welcome screen displays the system title and a menu with options to login as a doctor, patient, or exit the application.
- ❖ The text color is set to green, and the background color is set to white for better readability.

1. Login Options

- ❖ Choose an option number to proceed with the login process:
 - Enter "1" to login as a doctor.
 - Enter "2" to login as a patient.
 - Enter "3" to exit the application.

2. Doctor Login



- ❖ If you choose option "1" to login as a doctor, you will be directed to the Doctor Login Menu.
- ❖ Follow the prompts to enter your username and password to access the system. And you can register the system.
- ❖ Upon successful login, you will gain access to functionalities tailored for doctors, such as viewing schedules and accessing patient records.

3. Patient Login

```

**                                     **
**                                     **
**                                     **
**                                     **
**                                     **
=====
Please Choose Any Option Number To Login
1. Doctor
2. Patient
3. Exit
=====
Enter the option number : 2
=====
Patient
1. Login
2. Register as a patient
3. Go back to main menu
=====
Enter the option number :

```

- ❖ If you choose option "2" to login as a patient, you will be directed to the Patient Login Menu.
- ❖ Register as a patient and Enter your credentials to log in and access patient-specific functionalities, such as viewing medical records and scheduling appointments.

4. Exit Application

```

=====
**                                     **
**                                     **
**                                     **
**                                     **
**                                     **
=====
Please Choose Any Option Number To Login
1. Doctor
2. Patient
3. Exit
=====
Enter the option number : 3
Thank You!
Process returned 0 (0x0)   execution time : 173.669 s
Press any key to continue.

```

- ❖ Selecting option "3" will gracefully exit the application, displaying a "Thank You!" message.

5. Error Handling

- ❖ If you enter an invalid option or encounter any errors during the login process, the system will prompt you to select from the available options again.
- ❖ Follow the on-screen instructions and prompts to navigate through the application seamlessly.

DOCTOR LOGGING MENU

```
=====
                        Doctor
                    -----
                        1. Login
                        2. Register
                        3. Go back to main menu
=====
Enter the option number : |
```

- ❖ Upon accessing the Doctor Login Menu, you will be presented with a menu interface designed for doctors.
- ❖ The menu provides options for doctors to login, register, or return to the main menu.
- ❖ The text color is set to green, and the background color is set to white for better readability.

1. Login Option

```
Doctor Login
Enter The Username To Log In : Chathu
Enter The Password To Log In : *****|
```

- ❖ Choose option "1" to login as a doctor and access your account.
- ❖ Follow the prompts to enter your username and password and gain access to doctor-specific functionalities.

2. Registration Option.

```

=====
                        Doctor
                        -----
                        1. Login
                        2. Register
                        3. Go back to main menu

=====
Enter the option number : 2

                        Doctor Registration
                        -----
Enter Doctor Username : user
Enter Doctor Password: 123

Registration Successful!

=====

```

- ❖ If you are a new user and do not have an account yet, select option "2" to register as a doctor.
- ❖ Follow the registration process to create your account and gain access to the system.

3. Return to Main Menu

- ❖ If you wish to return to the main menu without logging in or registering, select option "3".
- ❖ This option allows you to explore other functionalities of the application.

4. Error Handling

- ❖ If you enter an invalid option or encounter any errors during the login process, the system will prompt you to select from the available options again.

DOCTOR LOGGING AND TASKS.

1. Doctor Login:

```

Doctor Login
Enter The Username To Log In : chathura
Enter The Password To Log In : *****
Your LOGIN is successful
    
```

```

Doctor Login
Enter The Username To Log In : wrong
Enter The Password To Log In : *****

LOGIN ERROR
Please check your Username and Password

Press any key to continue . . . |
    
```

- To access doctor-specific functionalities, begin by logging in with your username and password.
- Enter your username and password as prompted. The password input will be hidden for security.

2. Doctor Tasks Menu:

```

Doctor Login
Enter The Username To Log In : chathura
Enter The Password To Log In : *****
Your LOGIN is successful

----- Doctor TASKS -----
1. Update Available Time
2. View Appointment Sheduld
3. Medical records
4. Update appointment status
5. Add Your Details and working days
6. Go Back To Main Menu
-----

Enter the option number : |
    
```

- After successful login, you will be presented with the Doctor Tasks Menu.
- The menu provides options for various tasks that doctors can perform within the Clinical Management System.

3. Task Options:

- **Update Available Time (Option 1):**
 - Use this option to update your available time slots for appointments.

- **View Appointment Schedule (Option 2):**
 - View your appointment schedule to see upcoming appointments and patient details.
- **Access Medical Records (Option 3):**
 - Access and manage medical records of patients, including diagnoses and prescribed medications.
- **Update Appointment Status (Option 4):**
 - Update the status of appointments, such as marking them as completed or rescheduled.
- **Add Doctor Details (Option 5):**
 - Add or update your personal details, including full name, specialty, and working days.
- **Return to Main Menu (Option 6):**
 - Return to the main menu to access other functionalities of the Clinical Management System.

4. Error Handling:

Please select from the given options

```

----- Doctor TASKS -----
1. Update Available Time
2. View Appointment Scheduld
3. Medical records
4. Update appointment status
5. Add Your Details and working days
6. Go Back To Main Menu
-----

```

Enter the option number : 9

- If you encounter any errors during login or task selection, the system will prompt you to select from the available options again.
- Follow the on-screen instructions and prompts to navigate through the Doctor Tasks Menu seamlessly.

Patient Logging menu.

```
=====
Please Choose Any Option Number To Login

1. Doctor
2. Patient
3. Exit

=====
Enter the option number : 2

=====
Patient

1. Login
2. Register as a patient
3. Go back to main menu

=====
Enter the option number :
```

1. Patient Login:

- To log in as a patient, select option 1 from the Patient Login Menu.
- Enter your username and password when prompted. The password input will be hidden for security.
- If the login credentials are correct, you will be logged into the system and directed to the Patient Tasks Menu.

2. Patient Registration:

```
----- Sign Up Patients -----
Enter The Name : Chathura Dinuwan
Enter The Email : testing@gmail.com
Enter The Username : username
Enter The Password : 12345

Patient Sign Up Is Successful
=====
Patient

1. Login
2. Register as a patient
3. Go back to main menu

=====
Enter the option number : |
```

- If you are a new patient and don't have an account yet, choose option 2 from the Patient Login Menu to register.
- Follow the prompts to provide your name, email, desired username, and password.
- Once the registration process is complete, you will receive a confirmation message, and you can proceed to log in with your new credentials.

3. Return to Main Menu:

- At any time, you can choose option 3 to return to the main menu of the Clinical Management System.
- This option allows you to navigate back to the main menu if you want to access other functionalities or exit the system.

Patient Logging And Tasks.

1. Patient Login:

```

Patient
The Username To Log In : pat
The Password To Log In : ***
LOGIN is successful

----- Patient TASKS -----
1. Add Appointment
2. Search Appointment
3. Delete Appointment Details
4. Check available doctors
5. Medical Records
6. Go Back To Main Menu

Enter the option number : |

```

Successfull Login

```

Patient
Enter The Username To Log In : user
Enter The Password To Log In : ****

LOGIN ERROR
Please check your Username and Password

Press any key to continue . . . |

```

When credentials are wrong

- Begin by logging in with your username and password to access patient-specific functionalities.
- Enter your username and password as prompted. The password input will be hidden for security.

2. Patient Tasks Menu:

```

Your LOGIN is successful

----- Patient TASKS -----
1. Add Appointment
2. Search Appointment
3. Delete Appointment Details
4. Check available doctors
5. Medical Records
6. Go Back To Main Menu

Enter the option number : |

```

- After successful login, you will be presented with the Patient Tasks Menu.

- The menu provides options for various tasks that patients can perform within the Clinical Management System.

3. Task Options:

- **Add Appointment (Option 1):**
 - Use this option to schedule a new appointment with a doctor.
- **Search Appointment (Option 2):**
 - Search for existing appointments by entering specific details such as date, time, or doctor's name.
- **Delete Appointment Details (Option 3):**
 - Delete any unwanted or canceled appointment details from the system.
- **Check Available Doctors (Option 4):**
 - View a list of available doctors and their availability for appointments.
- **Access Medical Records (Option 5):**
 - Access and review your medical records, including diagnoses, treatments, and prescribed medications.
- **Return to Main Menu (Option 6):**
 - Return to the main menu to access other functionalities of the Clinical Management System.

4. Error Handling

- If you encounter any errors during login or task selection, the system will prompt you to select from the available options again.

Console Based Clinical Management System.

Test Plan ID	Project 1
Brief Introduction about the system.	Console Based Clinical Management system
Test objectives	<ul style="list-style-type: none"> ❖ Input data by doctor and patient ❖ Error Handling ❖ Storing of Data ❖ Functional Coverage
Features to be tested	<ol style="list-style-type: none"> 1. Input data by doctor and patient: <ul style="list-style-type: none"> • Test the system's ability to accept and process patient and doctor information accurately. • Verify input validation and handling of various data types. 2. Error Handling: <ul style="list-style-type: none"> • Test how the system responds to invalid input and unexpected errors. • Verify the clarity and appropriateness of error messages. 3. Storing of Data: <ul style="list-style-type: none"> • Test the system's capability to securely store and retrieve data such as patient records and appointments. • Verify data integrity and persistence. 4. Functional Coverage: <ul style="list-style-type: none"> • Test the coverage of system functionalities, ensuring all features are thoroughly tested. • Verify functionality under different scenarios and use cases.
Test environment	Device : Dell Inspiron 3576 OS : Microsoft Windows 11 Software : CodeBlocks
Test approach	Black Box Testing
Testing tasks	<ul style="list-style-type: none"> ❖ Verify the system's response to various types of input, including valid and invalid data. ❖ Develop test cases to simulate error conditions such as invalid login credentials and file system errors. ❖ Create test cases to verify the storing and retrieval of patient and doctor data.
Test deliverables	Test Plan Test Cases
Schedule	2024/02/09 8.51 P.M

<u>TEST CASE</u>	
Test Unit : Doctor Register	Tester : Chathura Dinuwan
Test Case ID: 01	Test Type : Black box Testing
Test Description : Register as a doctor into a system already existed username	Test Execution Date : 9/02/2024
Title : Doctor Registration	Test Execution Time : 12.51 P.M

Evidence for test id 01.

```

=====
                        Doctor
                        -----
                        1. Login
                        2. Register
                        3. Go back to main menu
=====
Enter the option number : 2

Doctor Registration
-----
Enter Doctor Username : chathura
Error: Username already exists. Please enter a different username.
=====

```

<u>TEST CASE</u>	
Test Unit : Doctor Register	Tester : Chathura Dinuwan
Test Case ID: 02	Test Type : Black box Testing
Test Description : Register a doctor into a system	Test Execution Date : 9/02/2024
Title : Doctor Registration	Test Execution Time : 12.55 P.M

Evidence for test id 02.

```

Doctor Registration
-----
Enter Doctor Username : dinu123
Enter Doctor Password: 123

Registration Successful!
=====
  
```

<u>TEST CASE</u>	
Test Unit : Doctor Login	Tester : Chathura Dinuwan
Test Case ID: 03	Test Type : Black box Testing
Test Description : login a doctor into a system	Test Execution Date : 9/02/2024
Title : Doctor login	Test Execution Time : 01.20 P.M

Evidence for test id 03.

```

Doctor Login
Enter The Username To Log In : dinu123
Enter The Password To Log In : ***
Your LOGIN is successful

----- Doctor TASKS -----
1. Update Available Time
2. View Appointment Sheduld
3. Medical records
4. Update appointment status
5. Add Your Details and working days
6. Go Back To Main Menu
-----

Enter the option number : |
  
```

<u>TEST CASE</u>	
Test Unit : <i>Doctor login</i>	Tester : <i>Chathura Dinuwan</i>
Test Case ID: <i>04</i>	Test Type : <i>Black box Testing</i>
Test Description : <i>login a doctor into a system using wrong credentials</i>	Test Execution Date : <i>9/02/2024</i>
Title : <i>Doctor Login</i>	Test Execution Time : <i>2.21 P.M</i>

Evidence for test id 04.

```

                Doctor Login

Enter The Username To Log In : Dinu
Enter The Password To Log In : ***

LOGIN ERROR
Please check your Username and Password

Press any key to continue . . . |

```

TEST CASE

Test Unit : Add Doctor Details	Tester : Chathura Dinuwan
Test Case ID: 05	Test Type : Black box Testing
Test Description : Adding Doctor Details and saving and updating available doctor	Test Execution Date : 9/02/2024
Title : Doctor Details	Test Execution Time : 2.30 P.M

Evidence for test id 05.

```

Enter Docter ID : 01
Enter Speciality : Cardiology
Enter Your Full Name : Dr.Chathura Dinuwan
Enter Your Mobile Number : 0789377618
Enter Available Dates (Weekdays or weekends) : Weekdays
Enter Available time (morning/noon/night): night
Detail Entered Successfully!

```

❖ Entered Successfully

```

File Edit View
|
01 | Cardiology | Dr.Chathura Dinuwan | 789377618 | Weekdays | night | -

```

❖ Saved successfully

```

----- Display Doctors and available time Menu -----
1. Display all doctors and times
2. Search
-----
Enter the option number : 1

=====
Doctor ID | Speciality | Name | Mobile Number | Available Days | Available Time | Status
=====
01 | Cardiology | Dr.Chathura Dinuwan | 789377618 | Weekdays | night | -
=====

```

❖ Updated successfully.

```

----- 1. Go Back To Patient Task Menu -----
----- 2. Go Back To Main Menu -----
Enter the option number :

```

TEST CASE

Test Unit : Register As a patient and login	Tester : Chathura Dinuwan
Test Case ID: 06	Test Type : Black box Testing
Test Description : registering as a patient and log into system	Test Execution Date : 9/02/2024
Title : Patient registering and login	Test Execution Time : 2.40 P.M

Evidence for test id 06.

```

----- Sign Up Patients -----
Enter The Name : janodh dissanayaka
Enter The Email : janodh12@gmail.com
Enter The Username : janodh123
Enter The Password : 123

Patient Sign Up Is Successful
=====
Patient
1. Login
2. Register as a patient
3. Go back to main menu
=====
Enter the option number : |

```

❖ Registering

```

Patient
Enter The Username To Log In : janodh
Enter The Password To Log In : ***

LOGIN ERROR
Please check your Username and Password

Press any key to continue . . . |

```

```

Patient
Enter The Username To Log In : janodh123
Enter The Password To Log In : ***

Your LOGIN is successful

----- Patient TASKS -----
1. Add Appointment
2. Search Appointment
3. Delete Appointment Details
4. Check available doctors
5. Medical Records
6. Go Back To Main Menu
-----
Enter the option number : |

```

❖ Logging

TEST CASE

Test Unit : Add an appointment	Tester : Chathura Dinuwan
Test Case ID: 07	Test Type : Black box Testing
Test Description : add an appointment as a patient	Test Execution Date : 9/02/2024
Title : Appointment	Test Execution Time : 2.55 P.M

Evidence for test id 07.

```

----- Adding An Appointment -----
1.Press 1 to see doctor list
2.Press 2 to Continue
3.Press 3 to patient menu

enter your option :
2
Enter the patient full Name : janodh dissanayaka
Enter your ID : 2003
Enter the contact number : 0786541233
Enter Your Blood Group : AB-
Enter Doctor Id Number : 01
Enter the appointment day : 15
Enter the appointment month : 65
Enter the appoinment year : 2300
Invalid Date. Please re-enter the date.
Enter the appointment day : 02
Enter the appointment month : 05
Enter the appoinment year : 2024
Appointment Have Been Successfully Added

----- 1. Go Back To Patient Task Menu -----
----- 2. Go Back To Main Menu -----
Enter the option number : |

```

TEST CASE

Test Unit : <i>View Appointment as a doctor</i>	Tester : <i>Chathura Dinuwan</i>
Test Case ID: <i>08</i>	Test Type : <i>Black box Testing</i>
Test Description : <i>View an appointment as a doctor</i>	Test Execution Date : <i>9/02/2024</i>
Title : <i>Appointment</i>	Test Execution Time : <i>3.35 P.M</i>

Evidence for test id 08.

```

----- Appointment Search Menu -----
1. Display all
2. Search
3. Update
-----
Enter the option number : 2
Enter the appointment name or ID to find the appointment : 2003

===== ID | NAME
EMAIL | CONTACT NUMBER | JOINED DATE
=====
2003 | janodh dissanayaka | AB- | 786541233 | 2/5/2024 | 1New Appointment
=====

```

Step No	Test Step	Test Case Id	Test Input	Expected Result	Actual Result	Test Result (Pass/Fail)
01	Registering as doctor	02	Username : dinu123 Password:123	Successfully registered and redirect to doctor login menu	Successfully registered and redirect to doctor login menu	PASS
02	Login as a doctor	03	Username : dinu123 Password:123	Successfully login and show doctor tasks	Successfully login and show doctor tasks	PASS
03	login a doctor into a system using wrong credentials	04	Username : Dinu Password:123	Display background turn into black fonts turn into red and show credentials invalid message.	Displayed background turn into black fonts turn into red and show credentials invalid message.	Pass
04	Register as a doctor using already exist username	01	Username : chathura	Show already exist message and redirect to register menu	Successfully Showed already exist message and redirected to register menu	Pass
05	Adding Doctor Details and saving and updating available doctor	05	Doc id :01 Speciality : Cardiology Name: Dr.Chathura Dinuwan Number : 789377618 Working days : Weekdays Time: night	Show Successfully added message and Update of doctor.txt file and instant update of system and after redirect to doctor task menu	Show Successfully added message and Update of doctor.txt file and instant update of system and after redirect to doctor task menu	PASS

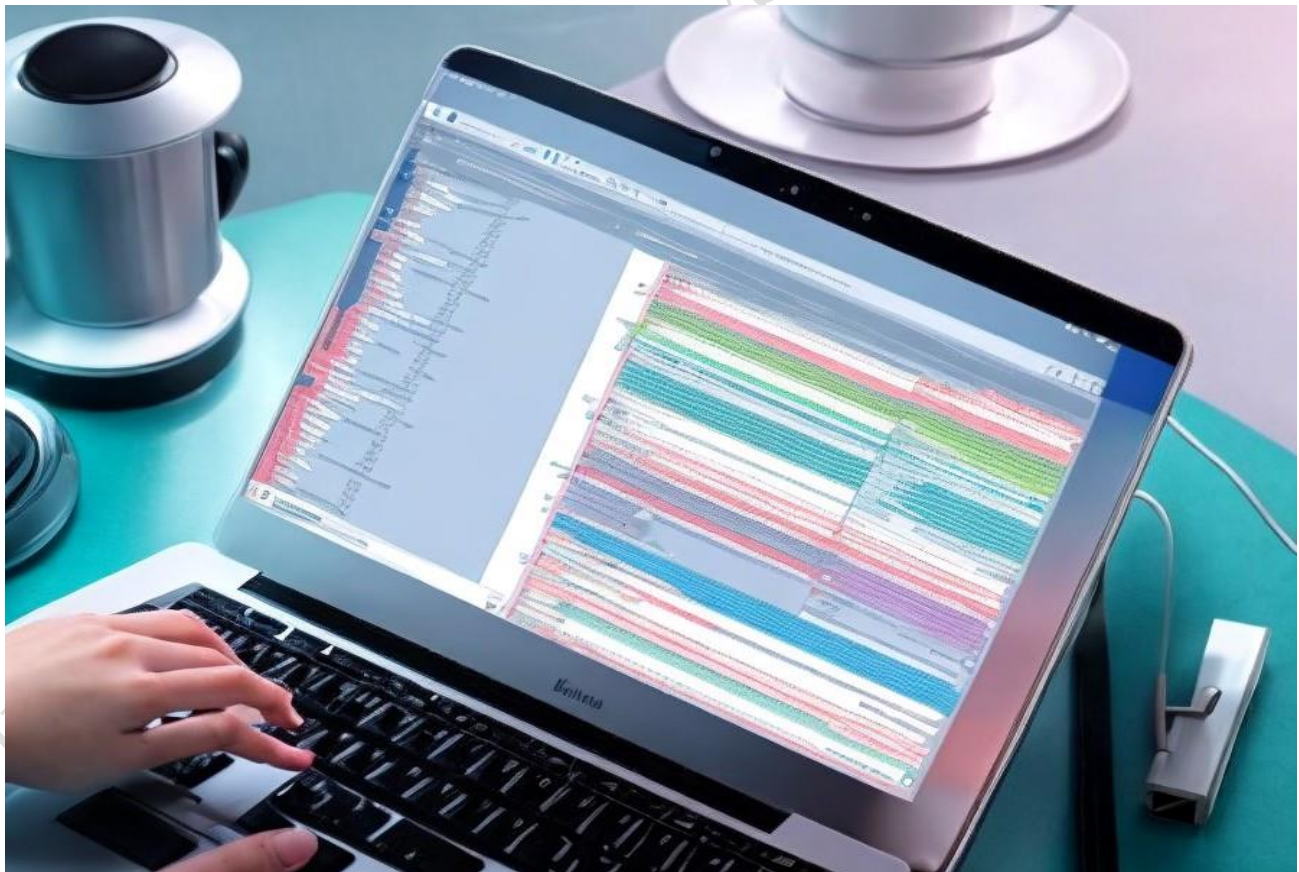
06	add an appointment as a patient	07	<p>appointment id: 2003</p> <p>Patient Name : janodh dissanayaka</p> <p>Patient blood group : AB-</p> <p>Patient mobile number: 786541233</p> <p>Appointment Date: 2/5/2024</p>	Successfully added message and redirect to patient task menu and saved that data to appointment.txt file and instant update of appointment list on system	Successfully showed Successfully added message and redirect to patient task menu and saved that data to appointment.txt file and instant update of appointment list on system	PASS
07	View appointment as a doctor	08	Appointment id : 2003	Show appointment	Show appointment	PASS

Results.

The C++ clinical management system effectively caters to both doctors and patients, offering essential features for medical record management and appointment scheduling. Thorough testing with provided test cases confirms the system's reliability in handling user interactions and data storage.

Patients benefit from features like viewing medical records, scheduling and canceling appointments, and updating personal information, empowering them to manage their healthcare efficiently. Likewise, doctors find the system useful for viewing schedules, diagnosing patients, and marking appointments as complete, streamlining their workflow.

By storing data in text files, the system ensures data persistence and accessibility, simplifying management and retrieval of doctor and patient information. Overall, the system meets basic requirements while offering room for future enhancements to usability and functionality.



END.

Clinical Management System UGC0223021