

**FACULTY OF COMPUTING AND INFORMATION TECHNOLOGY****AACS2204 OBJECT-ORIENTED PROGRAMMING TECHNIQUES****ASSIGNMENT****SEMESTER 202501**

Programme (Year & Group)	:	DCS1S3 Grp1
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Tutorial Group	:	1
Date Submitted	:	28 April 2025

No	Name	Student ID	Marks			Total Marks
			Section A	Section B	Section C	
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2	Tan Ying Nan	2401920				
3	Chia Zhen Yang	2402192				

**FACULTY OF COMPUTING AND INFORMATION TECHNOLOGY****AACS2204 OBJECT-ORIENTED PROGRAMMING TECHNIQUES**

Diploma in Computer Science (DCS)

Year 1 Semester 3

Group 1




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2	Tan Ying Nan	2401920		28 Apr 2025
3	Chia Zhen Yang	2402192		28 Apr 2025

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AACS2204 OBJECT-ORIENTED PROGRAMMING TECHNIQUES

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Date : 28 / 04 / 2025

Assignment Assessment Rubrics

No	<u>Student Name</u>	<u>Student ID</u>	<u>Final Marks</u>
1	Tan Wy Hang	2401976	
2	Tan Ying Nan	2401920	
3	Chia Zhen Yang	2402192	
4			

Programme of Study	D (CS)
Tutorial Group	Group (1)

CLO 2	Demonstrate an object-oriented program using appropriate programming fundamentals with regards to arrays, methods and exception handling. (P4, PLO3)									
Section A: Program Output & Correctness - Individual Marks (25 Marks)										
Task	Weight	Max. Marks	Excellent	Good	Average	Poor	Very Poor	Scores		Remarks
			5	4	3	2	1	(Point x Weight)		
Completeness of the program	2.0	10	Completed 100% of the functional requirements. All operations are implemented correctly.	Completed all of the functional requirements but implemented with minor errors.	Completed most of the functional requirements but implemented with errors.	Completed < 50% of the functional requirement and < 50% of the operations implemented correctly.	Did not complete any of the functional requirement at all	No	Marks	
								1		
								2		
								3		
								4		

Exception Handling	1.0	5	Output is correct with comprehensive exception handling.	Output is correct with appropriate exception handling.	Output is correct with little exception handling.	Output is somewhat correct with little proper exception handling.	Output is totally wrong with no proper exception handling.	No	Marks	
								1		
								2		
								3		
								4		
Design of the Output	1.0	5	Excellent formatted output. Program displays more than expected	Good formatted output and program displays as expected.	Appropriate output design and display as expected.	Poorly designed output.	Minimum to no formatted output with messy display.	No	Marks	
								1		
								2		
								3		
								4		
Program Code Quality & Standard	1.0	5	All identifiers strictly conform to the standard Java naming convention and all are meaningful	Most of the identifiers conform to the standard Java naming convention and are meaningful	Some of the identifiers conform to the standard Java naming convention and some are meaningful	Limited numbers of the identifiers conform to the standard Java naming convention or are barely meaningful.	All of the identifiers conform to the standard Java naming convention or not meaningful	No	Marks	
								1		
								2		
								3		
								4		
Total Marks (25 marks):								1		

	2	
	3	
	4	

CLO 3	Analyse the concepts of encapsulation, inheritance and polymorphism based on programming problems. (C4, PLO2)								
Section B: Object-Oriented Concept - Group Marks (45 Marks)									
Task	Weight	Max. Marks	Excellent	Good	Average	Poor	Very Poor	Scores (Point x Weight)	Remarks
			5	4	3	2	1		
Class Implementation	1.0	5m	Identified the proper classes, methods and attributes to solve particular problems.	Identified appropriate classes, methods and attributes to solve particular problems with minor errors.	Able to identify only some classes, methods and attributes to solve particular problems.	Inappropriate classes, methods and attributes are used.	Unable to show understanding on the usage of classes, methods and attributes.		
Object Implementation	1.0	5m	Able to create a structure of objects collaborating among themselves to carry out tasks properly.	Able to create a structure of object collaborating among themselves to carried out task properly with little minor mistakes	Structure of collaborating object created with some mistakes	Structure of collaborating objects created is barely correct.	Wrong structure of object collaboration like one object doing everything itself.		
Abstraction	1.0	5m	Define the class at the proper level of abstraction (abstract classes and methods).	Define the class at the proper level of abstraction with minor mistake	Classes defined at the proper level of abstractions with some mistakes	< 50% of correct abstraction is used	Lack of abstraction (abstract classes and methods).		

Encapsulation	2.0	10m	Completely correct implementation of encapsulation (private modifier, setter and getter methods).	Correct implementation of encapsulation with only some minor mistakes	Acceptable amount of correct implementation of encapsulation is applied in program	< 50% of correct implementation for encapsulation applied in program	Completely incorrect implementation of encapsulation (private modifier, setter and getter methods)		
Inheritance	2.0	10m	Completely correct use of inheritance (correct use of extends keyword, super & sub class)	Correct implementation of inheritance with only some minor mistakes	Acceptable amount of correct implementation of inheritance is applied in program	< 50% of correct implementation for inheritance applied in program	Completely incorrect use and implementation of inheritance		
Polymorphism	2.0	10m	Completely correct use and implementation of polymorphism. Methods toString() & equals() correctly overridden.	Correct implementation of polymorphism with only some minor mistakes	Acceptable amount of correct implementation of polymorphism is applied in program	< 50% of correct implementation for polymorphism applied in program	Completely incorrect use and implementation of polymorphism.		
Total Marks (45 marks):									

CLO 3	Analyse the concepts of encapsulation, inheritance and polymorphism based on programming problems. (C4, PLO2)								
Section C: Object-Oriented Concept - Group Marks (30 Marks)									
Task	Weight	Max. Marks	Excellent	Good	Average	Poor	Very Poor	Scores (Point x Weight)	Remarks
			5	4	3	2	1		
Cohesion	1.0	5m	The code demonstrates exceptional cohesion with all modules, classes, or functions having a clear and single responsibility.	The code demonstrates good cohesion overall where most modules, classes, or functions have a clear and single responsibility	Some modules, classes, or functions have a clear and single responsibility, but others may be slightly ambiguous	Few modules, classes, or functions have a clear and single responsibility.	Modules, classes represent more than one entity and lack of clear responsibility. Poor class cohesion.		
Coupling	1.0	5m	Minimal or no direct dependency between modules, classes, or functions. Coupling is effectively managed, resulting in highly maintainable and modular code	Most modules, classes, or functions have minimal direct dependencies.	Some modules, classes, or functions have moderate direct dependencies.	Many modules, classes, or functions have significant direct dependencies.	Modules, classes, or functions have excessive and tightly coupled dependencies which make module be harder to reuse or test.		

Association, Aggregation and Composition	2.0	10m	Associations between classes are accurately identified and properly established.	Associations between classes are generally identified and properly established.	Some associations between classes may be missing or improperly established.	Several associations between classes are missing or improperly established.	Completely incorrect use and implementation of association, aggregation and composition relationship.		
UML Class Diagram	2.0	10m	The UML class diagram demonstrates excellent understanding and implementation. All classes, attributes, and methods are accurately represented with appropriate visibility, data types, and associations.	Most classes, attributes, and methods are accurately represented with appropriate visibility, data types, and associations.	Some classes, attributes, and methods may be missing or inaccurately represented, with visibility, data types, or associations not fully defined.	Many classes, attributes, and methods are missing or inaccurately represented, with visibility, data types, or associations not adequately defined.	Classes, attributes, and methods are missing or inaccurately represented, with visibility, data types, or associations lacking clarity or definition.		
Total Marks (30 marks):									

Table of Contents

1.0 System Idea (Hospital Management System).....	17
Introduction.....	17
1.1 Manage Rooms.....	17
1.2 Manage Patients.....	17
1.3 Manage Doctors.....	17
1.4 Manage Nurses.....	17
1.5 Manage Appointments.....	17
1.6 Manage Medical Records.....	18
1.7 Search/View Data.....	18
1.8 Analytics Dashboard.....	18
1.9 Additional Features & Architecture.....	18
Task Allocation.....	19
2.0 UML Diagram.....	21
3.0 System Workflows.....	22
3.1 Main Program.....	22
3.1.1 Admin Login.....	22
3.1.2 Main Menu.....	24
3.2 Room Management.....	25
3.2.1 Add Room.....	26
3.2.1.1 Add Room (After chosen an option).....	27
3.2.2 Remove Room.....	28
3.2.2.1 Remove Room (After chosen an room to remove).....	29
3.2.3 Update Room Status.....	30
3.2.3.1 Update Room Status (After update a room status).....	31
3.2.4 Back to Main Menu.....	32
3.3 Patient Management.....	33
3.3.1 Add Patient.....	33
3.3.1.1 Add Patient (After adding a patient).....	34
3.3.2 Remove Patient.....	35
3.3.2.1 Remove Patient (After remove a patient).....	36
3.3.3 Update Patient Details.....	37
3.3.3.1 Update Patient Details (After updating a patient detail).....	38
3.3.4 View Patients.....	39
3.3.4.1 View Patients (After chosen a patient to view).....	40
3.3.3.5 Back to Main Menu.....	41
3.4 Doctor Management.....	42
3.4.1 Add Doctor.....	42
3.4.1.1 Add Doctor (After adding a doctor).....	43
3.4.2 Remove Doctor.....	44
3.4.2.1 Remove Doctor (After chosen a doctor to remove).....	44
3.4.3 Update Doctor Details.....	45

3.4.3.1 Update Doctor Details (After updating a doctor detail).....	46
3.4.4 View Doctors.....	47
3.5 Nurse Management.....	50
3.5.1 Add Nurse.....	51
3.5.1.1 Add Nurse (After adding a nurse).....	52
3.5.2 Remove Nurse.....	53
3.5.2.1 Remove Nurse (After chosen a nurse to remove).....	53
3.5.3 Update Nurse Details.....	54
3.5.3.1 Update Nurse Details (After updating a nurse detail).....	55
3.5.4 View Nurses.....	56
3.5.4.1 View Nurse (After chosen a nurse to view).....	57
3.5.5 Back to Main Menu.....	58
3.6 Appointment Management.....	59
3.6.1 Add Appointment.....	59
3.6.1.1 Add Appointment (After adding an appointment).....	60
3.6.2 Remove Appointment.....	62
3.6.2.1 Remove Appointment (After chosen an appointment to remove).....	63
3.6.3 Update Appointment Details.....	63
3.6.3.1 Update Appointment Details (After updating an appointment detail).....	64
3.6.4 View Appointments.....	64
3.6.5 Back to Main Menu.....	65
3.7 Medical Record Management.....	66
3.7.1 Add Medical Record.....	66
3.7.1.1 Add Medical Record (After adding a medical record).....	67
3.7.2 Remove Medical Record.....	67
3.7.2.1 Remove Medical Record (After chosen a medical record to remove).....	68
3.7.3 Update Medical Record Details.....	69
3.7.3.1 Update Medical Record Details (After updating a medical record detail).....	70
3.7.4 View Medical Record.....	71
3.7.4.1 View Medical Records (Chosen an appointment to view has records).....	72
3.7.4.2 View Medical Records (Chosen an appointment to view has no records).....	73
3.7.5 Back to Main Menu.....	74
3.8 Search and View Management.....	75
3.8.1 Search Patients.....	75
3.8.1.1 Search Patients (Search by name).....	76
3.8.1.2 Search Patients (Search by address).....	77
3.8.1.3 Search Patients (Search by gender).....	78
3.8.1.4 Search Patients (Search by age range).....	79
3.8.2 Search Doctors.....	80
3.8.2.1 Search Doctors (Search by Name).....	81
3.8.2.2 Search Doctors (Search by Department).....	82
3.8.2.3 Search Doctors (Search by Gender).....	83
3.8.2.4 Search Doctors (Search by Age Range).....	84
3.8.2.5 Search Doctors (Search by Experience).....	85

3.8.2.6 Search Doctors (Search by Shift).....	86
3.8.3 Search Nurses.....	87
Explanation : When the user enters "3" in the main page of the Search and View Data, it will go to the Search Nurses section. A menu of several search criteria which indicate data used for the search function for this section will be displayed. User is required to choose one search criteria.....	87
3.8.3.1 Search Nurses (Search by Name).....	87
3.8.3.2 Search Nurses (Search by Department).....	88
3.8.3.3 Search Nurses (Search by Gender).....	89
3.8.3.4 Search Nurses (Search by Age Range).....	90
3.8.3.5 Search Nurses (Search by Experience).....	91
3.8.3.6 Search Nurses (Search by Shift).....	92
3.8.4 Search Appointments.....	93
When the user enters "4" in the main page of the Search and View Data, it will go to the Search Appointment section. A menu of several search criteria which indicate data used for the search function for this section will be displayed. User is required to choose one search criteria.....	93
3.8.4.1 Search Appointments (Search by status).....	93
3.8.4.2 Search Appointments (Search by date).....	94
3.8.5 Search Rooms.....	95
When the user enters "5" in the main page of the Search and View Data, it will go to the Search Room section. A menu of several search criteria which indicate data used for the search function for this section will be displayed. User is required to choose one search criteria.....	95
3.8.5.1 Search Rooms (Search by room type).....	96
3.8.5.2 Search Rooms (Search by status).....	98
3.8.6 Back to Main Menu.....	99
3.9 Analytic Dashboards.....	100
3.10 Change Password.....	102
3.10.1 Change Password (After changing a new password).....	103
3.11 Exit.....	104
4.0 Conclusion.....	105
5.0 References.....	106

1.0 System Idea (Hospital Management System)

Introduction

The Hospital Management System (HMS) is a comprehensive, modular Java application engineered to automate and optimize all core hospital operations. Designed for efficiency, flexibility, and robustness, the HMS centralizes patient care, staff management, resource allocation, appointment scheduling, and analytics into a single, scalable platform. The system leverages real-time data, persistent storage, and advanced search and reporting to support high-throughput environments and informed decision-making at every level.

1.1 Manage Rooms

The Room Management module allows administrators to add, remove, and update the status of hospital rooms, supporting all major types: ICU, Ward, Emergency, Operation, and Isolation. Each room is tracked for type and occupancy status. The system provides real-time visibility into room availability and occupancy, with the ability to display all rooms, filter by type, and remove rooms by ID. Room utilization statistics—including occupancy rates for each room type—are calculated and visualized in the analytics dashboard, supporting dynamic resource allocation and operational planning.

1.2 Manage Patients

Patient Management is the operational backbone of the HMS. Users can register new patients, update existing records, and discharge patients. Each patient record includes name, address, phone number, gender, and age, with validation at every step. Advanced search and filtering are available by name, address, gender, and age range. PatientController supports viewing all patients, displaying details for a specific patient, and updating or removing records. Demographic statistics (age and gender distributions) are calculated and visualized, supporting both clinical and administrative planning.

1.3 Manage Doctors

The Doctor Management module enables hiring, updating, and removal of doctor profiles. Each doctor record includes name, address, phone number, gender, age, department, shift, years of experience, and specialization. The system validates all input and supports multi-criteria search by name, department, gender, age, experience, and shift. Doctors can be updated or removed by ID, and all doctors can be displayed in a formatted list. Workforce analytics provide real-time counts and distribution by department and experience, supporting optimal scheduling and resource allocation.

1.4 Manage Nurses

Nurse Management mirrors the doctor module, supporting the hiring, updating, and removal of nurse profiles. Each nurse record includes name, address, phone number, gender, age, department, shift, and years of experience. The system validates all input, supports multi-criteria search, and allows updating or removing nurses by ID. Analytics on nurse distribution by department, shift, and experience are available for efficient coverage and planning.

1.5 Manage Appointments

The Appointment Management module automates the scheduling, updating, and cancellation of appointments. An interactive workflow guides users through selecting patient, doctor, room, date, and time, with validation and conflict detection at each step. Appointments can be viewed, searched, updated (status: Scheduled/Active), or cancelled by ID. The system supports bulk viewing by status or date range (today, week, month). Appointment trends—including weekly distribution, peak days, and most common times—are calculated and visualized in the analytics dashboard. Each patient's appointment history can also be displayed.

1.6 Manage Medical Records

Medical Record Management ensures secure creation, updating, and removal of patient-linked records. Each record can store diagnoses, prescriptions, and treatments, with audit trails for all changes. Users can add, update, or remove records, and view the full medical history for any patient. The system enforces data completeness and supports longitudinal patient histories for evidence-based care. Medical records are linked to patient IDs and can be searched and displayed as needed.

1.7 Search/View Data

A unified search interface enables rapid querying and cross-referencing of patients, doctors, nurses, appointments, and rooms using multiple criteria. Each entity supports advanced search:

- Patients: by name, age range, gender, address
- Doctors/Nurses: by name, department, gender, age, experience, shift
- Appointments: status, date
- Rooms: by type, status

This module ensures instant access to operational data for decision support and high-throughput environments.

1.8 Analytics Dashboard

The analytics dashboard aggregates and visualizes live statistics, including:

- Total patients, active appointments, available rooms, staff on duty (doctors and nurses)
- Room utilization rates by type (ICU, Ward, Emergency, Operation, Isolation)
- Patient demographics (age and gender distributions)
- Appointment analytics (day-of-week trends, peak hours, most common appointment times)

Visualizations include demographic bars and appointment trend graphs. Peak analysis identifies the busiest days and times, supporting proactive resource management and strategic planning.

1.9 Additional Features & Architecture

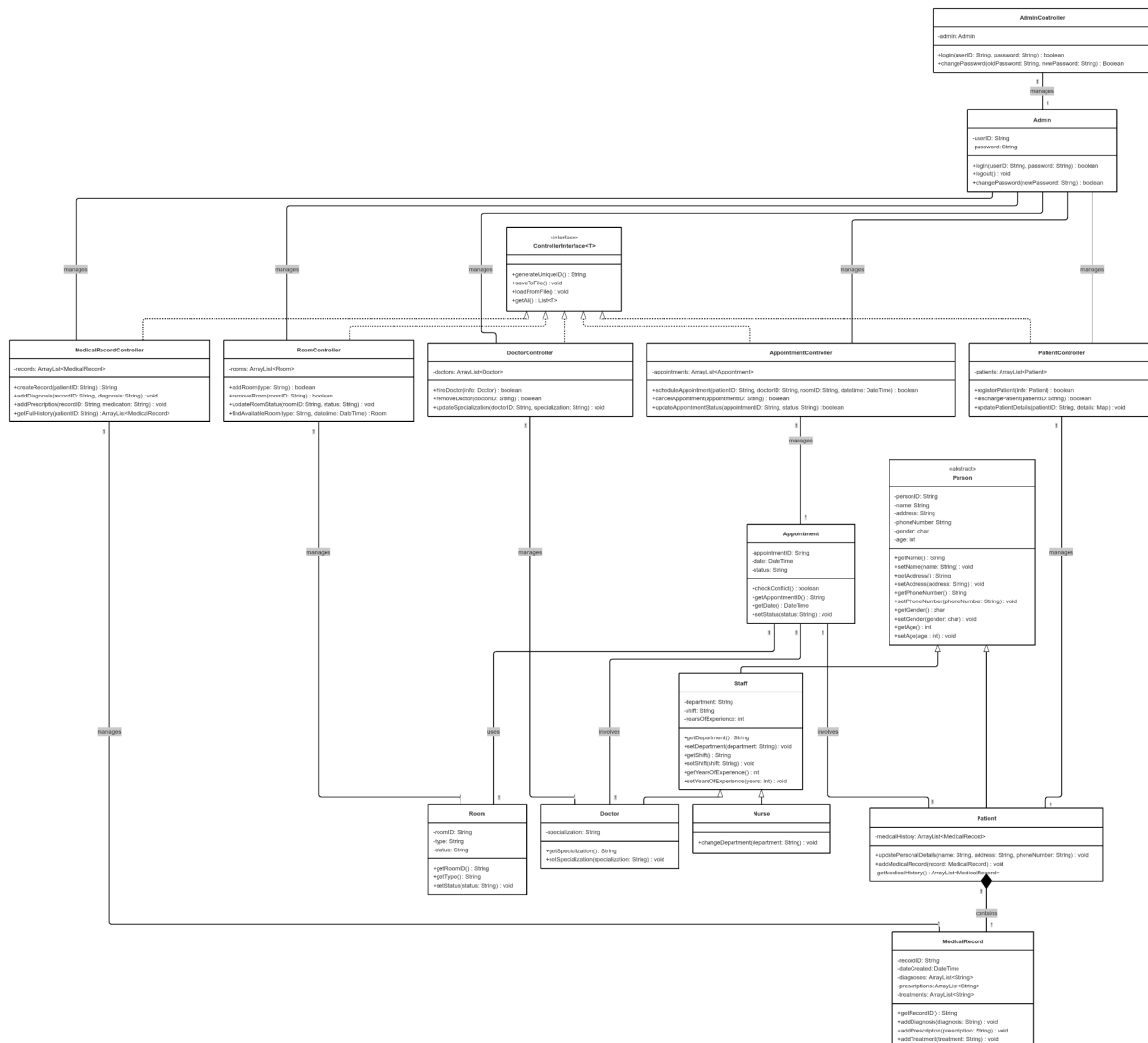
- **Authentication:** Secure admin login and hidden password input entry for input hiding purposes.
- **Persistence:** All data is saved and loaded from CSV files for repeated access and modifications.
- **Validation:** Comprehensive input validation and error handling throughout.
- **Utilities:** Helper classes for string formatting, color codes, date/time utilities, and menu constants.
- **Extensibility:** Modular design allows for rapid adaptation to new requirements and easy integration of additional features.

Task Allocation

Student Name	Modules Handled	Description
Tan Wy Hang	<ol style="list-style-type: none"> 1. Room model: definition of room attributes, room status, and room type; management of room data. 2. Person abstract class: base class for all person-related entities (patient, doctor, nurse, admin), encapsulating shared attributes and behaviors. 3. Controller interface: standardises CRUD method signatures for all controllers. 4. RoomController implementations: concrete classes for managing room and including all CRUD operations related. 5. Patient model: definition of patient attributes and integration with appointments and medical records. 6. PatientController: manages patient registration, data updates, removal, and listing; links patients to appointments and medical records. 7. Search/view feature: unified search and filtering for patients, doctors, nurses, rooms, and appointments; supports multi-criteria queries with the use of array streams and formatted data display. 8. Analytics dashboard: data aggregation and visualization of operational statistics such as room occupancy, patient demographics, peak operating periods and appointment trends. 	<p>Handled the room model, person abstract class, controller interface, and respective controller classes. Developed the search/view feature and the analytics dashboard. Responsibilities included implementing CRUD operations for rooms (e.g., adding a new room, updating room status, deleting a room, and viewing all rooms), designing the abstract person class as a base for patient, doctor, nurse, and admin models, and enforcing a consistent controller structure for CRUD across modules. The search/view feature allows searching for patients by name or filtering rooms by type, while the analytics dashboard displays statistics such as room occupancy rates and patient demographics. Implements ENUM as argumentative inputs for readability, scalability and error prevention.</p>

Tan Ying Nan	<ol style="list-style-type: none"> 1. Appointment model: structure for appointment data, including patient, doctor, room, date, time, and status. 2. Medical record model: structure for storing diagnoses, treatments, and prescriptions linked to patients. 3. AppointmentController: manages scheduling, updating, canceling, and viewing appointments. 4. MedicalRecordController: handles creation, updating, deletion, and retrieval of medical records. 5. StringUtils model: Defines the utility functions for repetitive string operations like the string beautifier 6. DateTimeUtils model: to simplify handling of date by retrieving valid dates automatically, formatting date into a consistent format, and combines date and time into a datetime object. 	<p>Worked on the appointment model, medical record, patient model, and their respective controller classes. Implemented CRUD operations for appointments (e.g., scheduling a new appointment, updating appointment status, canceling an appointment, and listing all appointments), medical records (e.g., adding a new record, editing diagnosis or treatment, deleting a record, and viewing a patient's medical history), and patients (e.g., registering a patient, editing patient data, removing a patient, and displaying all patients). Ensured seamless integration between patient data, appointments, and medical records for comprehensive patient management.</p>
Chia Zhen Yang	<ol style="list-style-type: none"> 1. Doctor model: definition of doctor attributes, including department, specialization, shift, and experience. 2. Nurse model: structure for nurse data, including department, shift, and experience. 3. Admin model: structure for admin user data and authentication. 4. DoctorController: manages adding, updating, deleting, and viewing doctor profiles. 5. NurseController: handles CRUD operations for nurse records. 6. AdminController: manages admin account creation, updates, deletion, and listing; supports authentication and role management for system access. 	<p>Responsible for the doctor, admin, and nurse models, each with their respective controller classes. Implemented CRUD operations for doctors (e.g., adding a doctor, updating doctor profile, deleting a doctor, and listing all doctors), nurses (e.g., registering a nurse, editing nurse details, removing a nurse, and viewing nurse records), and admins (e.g., creating admin accounts, updating admin information, deleting admin profiles, and displaying all admins). Ensured that all staff-related data can be managed efficiently and securely within the system.</p>

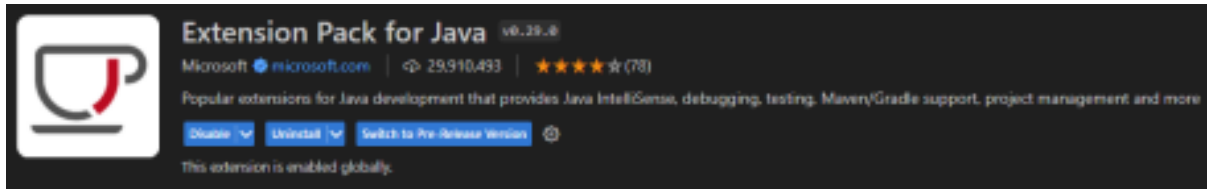
Page 21 of 106



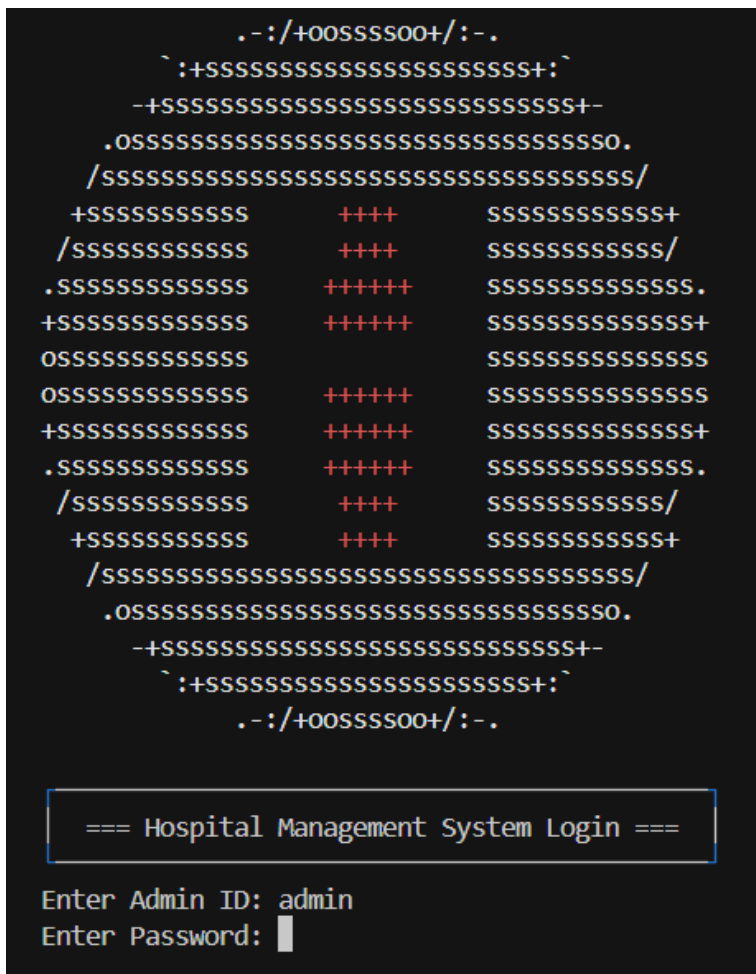
3.0 System Workflows

3.1 Main Program

Note : Please use **Visual Studio Code (terminal)** to run our system for the best result. Thank you.



3.1.1 Admin Login



Explanation : In this page, admin is required to enter the Admin ID and Password to login into the system. When entering the Admin ID and Password, Admin ID will display as usual but Password will not be shown as the image shown above.

Note : The image taken when Admin ID and Password are entered.
The default Admin ID is **admin** and the default Password is **admin**.

```

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      `:+SSSSSSSSSSSSSSSSSSSSSS+:`
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      0SSSSSSSSSSSS      ++++++      SSSSSSSSSSSSS
      0SSSSSSSSSSSS      ++++++      SSSSSSSSSSSSS
      +SSSSSSSSSSSS      ++++++      SSSSSSSSSSSS+
      .SSSSSSSSSSSS      ++++++      SSSSSSSSSSSS.
      /SSSSSSSSSS      +++++      SSSSSSSSSS/
      +SSSSSSSSSS      +++++      SSSSSSSSSS+
      /SSSSSSSSSSSSSSSSSSSSSSSSS/
      .0SSSSSSSSSSSSSSSSSSSSSSSS0.
      -+SSSSSSSSSSSSSSSSSSSSSSSS+-
      `:+SSSSSSSSSSSSSSSSSSSSSS+:`
      .-:/+00SSSS00+/:-.

=== Hospital Management System Login ===

Enter Admin ID: admin
Enter Password:

CREDENTIALS DO NOT MATCH!


```

Explanation : If the Admin ID or Password doesn't match the preset Admin ID and Password, a message "CREDENTIALS DO NOT MATCH" will be displayed. After pressing Enter again, the system will require admin to enter the credentials again until the correct credentials are matched.

3.1.2 Main Menu

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      .-:/+00SSSS00+/:-.
      `:+SSSSSSSSSSSSSSSSSSSS+:`
      -+SSSSSSSSSSSSSSSSSSSSSSSS+-
      .0SSSSSSSSSSSSSSSSSSSSSSSS0.
      /SSSSSSSSSSSSSSSSSSSSSSSSS/
      +SSSSSSSSSS      +SSSSSSSSSS+
      /SSSSSSSSSS      +SSSSSSSSSS/
      .SSSSSSSSSSSSSS  +SSSSSSSSSSS.
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      `:+SSSSSSSSSSSSSSSSSSSS+:`
      .-:/+00SSSS00+/:-.

```

Main Menu	
Option	Description
1	Manage Rooms
2	Manage Patients
3	Manage Doctors
4	Manage Nurses
5	Manage Appointments
6	Manage Medical Records
7	Search/View Data
8	Analytics Dashboard
9	Change Password
0	Exit

Choose an option: █

Explanation : After entering the correct credentials, the system will direct the admin to the **Main Menu**. In this menu, all available options will be clearly displayed, each accompanied by a concise description. The admin is required to select a valid option (ranging from "0" to "9") to proceed with the desired function of the system.

Note : The "lock" in the logo will change its colour from red to green after the correct credentials have been entered.

3.2 Room Management

=== All Rooms ===

R72[Available] Type: ICU	R54[Available] Type: ICU	R47[Available] Type: ICU
R77[Occupied] Type: ICU	R45[Available] Type: ICU	R13[Available] Type: ICU
R57[Available] Type: ICU	R81[Available] Type: ICU	R75[Occupied] Type: Isolation
R26[Available] Type: Emergency	R40[Occupied] Type: Ward	R94[Available] Type: Emergency
R92[Available] Type: Emergency	R63[Occupied] Type: Ward	R20[Occupied] Type: Operation
R78[Available] Type: Ward	R12[Available] Type: Emergency	R91[Available] Type: Operation

Manage Rooms	
Option	Description
1	Add Room
2	Remove Room
3	Update Room Status
0	Back to Main Menu

Choose an option (or enter 0 to go back):

Explanation : After entering "1" in the **Main Menu**, the system will lead the admin to the **Room Management** section. In the main page of the **Room Management**, all the rooms will be displayed along with the room status and room type. A menu will also be displayed which shows all the available functions for the room management.

3.2.1 Add Room

=== All Rooms ===

R72[Available] Type: ICU	R54[Available] Type: ICU	R47[Available] Type: ICU
R77[Occupied] Type: ICU	R45[Available] Type: ICU	R13[Available] Type: ICU
R57[Available] Type: ICU	R81[Available] Type: ICU	R75[Occupied] Type: Isolation
R26[Available] Type: Emergency	R40[Occupied] Type: Ward	R94[Available] Type: Emergency
R92[Available] Type: Emergency	R63[Occupied] Type: Ward	R20[Occupied] Type: Operation
R78[Available] Type: Ward	R12[Available] Type: Emergency	R91[Available] Type: Operation

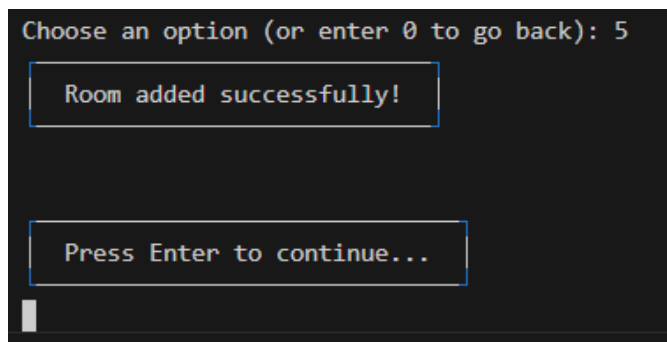
Room Type

Option	Description
1	ICU
2	Ward
3	Emergency
4	Operation
5	Isolation
0	Back to "Manage Rooms"

Choose an option (or enter 0 to go back):

Explanation : After entering "1" on the main page of the **Room Management** section, the admin will be directed to the **Add Room** interface. The section displaying all existing rooms will remain visible, just as it appears on the main page. A menu listing all available room types for the new room will also be displayed, allowing the admin to select the appropriate type during the room creation process.

3.2.1.1 Add Room (After chosen an option)



Note : Image taken when chosen option 5 (Isolation).



Explanation : After the type of room wanted, “Room added successfully!” will be displayed and ask the user to press Enter to continue (back to the main page of the **Room Management**). Then there will be an Isolation room added (R22) as the image shown above.

3.2.2 Remove Room

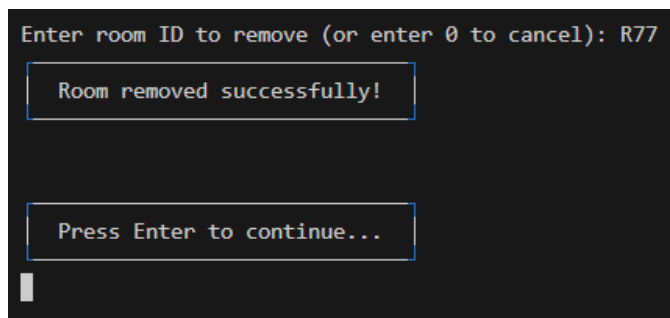
=== All Rooms ===

R72[Available] Type: ICU	R54[Available] Type: ICU	R47[Available] Type: ICU
R77[Occupied] Type: ICU	R45[Available] Type: ICU	R13[Available] Type: ICU
R57[Available] Type: ICU	R81[Available] Type: ICU	R75[Occupied] Type: Isolation
R26[Available] Type: Emergency	R40[Occupied] Type: Ward	R94[Available] Type: Emergency
R92[Available] Type: Emergency	R63[Occupied] Type: Ward	R20[Occupied] Type: Operation
R78[Available] Type: Ward	R12[Available] Type: Emergency	R91[Available] Type: Operation
R22[Available] Type: Isolation		

Enter room ID to remove (or enter 0 to cancel):

Explanation : After entering "2" on the main page of the **Room Management** section, the admin will be directed to the **Remove Room** interface. The section displaying all existing rooms will remain visible, just as it appears on the main page. Admin is required to enter the room ID that he/she wants to remove.

3.2.2.1 Remove Room (After chosen an room to remove)



Note : Image taken when chosen room R77 to remove.



Explanation : After entering the room ID, "Room removed successfully!" will be displayed and ask the user to press Enter to continue (back to the main page of the **Room Management**). Then the room with the room ID entered (R77) will be removed as in the image shown above.

3.2.3 Update Room Status

```

=== All Rooms ===

+-----+ +-----+ +-----+
| R72[Available] | | R54[Available] | | R47[Available] |
| Type: ICU      | | Type: ICU      | | Type: ICU      |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R45[Available] | | R13[Available] | | R57[Available] |
| Type: ICU      | | Type: ICU      | | Type: ICU      |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R81[Available] | | R75[ Occupied] | | R26[Available] |
| Type: ICU      | | Type: Isolation | | Type: Emergency |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R40[ Occupied] | | R94[Available] | | R92[Available] |
| Type: Ward     | | Type: Emergency | | Type: Emergency |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R63[ Occupied] | | R20[ Occupied] | | R78[Available] |
| Type: Ward     | | Type: Operation | | Type: Ward     |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R12[Available] | | R91[Available] | | R22[Available] |
| Type: Emergency | | Type: Operation | | Type: Isolation |
+-----+ +-----+ +-----+

Enter room ID (or enter 0 to cancel): █

```

Explanation : After entering "3" in the main page of **Room Management**, the user will be directed to the **Update Room Status** section. User is asked to enter the room ID for the room needed to update.

3.2.3.1 Update Room Status (After update a room status)

```

Enter room ID (or enter 0 to cancel): R22
Assign new status:
[1] Available
[2] Occupied
Choose an option (or enter 0 to cancel): 2

Room status updated successfully!

Press Enter to continue...

```

Note : Image taken when chosen option 2 (Occupied) to update the room.

```

=== All Rooms ===

+-----+ +-----+ +-----+
| R72[Available] | | R54[Available] | | R47[Available] |
| Type: ICU      | | Type: ICU      | | Type: ICU      |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R45[Available] | | R13[Available] | | R57[Available] |
| Type: ICU      | | Type: ICU      | | Type: ICU      |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R81[Available] | | R75[ Occupied] | | R26[Available] |
| Type: ICU      | | Type: Isolation | | Type: Emergency |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R40[ Occupied] | | R94[Available] | | R92[Available] |
| Type: Ward     | | Type: Emergency | | Type: Emergency |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R63[ Occupied] | | R20[ Occupied] | | R78[Available] |
| Type: Ward     | | Type: Operation | | Type: Ward     |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R12[Available] | | R91[Available] | | R22[ Occupied] |
| Type: Emergency | | Type: Operation | | Type: Isolation |
+-----+ +-----+ +-----+

Manage Rooms
+-----+
| Option | Description |
+-----+
| 1       | Add Room    |
+-----+
| 2       | Remove Room |
+-----+
| 3       | Update Room Status |
+-----+
| 0       | Back to Main Menu |
+-----+

Choose an option (or enter 0 to go back): 

```

Explanation : After entering the room ID, the user is required to assign a new status for the specified room by entering the option. A message, "Room status updated successfully!" will be displayed after all the details have been entered and ask the user to press Enter to continue (back to the main page of the **Room Management**). Once confirmed, the status of the specific room (R22) will be changed as in the image shown above.

3.2.4 Back to Main Menu

Option	Description
1	Add Room
2	Remove Room
3	Update Room Status
0	Back to Main Menu

Choose an option (or enter 0 to go back): █

Note : Full page image can refer back the image in 3.2

Option	Description
1	Manage Rooms
2	Manage Patients
3	Manage Doctors
4	Manage Nurses
5	Manage Appointments
6	Manage Medical Records
7	Search/View Data
8	Analytics Dashboard
9	Change Password
0	Exit

Choose an option: █

Note : Full page image can refer back the image in 3.1.2

Explanation : When entering "0" in the main page of the **Room Management**, the user will go back to the **Main Menu**, where the user can continue with other sections of the system as in the image shown above.

3.3 Patient Management

Option	Description
1	Add Patient
2	Remove Patient
3	Update Patient Details
4	View Patients
0	Back to Main Menu

Choose an option (or enter 0 to go back):

Explanation : After entering "2" in the **Main Menu**, the user will enter into the **Patient Management** section. A menu with all available functions of the section will be displayed and ask the user to enter an option.

3.3.1 Add Patient

Example Input Format for Adding a Patient	
Field	Example Value
Name	John Doe
Age	30
Gender	M (Male) or F (Female)
Address	123-Main-St-City
Phone Number	1234567890

Enter patient name (or type '0' to abort):

Explanation : When the user enters "1" in the main page of the **Patient Management**, it will lead the user to the **Add Patient** section. A sample input will be displayed for better understanding and the system will ask the user to enter the details needed to add a new patient as the details show in the sample input.

3.3.1.1 Add Patient (After adding a patient)

Example Input Format for Adding a Patient	
Field	Example Value
Name	John Doe
Age	30
Gender	M (Male) or F (Female)
Address	123-Main-St-City
Phone Number	1234567890

Enter patient name (or type '0' to abort): Bombardino Crocodilo
Enter patient age (or type 'cancel' to abort): 20
Enter patient gender (M/F) (or type '0' to abort): M
Enter patient address (or type '0' to abort): 911-Manhattan-NewYorkCity
Enter patient phone number (or type '0' to abort): 9110604513

Patient added successfully!

Press Enter to continue...

Explanation : After all details needed for adding a new patient have been entered, "Patient added successfully" will be displayed and ask the user to press Enter to continue (back to the main page of the **Patient Management**).

3.3.2 Remove Patient

```

=== All Patients ===

+-----+ +-----+ +-----+
| P0001 - John Smith | | P0002 - Emily Johnson | | P0003 - Michael Brown |
| Age: 45 | Gender: M | | Age: 32 | Gender: F | | Age: 67 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0004 - Sarah Wilson | | P0005 - David Moore | | P0006 - Jessica Taylor |
| Age: 28 | Gender: F | | Age: 53 | Gender: M | | Age: 41 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0007 - William Anderson | | P0008 - Jennifer Thomas | | P0009 - Robert Jackson |
| Age: 72 | Gender: M | | Age: 38 | Gender: F | | Age: 59 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0010 - Lisa White | | P0011 - James Harris | | P0012 - Patricia Martin |
| Age: 25 | Gender: F | | Age: 49 | Gender: M | | Age: 63 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0013 - Thomas Thompson | | P0014 - Mary Garcia | | P0015 - Charles Martinez |
| Age: 36 | Gender: M | | Age: 51 | Gender: F | | Age: 44 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0016 - Elizabeth Robinson | | P0017 - Daniel Clark | | P0018 - Susan Rodriguez |
| Age: 77 | Gender: F | | Age: 33 | Gender: M | | Age: 58 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0019 - Matthew Lewis | | P0020 - Nancy Lee | | P9088 - GAY |
| Age: 42 | Gender: M | | Age: 69 | Gender: F | | Age: 19 | Gender: M |
+-----+ +-----+ +-----+

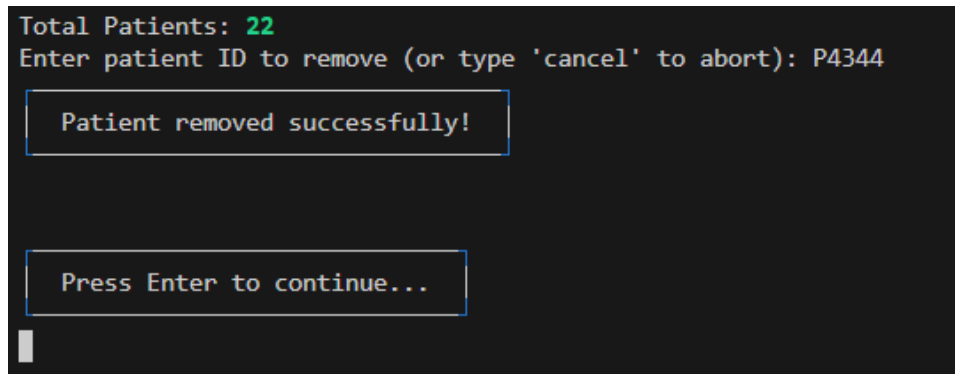
+-----+ +-----+ +-----+
| P4344 - Bombardino Crocodilo | | | |
| Age: 20 | Gender: M | | | |
+-----+ +-----+ +-----+

Total Patients: 22
Enter patient ID to remove (or type 'cancel' to abort): █

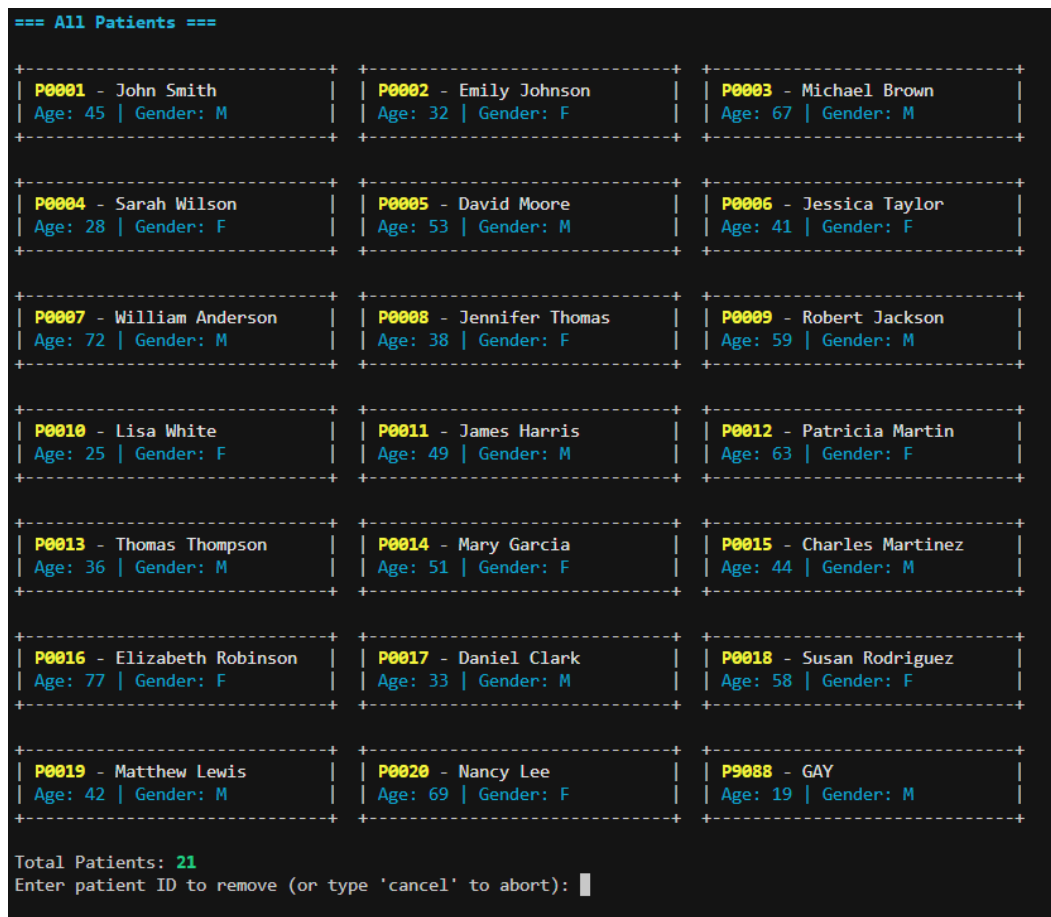
```

Explanation : When the user enters "2", it will go to the **Remove Patient** section. All the patients will be displayed along with their ages and genders in the grid format. The number of total patients will also be shown. The user is required to enter the patient ID needed to remove.

3.3.2.1 Remove Patient (After remove a patient)



Note : Full page image can refer back the image in 3.3.2



Explanation : After entering the patient ID, "Patient removed successfully!" will be displayed and ask the user to press Enter to continue (back to the main page of the **Patient Management**).Then the patient with the patient ID entered (P4344) will be removed as in the image shown above.

3.3.3 Update Patient Details

```

=== All Patients ===

```

P0001 - John Smith Age: 45 Gender: M	P0002 - Emily Johnson Age: 32 Gender: F	P0003 - Michael Brown Age: 67 Gender: M
P0004 - Sarah Wilson Age: 28 Gender: F	P0005 - David Moore Age: 53 Gender: M	P0006 - Jessica Taylor Age: 41 Gender: F
P0007 - William Anderson Age: 72 Gender: M	P0008 - Jennifer Thomas Age: 38 Gender: F	P0009 - Robert Jackson Age: 59 Gender: M
P0010 - Lisa White Age: 25 Gender: F	P0011 - James Harris Age: 49 Gender: M	P0012 - Patricia Martin Age: 63 Gender: F
P0013 - Thomas Thompson Age: 36 Gender: M	P0014 - Mary Garcia Age: 51 Gender: F	P0015 - Charles Martinez Age: 44 Gender: M
P0016 - Elizabeth Robinson Age: 77 Gender: F	P0017 - Daniel Clark Age: 33 Gender: M	P0018 - Susan Rodriguez Age: 58 Gender: F
P0019 - Matthew Lewis Age: 42 Gender: M	P0020 - Nancy Lee Age: 69 Gender: F	P9088 - GAY Age: 19 Gender: M

Total Patients: 21
Enter patient ID to update (or type 'cancel' to abort): P9088

Explanation : When the user enters "3", it will go to the **Update Patient Details** section. All the patients will be displayed along with their ages and genders in the grid format. The number of total patients will also be shown. The user is required to enter the patient ID needed to update.

3.3.3.1 Update Patient Details (After updating a patient detail)

```

Total Patients: 21
Enter patient ID to update (or type 'cancel' to abort): P9088
Enter new name (or type 'cancel' to abort): Tung Tung Sahur
Enter new age (or type 'cancel' to abort): 20
Enter new gender (M/F) (or type 'cancel' to abort): M
Enter new address (or type 'cancel' to abort): 999-CaliforniaChongQing
Enter new phone number (or type 'cancel' to abort): 9995557347

```

Patient details updated successfully!

Press Enter to continue...

Note : Full page image can refer back to the image in 3.3.3

```

=== All Patients ===
+-----+ +-----+ +-----+
| P0001 - John Smith | | P0002 - Emily Johnson | | P0003 - Michael Brown |
| Age: 45 | Gender: M | | Age: 32 | Gender: F | | Age: 67 | Gender: M |
+-----+ +-----+ +-----+
+-----+ +-----+ +-----+
| P0004 - Sarah Wilson | | P0005 - David Moore | | P0006 - Jessica Taylor |
| Age: 28 | Gender: F | | Age: 53 | Gender: M | | Age: 41 | Gender: F |
+-----+ +-----+ +-----+
+-----+ +-----+ +-----+
| P0007 - William Anderson | | P0008 - Jennifer Thomas | | P0009 - Robert Jackson |
| Age: 72 | Gender: M | | Age: 38 | Gender: F | | Age: 59 | Gender: M |
+-----+ +-----+ +-----+
+-----+ +-----+ +-----+
| P0010 - Lisa White | | P0011 - James Harris | | P0012 - Patricia Martin |
| Age: 25 | Gender: F | | Age: 49 | Gender: M | | Age: 63 | Gender: F |
+-----+ +-----+ +-----+
+-----+ +-----+ +-----+
| P0013 - Thomas Thompson | | P0014 - Mary Garcia | | P0015 - Charles Martinez |
| Age: 36 | Gender: M | | Age: 51 | Gender: F | | Age: 44 | Gender: M |
+-----+ +-----+ +-----+
+-----+ +-----+ +-----+
| P0016 - Elizabeth Robinson | | P0017 - Daniel Clark | | P0018 - Susan Rodriguez |
| Age: 77 | Gender: F | | Age: 33 | Gender: M | | Age: 58 | Gender: F |
+-----+ +-----+ +-----+
+-----+ +-----+ +-----+
| P0019 - Matthew Lewis | | P0020 - Nancy Lee | | P9088 - Tung Tung Sahur |
| Age: 42 | Gender: M | | Age: 69 | Gender: F | | Age: 20 | Gender: M |
+-----+ +-----+ +-----+

Total Patients: 21
Enter patient ID to update (or type 'cancel' to abort):

```

Explanation : After entering the patient ID, the user is required to update new details for that patient. A message, "Patient removed successfully!" will be displayed after all details have been entered and ask the user to press Enter to continue (back to the main page of the **Patient Management**). Then the patient with the patient ID entered (P9088) will be updated as in the image shown above.

3.3.4 View Patients

```

=== All Patients ===

```

P0001 - John Smith Age: 45 Gender: M	P0002 - Emily Johnson Age: 32 Gender: F	P0003 - Michael Brown Age: 67 Gender: M
P0004 - Sarah Wilson Age: 28 Gender: F	P0005 - David Moore Age: 53 Gender: M	P0006 - Jessica Taylor Age: 41 Gender: F
P0007 - William Anderson Age: 72 Gender: M	P0008 - Jennifer Thomas Age: 38 Gender: F	P0009 - Robert Jackson Age: 59 Gender: M
P0010 - Lisa White Age: 25 Gender: F	P0011 - James Harris Age: 49 Gender: M	P0012 - Patricia Martin Age: 63 Gender: F
P0013 - Thomas Thompson Age: 36 Gender: M	P0014 - Mary Garcia Age: 51 Gender: F	P0015 - Charles Martinez Age: 44 Gender: M
P0016 - Elizabeth Robinson Age: 77 Gender: F	P0017 - Daniel Clark Age: 33 Gender: M	P0018 - Susan Rodriguez Age: 58 Gender: F
P0019 - Matthew Lewis Age: 42 Gender: M	P0020 - Nancy Lee Age: 69 Gender: F	P9088 - Tung Tung Sahur Age: 20 Gender: M

Total Patients: 21
Enter patient ID to view details (or type 'cancel' to abort):

Explanation : When the user enters "4", it will go to the **View Patient** section. All the patients will be displayed, then the user is required to enter the patient ID that wanted to view.

3.3.4.1 View Patients (After chosen a patient to view)

```

=== All Patients ===

+-----+ +-----+ +-----+
| P0001 - John Smith | | P0002 - Emily Johnson | | P0003 - Michael Brown |
| Age: 45 | Gender: M | | Age: 32 | Gender: F | | Age: 67 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0004 - Sarah Wilson | | P0005 - David Moore | | P0006 - Jessica Taylor |
| Age: 28 | Gender: F | | Age: 53 | Gender: M | | Age: 41 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0007 - William Anderson | | P0008 - Jennifer Thomas | | P0009 - Robert Jackson |
| Age: 72 | Gender: M | | Age: 38 | Gender: F | | Age: 59 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0010 - Lisa White | | P0011 - James Harris | | P0012 - Patricia Martin |
| Age: 25 | Gender: F | | Age: 49 | Gender: M | | Age: 63 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0013 - Thomas Thompson | | P0014 - Mary Garcia | | P0015 - Charles Martinez |
| Age: 36 | Gender: M | | Age: 51 | Gender: F | | Age: 44 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0016 - Elizabeth Robinson | | P0017 - Daniel Clark | | P0018 - Susan Rodriguez |
| Age: 77 | Gender: F | | Age: 33 | Gender: M | | Age: 58 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0019 - Matthew Lewis | | P0020 - Nancy Lee | | P0088 - Tung Tung Sahur |
| Age: 42 | Gender: M | | Age: 69 | Gender: F | | Age: 20 | Gender: M |
+-----+ +-----+ +-----+

Total Patients: 21
Enter patient ID to view details (or type 'cancel' to abort): P0088

=== Patient Details ===

Patient Details:
Person ID      : P0088
Name           : Tung Tung Sahur
Address        : 999-CaliforniaChongQing
Phone Number   : 9995557347
Gender         : M
Age            : 20

Press Enter to continue...

```

Explanation : After entering the patient ID, a box of detailed information for the patient with that patient ID will be displayed. Then the user is asked to press Enter to continue (back to the main page of the **Patient Management**).

3.3.3.5 Back to Main Menu

Option	Description
1	Add Patient
2	Remove Patient
3	Update Patient Details
4	View Patients
0	Back to Main Menu

Choose an option (or enter 0 to go back):

Note : Full page image can refer back to the image in 3.3

Option	Description
1	Manage Rooms
2	Manage Patients
3	Manage Doctors
4	Manage Nurses
5	Manage Appointments
6	Manage Medical Records
7	Search/View Data
8	Analytics Dashboard
9	Change Password
0	Exit

Choose an option:

Note : Full page image can refer back the image in 3.1.2

Explanation : When entering "0" in the main page of the **Patient Management**, the user will go back to the **Main Menu**, where the user can continue with other sections of the system as in the image shown above.

3.4 Doctor Management

Manage Doctors	
Option	Description
1	Add Doctor
2	Remove Doctor
3	Update Doctor Details
4	View Doctors
0	Back to Main Menu

Choose an option:

Explanation : After entering "3" in the **Main Menu**, the user will go to the **Doctor Management** section. A menu of all available functions for the section will be displayed. User is required to choose an option to perform a specific function of the **Doctor Management**.

3.4.1 Add Doctor

Example Input Format for Adding a Doctor	
Field	Example Value
Name	Dr. John Doe
Age	35
Gender	M (Male) or F (Female)
Address	123 Main St, City
Phone Number	1234567890
Department	Cardiology
Shift	Morning
Years of Experience	10
Specialization	Surgeon

Enter doctor name (e.g., John Doe) or type 'cancel' to abort:

Explanation : When the user enters "1" in the main page of the **Doctor Management**, it will lead the user to the **Add Doctor** section. A sample input will be displayed for better understanding and the

system will ask the user to enter the details needed to add a new doctor, the same as the details shown in the sample input.

3.4.1.1 Add Doctor (After adding a doctor)

```
Enter doctor name (e.g., John Doe) or type 'cancel' to abort: Kong Kong
Enter doctor age (e.g., 35) or type 'cancel' to abort: 40
Enter doctor gender (M/F) or type 'cancel' to abort: M
Enter doctor address (e.g., 123 Main St, City) or type 'cancel' to abort: 777 Queenstown St, Singapore
Enter doctor phone number (e.g., 1234567890) or type 'cancel' to abort: 1100299557
Enter doctor department (e.g., Cardiology) or type 'cancel' to abort: Cardiology
Enter doctor shift (e.g., Morning, Evening) or type 'cancel' to abort: Evening
Enter doctor years of experience (e.g., 10) or type 'cancel' to abort: 15
Enter doctor specialization (e.g., Surgeon) or type 'cancel' to abort: Surgeon
Doctor added successfully!
```

Press Enter to continue...

Note : Full page image can refer back to the image in 3.4.1

```
=== All Doctors ===
D4467 - Zhang Wei
D4468 - Sarah Johnson
D4469 - Michael Chen
D4470 - Emma Williams
D4471 - Raj Patel
D4472 - Maria Garcia
D4473 - James Wilson
D4474 - Liu Yang
D4475 - Ahmed Hassan
D4476 - Sofia Martinez
D4477 - David Kim
D8891 - Kong Kong
```

Explanation : After all details needed for adding a new doctor have been entered, "Doctor added successfully" will be displayed and ask the user to press **Enter** to continue (back to the main page of the **Doctor Management**). A doctor (D8891 - Kong Kong) will be added as in the image shown above.

3.4.2 Remove Doctor

```
=== All Doctors ===  
  
D4467 - Zhang Wei  
D4468 - Sarah Johnson  
D4469 - Michael Chen  
D4470 - Emma Williams  
D4471 - Raj Patel  
D4472 - Maria Garcia  
D4473 - James Wilson  
D4474 - Liu Yang  
D4475 - Ahmed Hassan  
D4476 - Sofia Martinez  
D4477 - David Kim  
D8891 - Kong Kong  
Enter doctor ID to remove (or type '0' to abort):
```

Explanation : When the user enters "2" in the main page of the **Doctor Management**, it will go to the **Remove Doctor** section. All the doctors will be displayed in a list. User is required to enter the doctor ID for the doctor to be removed.

3.4.2.1 Remove Doctor (After chosen a doctor to remove)

```
=== All Doctors ===  
  
D4467 - Zhang Wei  
D4468 - Sarah Johnson  
D4469 - Michael Chen  
D4470 - Emma Williams  
D4471 - Raj Patel  
D4472 - Maria Garcia  
D4473 - James Wilson  
D4474 - Liu Yang  
D4475 - Ahmed Hassan  
D4476 - Sofia Martinez  
D4477 - David Kim  
D8891 - Kong Kong  
Enter doctor ID to remove (or type '0' to abort): D8891  
Doctor removed successfully!
```

Press Enter to continue...

Explanation : After entering the doctor ID, "Doctor removed successfully!" will be displayed and ask the user to press **Enter** to continue (back to the main page of the **Doctor Management**). Then the doctor with the doctor ID entered (D8891 - Kong Kong) will be removed as in the image shown above.

3.4.3 Update Doctor Details

=== All Doctors ===

D4467 - Zhang Wei
D4468 - Sarah Johnson
D4469 - Michael Chen
D4470 - Emma Williams
D4471 - Raj Patel
D4472 - Maria Garcia
D4473 - James Wilson
D4474 - Liu Yang
D4475 - Ahmed Hassan
D4476 - Sofia Martinez
D4477 - David Kim

Example Input Format for Adding a Doctor	
Field	Example Value
Name	Dr. John Doe
Age	35
Gender	M (Male) or F (Female)
Address	123 Main St, City
Phone Number	1234567890
Department	Cardiology
Shift	Morning
Years of Experience	10
Specialization	Surgeon

Enter doctor ID to update (or type '0' to abort):

Explanation : When the user enters "3" in the main page of the **Doctor Management**, it will lead the user to the **Update Doctor Details** section. All the doctors will be displayed in a list and a sample input required for updating doctor details will be displayed for better understanding. Then, the system will ask the user to enter the details needed to add a new doctor, the same as the details shown in the sample input.

3.4.3.1 Update Doctor Details (After updating a doctor detail)

```
=== All Doctors ===
```

```
D4467 - Zhang Wei
D4468 - Sarah Johnson
D4469 - Michael Chen
D4470 - Emma Williams
D4471 - Raj Patel
D4472 - Maria Garcia
D4473 - James Wilson
D4474 - Liu Yang
D4475 - Ahmed Hassan
D4476 - Sofia Martinez
D4477 - David Kim
```

Example Input Format for Adding a Doctor	
Field	Example Value
Name	Dr. John Doe
Age	35
Gender	M (Male) or F (Female)
Address	123 Main St, City
Phone Number	1234567890
Department	Cardiology
Shift	Morning
Years of Experience	10
Specialization	Surgeon

```
Enter doctor ID to update (or type '0' to abort): D4474
Enter new specialization (leave blank to skip, or type '0' to abort): Surgeon
```

```
Doctor specialization updated successfully!
```

```
Enter new department (leave blank to skip, or type '0' to abort): Urology
```

```
Doctor department updated successfully!
```

```
Enter new shift (leave blank to skip, or type '0' to abort):
```

```
Shift update skipped.
```

```
Enter new years of experience (leave blank to skip, or type '0' to abort):
```

```
Years of experience update skipped.
```

```
Press Enter to continue...
```

Explanation : The doctor details are updated step by step where users can skip the details that do not need to be updated. When the new details are entered, "<detail> updated successfully!" will be displayed while pressing Enter will allow the user to skip the part. After all new details have been

updated, the system will ask the user to press Enter to continue (back to the main page of the **Doctor Management**).

3.4.4 View Doctors

```
=== All Doctors ===  
  
D4467 - Zhang Wei  
D4468 - Sarah Johnson  
D4469 - Michael Chen  
D4470 - Emma Williams  
D4471 - Raj Patel  
D4472 - Maria Garcia  
D4473 - James Wilson  
D4474 - Liu Yang  
D4475 - Ahmed Hassan  
D4476 - Sofia Martinez  
D4477 - David Kim  
Enter doctor ID to view details (or type '0' to abort):
```

Explanation : When the user enters "4" in the main page of the **Doctor Management**, it will go to the **View Doctors** section. All the doctors will be displayed in a list. User is required to enter the doctor ID for the doctor he/she wants to view.

3.4.4.1 View Doctors (After chosen a doctor to view)

```
=== All Doctors ===  
  
D4467 - Zhang Wei  
D4468 - Sarah Johnson  
D4469 - Michael Chen  
D4470 - Emma Williams  
D4471 - Raj Patel  
D4472 - Maria Garcia  
D4473 - James Wilson  
D4474 - Liu Yang  
D4475 - Ahmed Hassan  
D4476 - Sofia Martinez  
D4477 - David Kim  
Enter doctor ID to view details (or type '0' to abort): D4474  
  
=== Doctor Details ===  
  
Staff Details:  
Person ID      : D4474  
Name           : Liu Yang  
Address        : 654 Health Park  
Phone Number   : 0164567890  
Gender         : F  
Age            : 39  
Department     : Urology  
Shift          : Evening  
Experience     : 14  
  
Press Enter to continue...
```

Explanation : After entering the doctor ID, the doctor details with that ID will be displayed in a box with clean format. The system will ask the user to press Enter to continue (back to the main page of the **Doctor Management**).

3.4.5 Back to Main Menu

Manage Doctors	
Option	Description
1	Add Doctor
2	Remove Doctor
3	Update Doctor Details
4	View Doctors
0	Back to Main Menu

Choose an option:

Note : Full page image can refer back to the image in 3.4

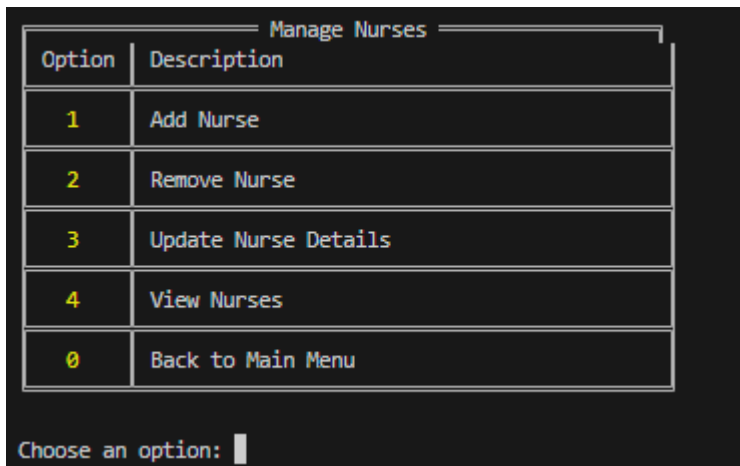
Main Menu	
Option	Description
1	Manage Rooms
2	Manage Patients
3	Manage Doctors
4	Manage Nurses
5	Manage Appointments
6	Manage Medical Records
7	Search/View Data
8	Analytics Dashboard
9	Change Password
0	Exit

Choose an option:

Note : Full page image can refer back to the image in 3.1.2

Explanation : When entering "0" in the main page of the **Doctor Management**, the user will go back to the **Main Menu**, where the user can continue with other sections of the system as in the image shown above.

3.5 Nurse Management



Option	Description
1	Add Nurse
2	Remove Nurse
3	Update Nurse Details
4	View Nurses
0	Back to Main Menu

Choose an option: █

Explanation : After entering "4" in the **Main Menu**, the user will go to the **Nurse Management** section. A menu of all available functions for the section will be displayed. User is required to choose an option to perform a specific function of the **Nurse Management**.

3.5.1 Add Nurse

Example Input Format for Adding a Nurse	
Field	Example Value
Name	Sarah Johnson
Age	28
Gender	M (Male) or F (Female)
Address	123-Main-St-City
Phone Number	1234567890
Department	Emergency
Shift	Night
Years of Experience	5

Enter nurse name (e.g., Jane Smith) or type 'cancel' to abort:

Explanation : When the user enters "1" in the main page of the **Nurse Management**, it will lead the user to the **Add Nurse** section. A sample input will be displayed for better understanding and the system will ask the user to enter the details needed to add a new nurse, the same as the details shown in the sample input.

3.5.1.1 Add Nurse (After adding a nurse)

Example Input Format for Adding a Nurse	
Field	Example Value
Name	Sarah Johnson
Age	28
Gender	M (Male) or F (Female)
Address	123-Main-St-City
Phone Number	1234567890
Department	Emergency
Shift	Night
Years of Experience	5

Enter nurse name (e.g., Jane Smith) or type 'cancel' to abort: Cappuchino Assassino
Enter nurse age (e.g., 30) or type 'cancel' to abort: 20
Enter nurse gender (M/F) or type 'cancel' to abort: M
Enter nurse address (e.g., 123 Main St, City) or type 'cancel' to abort: 756 Assassin St, Japan
Enter nurse phone number (e.g., 1234567890) or type 'cancel' to abort: 9182783400
Enter nurse department (e.g., ICU) or type 'cancel' to abort: ICU
Enter nurse shift (e.g., Morning, Night) or type 'cancel' to abort: Night
Enter nurse years of experience (e.g., 5) or type 'cancel' to abort: 3
Nurse added successfully!

Press Enter to continue...

Explanation : After all details needed for adding a new nurse have been entered, "Nurse added successfully" will be displayed and ask the user to press Enter to continue (back to the main page of the **Nurse Management**).

3.5.2 Remove Nurse

```
=== All Nurses ===  
  
N0002    - Sarah Johnson  
N0003    - Michael Chen  
N0004    - Emma Williams  
N0005    - Raj Patel  
N0006    - Maria Garcia  
N0007    - James Wilson  
N0008    - Liu Yang  
N0009    - Ahmed Hassan  
N0010    - Sofia Martinez  
N0011    - David Kim  
N9794    - GAYGAY  
N6886    - Cappuchino Assassino  
  
Enter nurse ID to remove (or type '0' to abort):
```

Explanation : When the user enters "2" in the main page of the **Nurse Management**, it will go to the **Remove Nurse** section. All the nurses will be displayed in a list. User is required to enter the nurse ID for the nurse who needs to be removed.

3.5.2.1 Remove Nurse (After chosen a nurse to remove)

```
=== All Nurses ===  
  
N0002    - Sarah Johnson  
N0003    - Michael Chen  
N0004    - Emma Williams  
N0005    - Raj Patel  
N0006    - Maria Garcia  
N0007    - James Wilson  
N0008    - Liu Yang  
N0009    - Ahmed Hassan  
N0010    - Sofia Martinez  
N0011    - David Kim  
N9794    - GAYGAY  
N6886    - Cappuchino Assassino  
  
Enter nurse ID to remove (or type '0' to abort): N6886  
Nurse removed successfully!  
  
Press Enter to continue...
```

Explanation : After entering the nurse ID to be removed, "Nurse removed successfully!" will be displayed and ask the user to press **Enter** to continue (back to the main page of the **Nurse Management**).

3.5.3 Update Nurse Details

```

=== All Nurses ===

N0002    - Sarah Johnson
N0003    - Michael Chen
N0004    - Emma Williams
N0005    - Raj Patel
N0006    - Maria Garcia
N0007    - James Wilson
N0008    - Liu Yang
N0009    - Ahmed Hassan
N0010    - Sofia Martinez
N0011    - David Kim
N9794    - GAYGAY
  
```

Example Input Format for Adding a Nurse	
Field	Example Value
Name	Sarah Johnson
Age	28
Gender	M (Male) or F (Female)
Address	123-Main-St-City
Phone Number	1234567890
Department	Emergency
Shift	Night
Years of Experience	5

Enter nurse ID to update (or type '0' to abort):

Explanation : When the user enters "3" in the main page of the **Nurse Management**, it will lead the user to the **Update Nurse Details** section. All the nurses will be displayed in a list and a sample input required for updating nurse details will be displayed for better understanding. Then, the system will ask the user to enter the details needed to add a new nurse, the same as the details shown in the sample input.

3.5.3.1 Update Nurse Details (After updating a nurse detail)

```

=== All Nurses ===

N0002    - Sarah Johnson
N0003    - Michael Chen
N0004    - Emma Williams
N0005    - Raj Patel
N0006    - Maria Garcia
N0007    - James Wilson
N0008    - Liu Yang
N0009    - Ahmed Hassan
N0010    - Sofia Martinez
N0011    - David Kim
N9794    - GAYGAY
  
```

Example Input Format for Adding a Nurse	
Field	Example Value
Name	Sarah Johnson
Age	28
Gender	M (Male) or F (Female)
Address	123-Main-St-City
Phone Number	1234567890
Department	Emergency
Shift	Night
Years of Experience	5

Enter nurse ID to update (or type '0' to abort): N9794
Enter new department (leave blank to skip, or type '0' to abort): ICU

Nurse department updated successfully!

Enter new shift (leave blank to skip, or type '0' to abort):
Shift update skipped.
Enter new years of experience (leave blank to skip, or type '0' to abort):
Years of experience update skipped.

Press Enter to continue...

Explanation : The nurse details are updated step by step where users can skip the details that do not need to be updated. When the new details are entered, "<detail> updated successfully!" will be displayed while pressing Enter will allow the user to skip the part. After all new details have been updated, the system will ask the user to press Enter to continue (back to the main page of the **Nurse Management**).

3.5.4 View Nurses

```
=== All Nurses ===  
  
N0002    - Sarah Johnson  
N0003    - Michael Chen  
N0004    - Emma Williams  
N0005    - Raj Patel  
N0006    - Maria Garcia  
N0007    - James Wilson  
N0008    - Liu Yang  
N0009    - Ahmed Hassan  
N0010    - Sofia Martinez  
N0011    - David Kim  
N9794    - GAYGAY  
  
Enter nurse ID to view details (or type '0' to abort):
```

Explanation : Entering "4" in the main page of the **Nurse Management** will go to the **View Nurse** section. User is required to enter the nurse ID to view the details.

3.5.4.1 View Nurse (After chosen a nurse to view)

```
=== All Nurses ===

N0002    - Sarah Johnson
N0003    - Michael Chen
N0004    - Emma Williams
N0005    - Raj Patel
N0006    - Maria Garcia
N0007    - James Wilson
N0008    - Liu Yang
N0009    - Ahmed Hassan
N0010    - Sofia Martinez
N0011    - David Kim
N9794    - GAYGAY

Enter nurse ID to view details (or type '0' to abort): N9794

=== Nurse Details ===

ID       : N9794
Name     : GAYGAY
Address  : main
Phone    : 123
Gender   : M
Age      : 10
Department : ICU
Shift    : nightNight
Experience : 5 years

Press Enter to continue...
```

Explanation : After entering the nurse ID, the nurse details with that ID will be shown in a box. Once finished viewing, the user is asked to press Enter to continue (back to the main page of the **Nurse Management**).

3.5.5 Back to Main Menu

Option	Description
1	Add Nurse
2	Remove Nurse
3	Update Nurse Details
4	View Nurses
0	Back to Main Menu

Choose an option:

Note : Full page image can refer back to the image in 3.5

Option	Description
1	Manage Rooms
2	Manage Patients
3	Manage Doctors
4	Manage Nurses
5	Manage Appointments
6	Manage Medical Records
7	Search/View Data
8	Analytics Dashboard
9	Change Password
0	Exit

Choose an option:

Note : Full page image can refer back to the image in 3.1.2

Explanation : Entering "0" will lead the user back to the **Main Menu**.

3.6 Appointment Management

Manage Appointments	
Option	Description
1	Add Appointment
2	Remove Appointment
3	Update Appointment Details
4	View Appointments
0	Back to Main Menu

Choose an option:

Explanation : After entering "5" in the **Main Menu**, the user will go to the **Appointment Management** section. A menu of all available functions for the section will be displayed. User is required to choose an option to perform a specific function of the **Appointment Management**.

3.6.1 Add Appointment

```

=== Schedule New Appointment ===
(Type '0' at any prompt to cancel the appointment scheduling process)

=== All Patients ===
+-----+-----+-----+
| P0001 - John Smith | | P0002 - Emily Johnson | | P0003 - Michael Brown |
| Age: 45 | Gender: M | | Age: 32 | Gender: F | | Age: 67 | Gender: M |
+-----+-----+-----+
| P0004 - Sarah Wilson | | P0005 - David Moore | | P0006 - Jessica Taylor |
| Age: 28 | Gender: F | | Age: 53 | Gender: M | | Age: 41 | Gender: F |
+-----+-----+-----+
| P0007 - William Anderson | | P0008 - Jennifer Thomas | | P0009 - Robert Jackson |
| Age: 72 | Gender: M | | Age: 38 | Gender: F | | Age: 59 | Gender: M |
+-----+-----+-----+
| P0010 - Lisa White | | P0011 - James Harris | | P0012 - Patricia Martin |
| Age: 25 | Gender: F | | Age: 49 | Gender: M | | Age: 63 | Gender: F |
+-----+-----+-----+
| P0013 - Thomas Thompson | | P0014 - Mary Garcia | | P0015 - Charles Martinez |
| Age: 36 | Gender: M | | Age: 51 | Gender: F | | Age: 44 | Gender: M |
+-----+-----+-----+
| P0016 - Elizabeth Robinson | | P0017 - Daniel Clark | | P0018 - Susan Rodriguez |
| Age: 77 | Gender: F | | Age: 33 | Gender: M | | Age: 58 | Gender: F |
+-----+-----+-----+
| P0019 - Matthew Lewis | | P0020 - Nancy Lee | | P0088 - Tung Tung Sahur |
| Age: 42 | Gender: M | | Age: 69 | Gender: F | | Age: 20 | Gender: M |
+-----+-----+-----+

Total Patients: 21
Enter patient ID (format: Pxxxx or 0 to cancel): 

```

Explanation : After entering "1" in the main page of the **Appointment Management**, the user will go to the **Add Appointment** section. The user is required to enter his / her patient ID and then choose the doctor he / she wants to make an appointment with.

3.6.1.1 Add Appointment (After adding an appointment)

```

=== Schedule New Appointment ===
(Type '0' at any prompt to cancel the appointment scheduling process)

=== All Patients ===

+-----+ +-----+ +-----+
| P0001 - John Smith | | P0002 - Emily Johnson | | P0003 - Michael Brown |
| Age: 45 | Gender: M | | Age: 32 | Gender: F | | Age: 67 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0004 - Sarah Wilson | | P0005 - David Moore | | P0006 - Jessica Taylor |
| Age: 28 | Gender: F | | Age: 53 | Gender: M | | Age: 41 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0007 - William Anderson | | P0008 - Jennifer Thomas | | P0009 - Robert Jackson |
| Age: 72 | Gender: M | | Age: 38 | Gender: F | | Age: 59 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0010 - Lisa White | | P0011 - James Harris | | P0012 - Patricia Martin |
| Age: 25 | Gender: F | | Age: 49 | Gender: M | | Age: 63 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0013 - Thomas Thompson | | P0014 - Mary Garcia | | P0015 - Charles Martinez |
| Age: 36 | Gender: M | | Age: 51 | Gender: F | | Age: 44 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0016 - Elizabeth Robinson | | P0017 - Daniel Clark | | P0018 - Susan Rodriguez |
| Age: 77 | Gender: F | | Age: 33 | Gender: M | | Age: 58 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0019 - Matthew Lewis | | P0020 - Nancy Lee | | P9088 - Tung Tung Sahur |
| Age: 42 | Gender: M | | Age: 69 | Gender: F | | Age: 20 | Gender: M |
+-----+ +-----+ +-----+

Total Patients: 21
Enter patient ID (format: Pxxxx or 0 to cancel): P9088

```

Explanation : After the user enters the patient ID, the user will be guided to the image below to choose the doctor who is in-charge for this appointment.

```

=== All Doctors ===
D4467 - Zhang Wei
D4468 - Sarah Johnson
D4469 - Michael Chen
D4470 - Emma Williams
D4471 - Raj Patel
D4472 - Maria Garcia
D4473 - James Wilson
D4474 - Liu Yang
D4475 - Ahmed Hassan
D4476 - Sofia Martinez
D4477 - David Kim
Enter doctor ID (format: Dxxxx or 0 to cancel): D4474

=== All Rooms ===

+-----+ +-----+ +-----+
| R72[Available] | | R54[Available] | | R47[Available] |
| Type: ICU | | Type: ICU | | Type: ICU |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R45[Available] | | R13[Available] | | R57[Available] |
| Type: ICU | | Type: ICU | | Type: ICU |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R81[Available] | | R75[ Occupied] | | R26[Available] |
| Type: ICU | | Type: Isolation | | Type: Emergency |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R40[ Occupied] | | R94[Available] | | R92[Available] |
| Type: Ward | | Type: Emergency | | Type: Emergency |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R63[ Occupied] | | R20[ Occupied] | | R78[Available] |
| Type: Ward | | Type: Operation | | Type: Ward |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R12[Available] | | R91[Available] | | R22[ Occupied] |
| Type: Emergency | | Type: Operation | | Type: Isolation |
+-----+ +-----+ +-----+

Enter room ID (format: Rxx or 0 to cancel): R92

```

Explanation : After the user enters the doctor ID, the user will be guided to choose the room where the patient stays. Then the user will be guided to the image below to book the date and time of the appointment this time.

```

Enter room ID (format: Rxx or 0 to cancel): R92

=== Available Dates ===
1. 25/04/2025
2. 26/04/2025
3. 27/04/2025
4. 28/04/2025
5. 29/04/2025
6. 30/04/2025
7. 01/05/2025
Enter the date number (or 0 to cancel): 2

=== Available Times for 26/04/2025 ===
1. 09:00
2. 10:00
3. 11:00
4. 12:00
5. 13:00
6. 14:00
7. 15:00
8. 16:00
9. 17:00
Enter the time number (or 0 to cancel): 2

=== Appointment Details ===
Patient ID: P9088
Doctor ID: D4474
Room ID: R92
Date & Time: 26/04/2025 10:00
Confirm appointment (Y/N)? Y
Appointment scheduled successfully!

```

Press Enter to continue...

Explanation : After finishing entering the patient ID and choosing the doctor, the user is required to choose an available date and time for the appointment which will be displayed as in the image above. After finishing all the steps, the appointment details will be shown with the message "Appointment scheduled successfully!". User is required to press Enter to continue (back to the main page of the **Appointment Management**).

3.6.2 Remove Appointment

Appointment ID	Date & Time	Status	Doctor	Room
A7225	18/03/2025 09:00	Scheduled	P8539	D9750
A7226	20/03/2025 14:30	Scheduled	P8540	D9751
A7227	22/03/2025 11:15	Active	P8541	D9752
A7228	25/03/2025 16:00	Scheduled	P8542	D9753
A7229	28/03/2025 10:45	Active	P8543	D9754
A7230	15/04/2025 09:30	Scheduled	P8544	D9755
A7231	18/04/2025 13:45	Active	P8545	D9756
A7232	22/04/2025 11:00	Scheduled	P8546	D9757
A7233	02/05/2025 10:15	Active	P8547	D9758
A7234	05/05/2025 15:30	Scheduled	P8548	D9759
A7235	10/05/2025 14:00	Active	P8549	D9760
A2473	26/04/2025 10:00	Scheduled	P9088	D4474

Enter the appointmentID: █

Explanation : After entering "2" in the main page of **Appointment Management**, it will go to the **Remove Appointment** section. All the scheduled appointments will be displayed in a table format with all of the details. User is required to enter the appointment ID to be removed.

3.6.2.1 Remove Appointment (After chosen an appointment to remove)

Appointment ID	Date & Time	Status	Doctor	Room
A7225	18/03/2025 09:00	Scheduled	P8539	D9750
A7226	20/03/2025 14:30	Scheduled	P8540	D9751
A7227	22/03/2025 11:15	Active	P8541	D9752
A7228	25/03/2025 16:00	Scheduled	P8542	D9753
A7229	28/03/2025 10:45	Active	P8543	D9754
A7230	15/04/2025 09:30	Scheduled	P8544	D9755
A7231	18/04/2025 13:45	Active	P8545	D9756
A7232	22/04/2025 11:00	Scheduled	P8546	D9757
A7233	02/05/2025 10:15	Active	P8547	D9758
A7234	05/05/2025 15:30	Scheduled	P8548	D9759
A7235	10/05/2025 14:00	Active	P8549	D9760
A2473	26/04/2025 10:00	Scheduled	P9088	D4474

Enter the appointmentID: A2473
The appointment have been removed successfully.

Press Enter to continue...

Explanation : After entering the appointment ID wanted to be removed, a message "The appointment has been removed successfully." will be displayed and ask the user to press Enter to continue (back to the main page of the **Appointment Management**). The appointment with that appointment ID will be removed.

3.6.3 Update Appointment Details

Appointment ID	Date & Time	Status	Doctor	Room
A7225	18/03/2025 09:00	Scheduled	P8539	D9750
A7226	20/03/2025 14:30	Scheduled	P8540	D9751
A7227	22/03/2025 11:15	Active	P8541	D9752
A7228	25/03/2025 16:00	Scheduled	P8542	D9753
A7229	28/03/2025 10:45	Active	P8543	D9754
A7230	15/04/2025 09:30	Scheduled	P8544	D9755
A7231	18/04/2025 13:45	Active	P8545	D9756
A7232	22/04/2025 11:00	Scheduled	P8546	D9757
A7233	02/05/2025 10:15	Active	P8547	D9758
A7234	05/05/2025 15:30	Scheduled	P8548	D9759
A7235	10/05/2025 14:00	Active	P8549	D9760

Enter appointmentID:

Explanation : While entering "3" in the main page of **Appointment Management**, the user will go to the **Update Appointment Details** section. All the appointments will be displayed in a table format. User is required to enter the appointment ID that the user wanted to update its details.

3.6.3.1 Update Appointment Details (After updating an appointment detail)

Appointment ID	Date & Time	Status	Doctor	Room
A7225	18/03/2025 09:00	Scheduled	P8539	D9750
A7226	20/03/2025 14:30	Scheduled	P8540	D9751
A7227	22/03/2025 11:15	Active	P8541	D9752
A7228	25/03/2025 16:00	Scheduled	P8542	D9753
A7229	28/03/2025 10:45	Active	P8543	D9754
A7230	15/04/2025 09:30	Scheduled	P8544	D9755
A7231	18/04/2025 13:45	Active	P8545	D9756
A7232	22/04/2025 11:00	Scheduled	P8546	D9757
A7233	02/05/2025 10:15	Active	P8547	D9758
A7234	05/05/2025 15:30	Scheduled	P8548	D9759
A7235	10/05/2025 14:00	Active	P8549	D9760

Enter appointmentID: A7235

Status codes:
 1: Scheduled
 2: Active

Enter the new status (0 to cancel): 1
 The appointment has been updated successfully.

Press Enter to continue...

Explanation : After entering the appointment ID, the user has to choose the new status for the appointment. Once confirmed, the user is asked to press Enter to continue.

3.6.4 View Appointments

Appointment ID	Date & Time	Status	Doctor	Room
A7225	18/03/2025 09:00	Scheduled	P8539	D9750
A7226	20/03/2025 14:30	Scheduled	P8540	D9751
A7227	22/03/2025 11:15	Active	P8541	D9752
A7228	25/03/2025 16:00	Scheduled	P8542	D9753
A7229	28/03/2025 10:45	Active	P8543	D9754
A7230	15/04/2025 09:30	Scheduled	P8544	D9755
A7231	18/04/2025 13:45	Active	P8545	D9756
A7232	22/04/2025 11:00	Scheduled	P8546	D9757
A7233	02/05/2025 10:15	Active	P8547	D9758
A7234	05/05/2025 15:30	Scheduled	P8548	D9759
A7235	10/05/2025 14:00	Scheduled	P8549	D9760

Press Enter to continue...

Explanation : When entering "4" in the main page of **Appointment Management**, it will go to the **View Appointment** section. All the appointments along with each detail will be displayed in a table

format. Once finish viewing, the user needs to press Enter to continue (back to the main page of the **Appointment Management**).

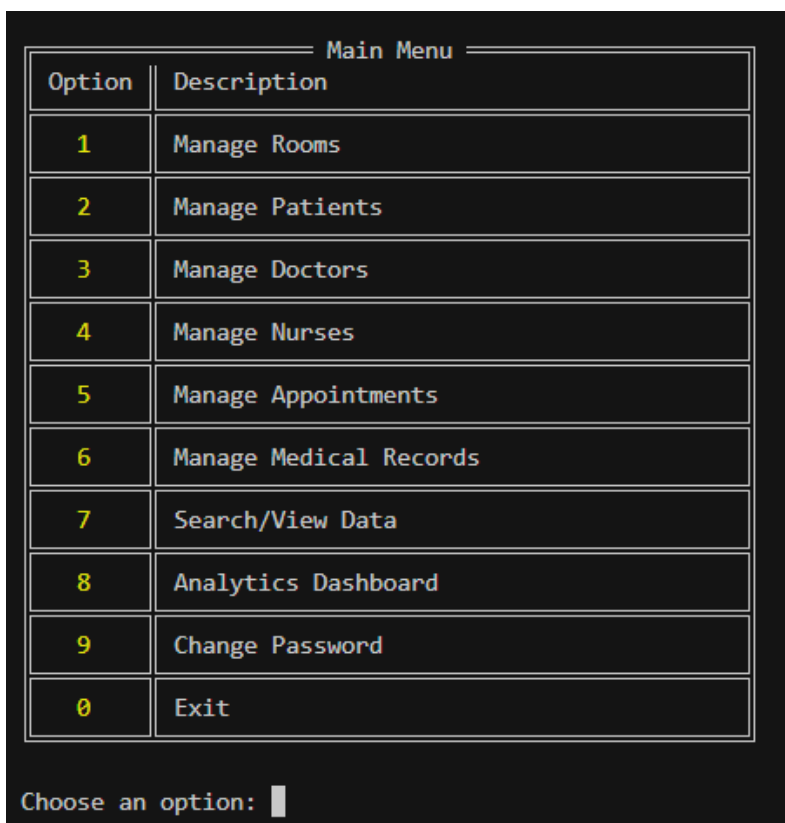
3.6.5 Back to Main Menu



Option	Description
1	Add Appointment
2	Remove Appointment
3	Update Appointment Details
4	View Appointments
0	Back to Main Menu

Choose an option: █

Note : Full page image can refer back to the image in 3.6



Option	Description
1	Manage Rooms
2	Manage Patients
3	Manage Doctors
4	Manage Nurses
5	Manage Appointments
6	Manage Medical Records
7	Search/View Data
8	Analytics Dashboard
9	Change Password
0	Exit

Choose an option: █

Note : Full page image can refer back to the image in 3.1.2

Explanation : Entering "0" will lead the user back to the **Main Menu**.

3.7 Medical Record Management

Manage Medical Records	
Option	Description
1	Add Medical Record
2	Remove Medical Record
3	Update Medical Record Details
4	View Medical Records
0	Back to Main Menu

Choose an option:

Explanation : After entering "6" in the **Main Menu**, the user will go to the **Medical Record Management** section. A menu of all available functions for the section will be displayed. User is required to choose an option to perform a specific function of the **Medical Record Management**.

3.7.1 Add Medical Record

```

=== All Patients ===

+-----+ +-----+ +-----+
| P0001 - John Smith | | P0002 - Emily Johnson | | P0003 - Michael Brown |
| Age: 45 | Gender: M | | Age: 32 | Gender: F | | Age: 67 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0004 - Sarah Wilson | | P0005 - David Moore | | P0006 - Jessica Taylor |
| Age: 28 | Gender: F | | Age: 53 | Gender: M | | Age: 41 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0007 - William Anderson | | P0008 - Jennifer Thomas | | P0009 - Robert Jackson |
| Age: 72 | Gender: M | | Age: 38 | Gender: F | | Age: 59 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0010 - Lisa White | | P0011 - James Harris | | P0012 - Patricia Martin |
| Age: 25 | Gender: F | | Age: 49 | Gender: M | | Age: 63 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0013 - Thomas Thompson | | P0014 - Mary Garcia | | P0015 - Charles Martinez |
| Age: 36 | Gender: M | | Age: 51 | Gender: F | | Age: 44 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0016 - Elizabeth Robinson | | P0017 - Daniel Clark | | P0018 - Susan Rodriguez |
| Age: 77 | Gender: F | | Age: 33 | Gender: M | | Age: 58 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0019 - Matthew Lewis | | P0020 - Nancy Lee | | P0088 - GAY |
| Age: 42 | Gender: M | | Age: 69 | Gender: F | | Age: 19 | Gender: M |
+-----+ +-----+ +-----+

Total Patients: 21
Enter the patient ID (0 to cancel): 

```

Explanation : Entering "1" in the main page of the **Medical Record Management** will lead the user to the **Add Medical Record** section. All the existing patients will be displayed in a neatly organized grid format along with the number of total patients listed at the bottom. User is prompted to enter the patient ID to create a new medical record.

3.7.1.1 Add Medical Record (After adding a medical record)

```

Total Patients: 21
Enter the patient ID (0 to cancel): P0001
Enter the diagnosis (0 to cancel): Flu with Headache
Enter the prescription (0 to cancel): Paracetamol

Medical record added successfully! Record ID: MR4169

Press Enter to continue...

```

Explanation : After choosing the patient, the user needs to enter the medical record details. Once finished, "Medical record added successfully!" will be shown with the record ID. User is prompted to press Enter to continue (back to the main page of the **Medical Record Management**).

3.7.2 Remove Medical Record

```

=== All Patients ===

+-----+ +-----+ +-----+
| P0001 - John Smith | | P0002 - Emily Johnson | | P0003 - Michael Brown |
| Age: 45 | Gender: M | | Age: 32 | Gender: F | | Age: 67 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0004 - Sarah Wilson | | P0005 - David Moore | | P0006 - Jessica Taylor |
| Age: 28 | Gender: F | | Age: 53 | Gender: M | | Age: 41 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0007 - William Anderson | | P0008 - Jennifer Thomas | | P0009 - Robert Jackson |
| Age: 72 | Gender: M | | Age: 38 | Gender: F | | Age: 59 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0010 - Lisa White | | P0011 - James Harris | | P0012 - Patricia Martin |
| Age: 25 | Gender: F | | Age: 49 | Gender: M | | Age: 63 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0013 - Thomas Thompson | | P0014 - Mary Garcia | | P0015 - Charles Martinez |
| Age: 36 | Gender: M | | Age: 51 | Gender: F | | Age: 44 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0016 - Elizabeth Robinson | | P0017 - Daniel Clark | | P0018 - Susan Rodriguez |
| Age: 77 | Gender: F | | Age: 33 | Gender: M | | Age: 58 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0019 - Matthew Lewis | | P0020 - Nancy Lee | | P9088 - GAY |
| Age: 42 | Gender: M | | Age: 69 | Gender: F | | Age: 19 | Gender: M |
+-----+ +-----+ +-----+

Total Patients: 21
Enter patient ID to view their medical records (0 to cancel):

```

Explanation : When entering "2" in the main page of the **Medical Record Management**, the user will go to the **Remove Medical Record** section. All the existing patients will be displayed in a neatly organized grid format along with the number of total patients listed at the bottom. User is prompted to enter the patient ID whose medical record needs to be removed.

3.7.2.1 Remove Medical Record (After chosen a medical record to remove)

```
=== Medical Records for Patient P0001 ===
Record ID: MR0001
Date Created: 2025-04-08T10:00
Diagnoses: Flu;FLUUU->fever
Prescriptions: Paracetamol->paracetamolz->panadol
Treatments: none

Record ID: MR0005
Date Created: 2025-04-09T11:30
Diagnoses: Flu
Prescriptions: Paracetamol
Treatments: Rest and hydration

Record ID: MR0006
Date Created: 2025-04-10T14:00
Diagnoses: Flu
Prescriptions: Ibuprofen
Treatments: Cold compress

Record ID: MR0007
Date Created: 2025-04-11T09:00
Diagnoses: Flu
Prescriptions: Decongestant
Treatments: Steam inhalation

Record ID: MR0008
Date Created: 2025-04-12T16:30
Diagnoses: Flu
Prescriptions: Cough syrup
Treatments: Bed rest

Record ID: MR5728
Date Created: 2025-04-24T10:17:11.835928500
Diagnoses:
Prescriptions:
Treatments:

Record ID: MR3848
Date Created: 2025-04-24T10:18:48.481558300
Diagnoses: Flu with headache->Paracetamol->Bed rest
Prescriptions:
Treatments:

Record ID: MR4169
Date Created: 2025-04-24T10:21:11.787279900
Diagnoses: Flu with Headache
Prescriptions: Paracetamol
Treatments:

Enter the record ID to remove (0 to cancel): MR4169

Medical record removed successfully!

Press Enter to continue...
```

Explanation : After entering the patient ID, its medical record will be displayed in a list. User needs to enter the record ID that needs to be removed based on the list. Once confirmed, "Medical record removed successfully!" will be displayed and ask the user to press Enter to continue (back to the main page of the **Medical Record Management**).

3.7.3 Update Medical Record Details

```

=== All Patients ===
+-----+ +-----+ +-----+
| P0001 - John Smith | | P0002 - Emily Johnson | | P0003 - Michael Brown |
| Age: 45 | Gender: M | | Age: 32 | Gender: F | | Age: 67 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0004 - Sarah Wilson | | P0005 - David Moore | | P0006 - Jessica Taylor |
| Age: 28 | Gender: F | | Age: 53 | Gender: M | | Age: 41 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0007 - William Anderson | | P0008 - Jennifer Thomas | | P0009 - Robert Jackson |
| Age: 72 | Gender: M | | Age: 38 | Gender: F | | Age: 59 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0010 - Lisa White | | P0011 - James Harris | | P0012 - Patricia Martin |
| Age: 25 | Gender: F | | Age: 49 | Gender: M | | Age: 63 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0013 - Thomas Thompson | | P0014 - Mary Garcia | | P0015 - Charles Martinez |
| Age: 36 | Gender: M | | Age: 51 | Gender: F | | Age: 44 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0016 - Elizabeth Robinson | | P0017 - Daniel Clark | | P0018 - Susan Rodriguez |
| Age: 77 | Gender: F | | Age: 33 | Gender: M | | Age: 58 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0019 - Matthew Lewis | | P0020 - Nancy Lee | | P9088 - GAY |
| Age: 42 | Gender: M | | Age: 69 | Gender: F | | Age: 19 | Gender: M |
+-----+ +-----+ +-----+

Total Patients: 21

Enter patient ID to view their medical records (0 to cancel):

```

Explanation : When entering "3" in the main page of **Medical Record Management**, the user will go to the **Update Medical Record Details** section. All the existing patients will be displayed in a neatly organized grid format along with the number of total patients listed at the bottom. User is prompted to enter the patient ID needed to update medical records.

3.7.3.1 Update Medical Record Details (After updating a medical record detail)

```
Enter patient ID to view their medical records (0 to cancel): P0001

Medical Records for Patient ID: P0001

=== Medical Records for Patient P0001 ===
Record ID: MR0001
Date Created: 2025-04-08T10:00
Diagnoses: Flu;FLUUU->fever
Prescriptions: Paracetamol->paracetamolz->panadol
Treatments: none

Record ID: MR0005
Date Created: 2025-04-09T11:30
Diagnoses: Flu
Prescriptions: Paracetamol
Treatments: Rest and hydration

Record ID: MR0006
Date Created: 2025-04-10T14:00
Diagnoses: Flu
Prescriptions: Ibuprofen
Treatments: Cold compress

Record ID: MR0007
Date Created: 2025-04-11T09:00
Diagnoses: Flu
Prescriptions: Decongestant
Treatments: Steam inhalation

Record ID: MR0008
Date Created: 2025-04-12T16:30
Diagnoses: Flu
Prescriptions: Cough syrup
Treatments: Bed rest

Record ID: MR5728
Date Created: 2025-04-24T10:17:11.835928500
Diagnoses:
Prescriptions:
Treatments:

Record ID: MR3848
Date Created: 2025-04-24T10:18:48.481558300
Diagnoses: Flu with headache->Paracetamol->Bed rest
Prescriptions:
Treatments:

Enter the record ID to update (0 to cancel): MR3848
Enter the new diagnosis (0 to cancel): Flu with headache
Enter the new prescription (0 to cancel): Pain Killer
Enter the new treatment (0 to cancel): Bed Rest with MC

Medical record updated successfully!

Press Enter to continue...
```

Explanation : After entering the patient ID, its medical records will be shown and the user is required to choose the medical record needed to update. Updating a record requires the user to rewrite its details. Once finished updating, "Medical record updated successfully!" will be displayed and ask the user to press Enter to continue (back to the main page of the **Medical Record Management**).

3.7.4 View Medical Record

=== All Patients ===		
P0001 - John Smith Age: 45 Gender: M	P0002 - Emily Johnson Age: 32 Gender: F	P0003 - Michael Brown Age: 67 Gender: M
P0004 - Sarah Wilson Age: 28 Gender: F	P0005 - David Moore Age: 53 Gender: M	P0006 - Jessica Taylor Age: 41 Gender: F
P0007 - William Anderson Age: 72 Gender: M	P0008 - Jennifer Thomas Age: 38 Gender: F	P0009 - Robert Jackson Age: 59 Gender: M
P0010 - Lisa White Age: 25 Gender: F	P0011 - James Harris Age: 49 Gender: M	P0012 - Patricia Martin Age: 63 Gender: F
P0013 - Thomas Thompson Age: 36 Gender: M	P0014 - Mary Garcia Age: 51 Gender: F	P0015 - Charles Martinez Age: 44 Gender: M
P0016 - Elizabeth Robinson Age: 77 Gender: F	P0017 - Daniel Clark Age: 33 Gender: M	P0018 - Susan Rodriguez Age: 58 Gender: F
P0019 - Matthew Lewis Age: 42 Gender: M	P0020 - Nancy Lee Age: 69 Gender: F	P9088 - Tung Tung Sahur Age: 20 Gender: M
Total Patients: 21		
Enter patient ID to view medical records (0 to cancel):		

Explanation : When entering "4" in the main page of **Medical Record Management**, the user will go to the **View Medical Record** section. All the existing patients will be displayed in a neatly organized grid format along with the number of total patients listed at the bottom. User is required to enter a patient ID to view the medical records.

3.7.4.1 View Medical Records (Chosen an appointment to view has records)

```
Total Patients: 21
Enter patient ID to view medical records (0 to cancel): P0001

=== Medical Records for Patient P0001 ===
Record ID: MR0001
Date Created: 2025-04-08T10:00
Diagnoses: Flu;FLUUU->fever
Prescriptions: Paracetamol->paracetamolz->panadol
Treatments: none

Record ID: MR0005
Date Created: 2025-04-09T11:30
Diagnoses: Flu
Prescriptions: Paracetamol
Treatments: Rest and hydration

Record ID: MR0006
Date Created: 2025-04-10T14:00
Diagnoses: Flu
Prescriptions: Ibuprofen
Treatments: Cold compress

Record ID: MR0007
Date Created: 2025-04-11T09:00
Diagnoses: Flu
Prescriptions: Decongestant
Treatments: Steam inhalation

Record ID: MR0008
Date Created: 2025-04-12T16:30
Diagnoses: Flu
Prescriptions: Cough syrup
Treatments: Bed rest

Press Enter to continue...
```

Explanation : After the user enters the patient ID, the patient's medical records will be listed. Once finished viewing, the user is required to press Enter to continue (back to main page of the **Medical Record Management**)

3.7.4.2 View Medical Records (Chosen an appointment to view has no records)

```

=== All Patients ===

+-----+ +-----+ +-----+
| P0001 - John Smith | | P0002 - Emily Johnson | | P0003 - Michael Brown |
| Age: 45 | Gender: M | | Age: 32 | Gender: F | | Age: 67 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0004 - Sarah Wilson | | P0005 - David Moore | | P0006 - Jessica Taylor |
| Age: 28 | Gender: F | | Age: 53 | Gender: M | | Age: 41 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0007 - William Anderson | | P0008 - Jennifer Thomas | | P0009 - Robert Jackson |
| Age: 72 | Gender: M | | Age: 38 | Gender: F | | Age: 59 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0010 - Lisa White | | P0011 - James Harris | | P0012 - Patricia Martin |
| Age: 25 | Gender: F | | Age: 49 | Gender: M | | Age: 63 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0013 - Thomas Thompson | | P0014 - Mary Garcia | | P0015 - Charles Martinez |
| Age: 36 | Gender: M | | Age: 51 | Gender: F | | Age: 44 | Gender: M |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0016 - Elizabeth Robinson | | P0017 - Daniel Clark | | P0018 - Susan Rodriguez |
| Age: 77 | Gender: F | | Age: 33 | Gender: M | | Age: 58 | Gender: F |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| P0019 - Matthew Lewis | | P0020 - Nancy Lee | | P0088 - Tung Tung Sahur |
| Age: 42 | Gender: M | | Age: 69 | Gender: F | | Age: 20 | Gender: M |
+-----+ +-----+ +-----+

Total Patients: 21
Enter patient ID to view medical records (0 to cancel): P9088

=== Medical Records for Patient P9088 ===
No records found for this patient.

Press Enter to continue...

```

Explanation : If no medical record exists for the patient with the patient ID entered by the user, "No records found for this patient" will be shown in the box.

3.7.5 Back to Main Menu

Option	Description
1	Add Medical Record
2	Remove Medical Record
3	Update Medical Record Details
4	View Medical Records
0	Back to Main Menu

Choose an option:

Note : Full page image can refer back to the image in 3.7

Option	Description
1	Manage Rooms
2	Manage Patients
3	Manage Doctors
4	Manage Nurses
5	Manage Appointments
6	Manage Medical Records
7	Search/View Data
8	Analytics Dashboard
9	Change Password
0	Exit

Choose an option:

Note : Full page image can refer back to the image in 3.1.2

Explanation : Entering "0" will lead the user back to the **Main Menu**.

3.8 Search and View Management

Search/View Data	
Option	Description
1	Search Patients
2	Search Doctors
3	Search Nurses
4	Search Appointments
5	Search Rooms
0	Back to Main Menu

Choose an option (0 to return to main menu):

Explanation : After entering "7" in the **Main Menu**, the user will go to the **Search and View Data** section. A menu of all available functions for the section will be displayed. User is required to choose an option to perform a specific function of the **Medical Record Management**.

3.8.1 Search Patients

```
=== Search Patients ===

[1] Search by Name
[2] Search by Address
[3] Search by Gender
[4] Search by Age Range
[0] Back

Choose search criteria:
```

Explanation : When the user enters "1" in the main page of the **Search and View Data**, it will go to the **Search Patients** section. A menu of several search criteria which indicate data used for the search function for this section will be displayed. User is required to choose one search criteria.

3.8.1.1 Search Patients (Search by name)

```
=== Search Patients ===

[1] Search by Name
[2] Search by Address
[3] Search by Gender
[4] Search by Age Range
[0] Back

Choose search criteria: 1

Enter patient name: Tung Tung Sahur
```

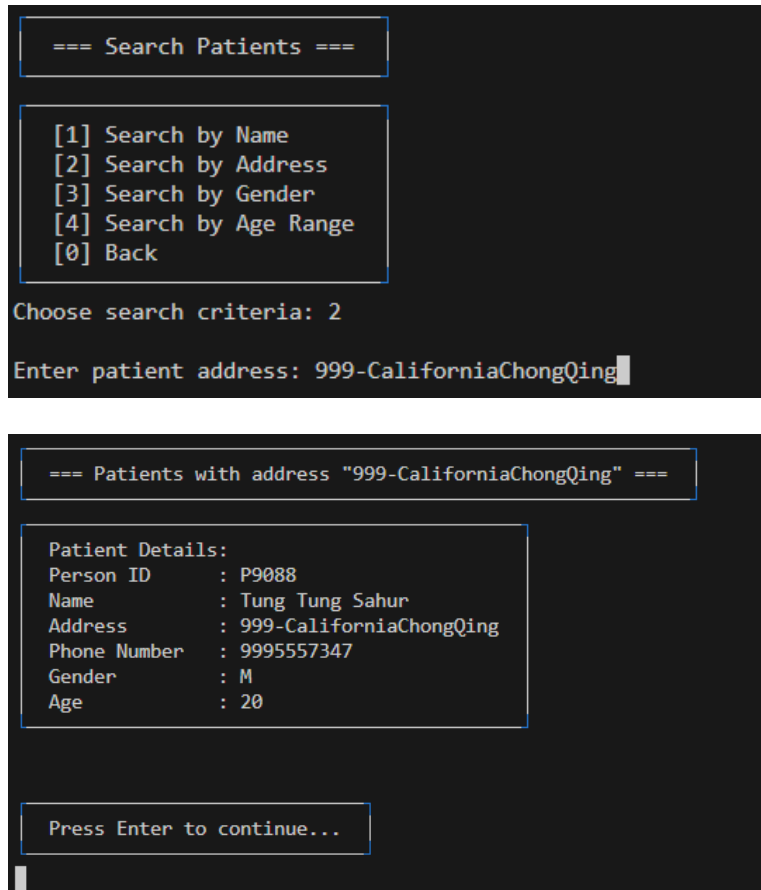
```
=== Patients with name "Tung Tung Sahur" ===

Patient Details:
Person ID      : P9088
Name           : Tung Tung Sahur
Address        : 999-CaliforniaChongQing
Phone Number   : 9995557347
Gender         : M
Age            : 20

Press Enter to continue...
```

Explanation : If the user enters "1", the system will ask the user to enter the **patient's name** needed to search. After entering, all the patient' details of that patient will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Patients**) .

3.8.1.2 Search Patients (Search by address)



```
=== Search Patients ===

[1] Search by Name
[2] Search by Address
[3] Search by Gender
[4] Search by Age Range
[0] Back

Choose search criteria: 2

Enter patient address: 999-CaliforniaChongQing

=== Patients with address "999-CaliforniaChongQing" ===

Patient Details:
Person ID      : P9088
Name           : Tung Tung Sahur
Address        : 999-CaliforniaChongQing
Phone Number   : 9995557347
Gender         : M
Age            : 20

Press Enter to continue...
```

Explanation : If the user enters "2", the system will ask the user to enter the **patient's address** needed to search. After entering, all the patient' details of each patient with that address will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Patients**) .

3.8.1.3 Search Patients (Search by gender)

=== Patients with Gender "M" ===

Patient Details:
Person ID : P0001
Name : John Smith
Address : 123 Main St Springfield NY 12345
Phone Number : 555-123-4567
Gender : M
Age : 45

Patient Details:
Person ID : P0003
Name : Michael Brown
Address : 456 Pine St Georgetown TX 78654
Phone Number : 303-789-1234
Gender : M
Age : 67

Patient Details:
Person ID : P0005
Name : David Moore
Address : 987 Park Ave Salem MA 01970
Phone Number : 617-234-5678
Gender : M
Age : 53

Patient Details:
Person ID : P0007
Name : William Anderson
Address : 159 Sunset Blvd Clinton IA 52732
Phone Number : 563-456-7890
Gender : M
Age : 72

Patient Details:
Person ID : P0009
Name : Robert Jackson
Address : 246 Forest Ave Kingston NH 03848
Phone Number : 603-678-9012
Gender : M
Age : 59

Patient Details:
Person ID : P0013
Name : Thomas Thompson
Address : 482 North St Milton FL 32583
Phone Number : 850-012-3456
Gender : M
Age : 36

Patient Details:
Person ID : P0015
Name : Charles Martinez
Address : 268 East St Ashland OR 97520
Phone Number : 541-234-5678
Gender : M
Age : 44

Patient Details:
Person ID : P0017
Name : Daniel Clark
Address : 837 Center St Greenville SC 29601
Phone Number : 864-456-7890
Gender : M
Age : 33

Patient Details:
Person ID : P0019
Name : Matthew Lewis
Address : 429 Elm St Springfield IL 62701
Phone Number : 217-678-9012
Gender : M
Age : 42

Patient Details:
Person ID : P9088
Name : Tung Tung Sahur
Address : 999-CaliforniaChongQing
Phone Number : 9995557347
Gender : M
Age : 20

Press Enter to continue...

Explanation : If the user enters "3", the system will ask the user to enter the **patient's gender** needed to search. After entering, all the patient' details of each patient with that gender will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to the main page of Search Patients) .

3.8.1.4 Search Patients (Search by age range)

```
=== Patients aged 60-150 ===

Patient Details:
Person ID      : P0003
Name           : Michael Brown
Address        : 456 Pine St Georgetown TX 78654
Phone Number   : 303-789-1234
Gender         : M
Age            : 67

Patient Details:
Person ID      : P0007
Name           : William Anderson
Address        : 159 Sunset Blvd Clinton IA 52732
Phone Number   : 563-456-7890
Gender         : M
Age            : 72

Patient Details:
Person ID      : P0012
Name           : Patricia Martin
Address        : 915 Spring St Manchester CT 06040
Phone Number   : 860-901-2345
Gender         : F
Age            : 63

Patient Details:
Person ID      : P0016
Name           : Elizabeth Robinson
Address        : 594 West St Oakland CA 94601
Phone Number   : 510-345-6789
Gender         : F
Age            : 77

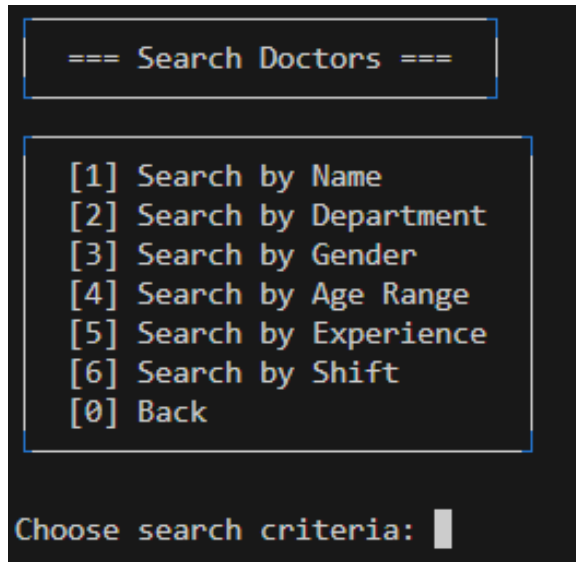
Patient Details:
Person ID      : P0020
Name           : Nancy Lee
Address        : 683 River Rd Riverside WA 98850
Phone Number   : 509-789-0123
Gender         : F
Age            : 69

Press Enter to continue...
```

Note :

Explanation : If the user enters "4", the system will ask the user to enter the **patient's age range** needed to search. After entering, all the patient' details of each patient within that age range will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Patients**) .

3.8.2 Search Doctors



```
=== Search Doctors ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: █
```

Explanation : When the user enters "2" in the main page of the **Search and View Data**, it will go to the **Search Doctor** section. A menu of several search criteria which indicate data used for the search function for this section will be displayed. User is required to choose one search criteria.

3.8.2.1 Search Doctors (Search by Name)

```
=== Doctors named "Zhang Wei" ===

Staff Details:
Person ID      : D4467
Name           : Zhang Wei
Address        : 567 Care Road
Phone Number   : 0165432109
Gender         : M
Age            : 41
Department     : Orthopedics
Shift          : Morning
Experience      : 20

Press Enter to continue...
```

Explanation : If the user enters "1", the system will ask the user to enter the **doctor's name** needed to search. After entering, all the doctor' details of each doctor with that name will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Doctors**) .

3.8.2.2 Search Doctors (Search by Department)

The screenshot displays a terminal window with a dark background and light-colored text. It is divided into two main sections. The left section contains a menu titled '=== Search Doctors ===' with options: [1] Search by Name, [2] Search by Department, [3] Search by Gender, [4] Search by Age Range, [5] Search by Experience, [6] Search by Shift, and [0] Back. Below the menu, it prompts 'Choose search criteria: 2' and 'Select department:' followed by a list of departments: [1] Surgery, [2] Cardiology, [3] Pediatrics, [4] Neurology, and [5] Orthopedics. The prompt 'Choice: ' is followed by a cursor. The right section shows a box titled '=== Doctors in Department "Neurology" ===' containing 'Staff Details:' for a doctor with the following attributes: Person ID : D4469, Name : Michael Chen, Address : 789 Medical Ave, Phone Number : 0169876543, Gender : M, Age : 45, Department : Neurology, Shift : Morning, and Experience : 15. At the bottom of this section is a box that says 'Press Enter to continue...'.

```
=== Search Doctors ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: 2

Select department:
[1] Surgery
[2] Cardiology
[3] Pediatrics
[4] Neurology
[5] Orthopedics
Choice: █

=== Doctors in Department "Neurology" ===

Staff Details:
Person ID      : D4469
Name           : Michael Chen
Address        : 789 Medical Ave
Phone Number   : 0169876543
Gender         : M
Age            : 45
Department     : Neurology
Shift          : Morning
Experience      : 15

Press Enter to continue...
█
```

Explanation : If the user enters "2", the system will ask the user to enter the **doctor's department** needed to search. After entering, all the doctor' details of each doctor within that department will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Doctors**) .

3.8.2.3 Search Doctors (Search by Gender)

=== Search Doctors ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: 3

Select gender:

[1] Male (M)
[2] Female (F)

Choice: █

=== Doctors with Gender "F" ===

Staff Details:

Person ID	: D4468
Name	: Sarah Johnson
Address	: 123 Health Street
Phone Number	: 0167891234
Gender	: F
Age	: 35
Department	: Cardiology
Shift	: Evening
Experience	: 12

Staff Details:

Person ID	: D4470
Name	: Emma Williams
Address	: 234 Wellness Blvd
Phone Number	: 0162345678
Gender	: F
Age	: 38
Department	: Pediatrics
Shift	: Morning
Experience	: 10

Staff Details:

Person ID	: D4474
Name	: Liu Yang
Address	: 654 Health Park
Phone Number	: 0164567890
Gender	: F
Age	: 39
Department	: Ophthalmology
Shift	: Evening
Experience	: 14

Staff Details:

Person ID	: D4476
Name	: Sofia Martinez
Address	: 147 Clinic Way
Phone Number	: 0166543210
Gender	: F
Age	: 36
Department	: Endocrinology
Shift	: Morning
Experience	: 11

Press Enter to continue...

Explanation : If the user enters "3", the system will ask the user to select the **doctor's gender** needed to search. After entering, all the doctor' details of each doctor with that gender will be displayed in a

box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Doctors**)

3.8.2.4 Search Doctors (Search by Age Range)

The screenshot shows a terminal window with a dark background and light-colored text. It is divided into two main sections. The left section contains a menu titled '=== Search Doctors ===' with options: [1] Search by Name, [2] Search by Department, [3] Search by Gender, [4] Search by Age Range, [5] Search by Experience, [6] Search by Shift, and [0] Back. Below the menu, it says 'Choose search criteria: 4'. Then it asks 'Select age range:' with options: [1] Young (25-35), [2] Middle-aged (36-50), and [3] Senior (51+). The prompt 'Choice: ' is followed by a cursor. The right section is titled '=== Doctors aged 51-100 ===' and displays 'Staff Details:' for a doctor with the following attributes: Person ID : D4471, Name : Raj Patel, Address : 890 Hospital Lane, Phone Number : 0168765432, Gender : M, Age : 52, Department : Oncology, Shift : Morning, and Experience : 25. At the bottom of the right section, there is a box that says 'Press Enter to continue...'.

```
=== Search Doctors ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: 4

Select age range:
[1] Young (25-35)
[2] Middle-aged (36-50)
[3] Senior (51+)
Choice: █

=== Doctors aged 51-100 ===

Staff Details:
Person ID      : D4471
Name           : Raj Patel
Address        : 890 Hospital Lane
Phone Number   : 0168765432
Gender         : M
Age            : 52
Department     : Oncology
Shift          : Morning
Experience      : 25

Press Enter to continue...
```

Explanation : If the user enters "4", the system will ask the user to select the **doctor's age range** needed to search. After entering, all the doctor' details of each doctor within that age range will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Doctors**) .

3.8.2.5 Search Doctors (Search by Experience)

=== Search Doctors ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: 5

Select experience level:
[1] Junior (0-5 years)
[2] Intermediate (6-10 years)
[3] Senior (11+ years)
Choice:

=== Doctors with 11+ years of experience ===

Staff Details:

Person ID : D4467
Name : Zhang Wei
Address : 567 Care Road
Phone Number : 0165432109
Gender : M
Age : 41
Department : Orthopedics
Shift : Morning
Experience : 20

Staff Details:

Person ID : D4468
Name : Sarah Johnson
Address : 123 Health Street
Phone Number : 0167891234
Gender : F
Age : 35
Department : Cardiology
Shift : Evening
Experience : 12

Staff Details:

Person ID : D4476
Name : Sofia Martinez
Address : 147 Clinic Way
Phone Number : 0166543210
Gender : F
Age : 36
Department : Endocrinology
Shift : Morning
Experience : 11

Staff Details:

Person ID : D4477
Name : David Kim
Address : 258 Hospital Drive
Phone Number : 0165555555
Gender : M
Age : 42
Department : Rheumatology
Shift : Morning
Experience : 13

Press Enter to continue...

Explanation : If the user enters "5", the system will ask the user to select the **doctor's experience level** needed to search. After entering, all the doctor' details of each doctor within that

experience-level will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Doctors**) .

3.8.2.6 Search Doctors (Search by Shift)

=== Search Doctors ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: 6

Select shift:
[1] Morning
[2] Evening
Choice:

=== Doctors in Evening shift ===

Staff Details:
Person ID : D4468
Name : Sarah Johnson
Address : 123 Health Street
Phone Number : 0167891234
Gender : F
Age : 35
Department : Cardiology
Shift : Evening
Experience : 12

Staff Details:
Person ID : D4472
Name : Maria Garcia
Address : 456 Care Circle
Phone Number : 0163456789
Gender : F
Age : 33
Department : Dermatology
Shift : Evening
Experience : 8

Staff Details:
Person ID : D4474
Name : Liu Yang
Address : 654 Health Park
Phone Number : 0164567890
Gender : F
Age : 39
Department : Ophthalmology
Shift : Evening
Experience : 14

Press Enter to continue...

Explanation : If the user enters "6", the system will ask the user to select the **doctor's working shift** needed to search. After entering, all the doctor' details of each doctor within that shift will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Doctors**) .

3.8.3 Search Nurses

=== Search Nurses ===

- [1] Search by Name
- [2] Search by Department
- [3] Search by Gender
- [4] Search by Age Range
- [5] Search by Experience
- [6] Search by Shift
- [0] Back

Choose search criteria: █

Explanation : When the user enters "3" in the main page of the **Search and View Data**, it will go to the **Search Nurses** section. A menu of several search criteria which indicate data used for the search function for this section will be displayed. User is required to choose one search criteria.

3.8.3.1 Search Nurses (Search by Name)

=== Search Nurses ===

- [1] Search by Name
- [2] Search by Department
- [3] Search by Gender
- [4] Search by Age Range
- [5] Search by Experience
- [6] Search by Shift
- [0] Back

Choose search criteria: 1

Enter nurse name: █

=== Nurses named "David Kim" ===

ID	: N0011
Name	: David Kim
Address	: 258 Hospital Drive
Phone	: 0165555555
Gender	: M
Age	: 42
Department	: Rheumatology
Shift	: Morning
Experience	: 13 years

Press Enter to continue...

█

Explanation : If the user enters "1", the system will ask the user to enter the **nurse's name** needed to search. After entering, all the nurses' details of each nurse with that name will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Nurses**) .

3.8.3.2 Search Nurses (Search by Department)

The screenshot shows a terminal window with a dark background and light blue text. It is divided into two main sections. The left section displays a menu titled '=== Search Nurses ===' with options: [1] Search by Name, [2] Search by Department, [3] Search by Gender, [4] Search by Age Range, [5] Search by Experience, [6] Search by Shift, and [0] Back. Below this, it prompts 'Choose search criteria: 2' and 'Select department:' followed by a list of departments from [1] Cardiology to [10] Rheumatology. The user has entered 'Choice: 1'. The right section displays a box titled '=== Nurses in Department "Endocrinology" ===' containing the details of a nurse: ID : N0010, Name : Sofia Martinez, Address : 147 Clinic Way, Phone : 0166543210, Gender : F, Age : 36, Department : Endocrinology, Shift : Morning, and Experience : 11 years. Below this box is a prompt 'Press Enter to continue...'.

```
=== Search Nurses ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: 2

Select department:
[1] Cardiology
[2] Neurology
[3] Pediatrics
[4] Oncology
[5] Dermatology
[6] Gastroenterology
[7] Ophthalmology
[8] Pulmonology
[9] Endocrinology
[10] Rheumatology
Choice: 1

=== Nurses in Department "Endocrinology" ===

ID      : N0010
Name    : Sofia Martinez
Address : 147 Clinic Way
Phone   : 0166543210
Gender  : F
Age     : 36
Department : Endocrinology
Shift   : Morning
Experience : 11 years

Press Enter to continue...
```

Explanation : If the user enters "2", the system will ask the user to select the **nurse's department** needed to search. After entering, all the nurses' details of each nurse within that department will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to Search Nurses) .

3.8.3.3 Search Nurses (Search by Gender)

=== Search Nurses ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: 3

Select gender:

[1] Male (M)
[2] Female (F)

Choice: █

=== Nurses with Gender "M" ===

ID : N0003
Name : Michael Chen
Address : 789 Medical Ave
Phone : 0169876543
Gender : M
Age : 45
Department : Neurology
Shift : Morning
Experience : 20 years

ID : N0005
Name : Raj Patel
Address : 890 Hospital Lane
Phone : 0168765432
Gender : M
Age : 52
Department : Oncology
Shift : Morning
Experience : 25 years

ID : N0011
Name : David Kim
Address : 258 Hospital Drive
Phone : 0165555555
Gender : M
Age : 42
Department : Rheumatology
Shift : Morning
Experience : 13 years

ID : N9794
Name : GAYGAY
Address : main
Phone : 123
Gender : M
Age : 10
Department : AHA
Shift : nightNight
Experience : 5 years

Press Enter to continue...

Explanation : If the user enters "3", the system will ask the user to select the **nurse's gender** needed to search. After entering, all the nurses' details of each nurse within that gender will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Nurses**) .

3.8.3.4 Search Nurses (Search by Age Range)

The screenshot shows a terminal window with a dark background and light-colored text. On the left, a menu titled '=== Search Nurses ===' lists options: [1] Search by Name, [2] Search by Department, [3] Search by Gender, [4] Search by Age Range, [5] Search by Experience, [6] Search by Shift, and [0] Back. Below the menu, the user has entered '4' for 'Choose search criteria:' and is prompted to 'Select age range:'. The age range options are [1] Young (20-30), [2] Middle-aged (31-45), and [3] Senior (46+). The user's choice is shown as 'Choice: ' followed by a cursor. On the right, a box titled '=== Nurses aged 46-100 ===' displays the details of two nurses. The first nurse is Raj Patel (ID: N0005, Age: 52, Department: Oncology). The second nurse is James Wilson (ID: N0007, Age: 47, Department: Gastroenterology). At the bottom right, a box prompts the user to 'Press Enter to continue...'.

```
=== Search Nurses ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: 4

Select age range:
[1] Young (20-30)
[2] Middle-aged (31-45)
[3] Senior (46+)
Choice: 

=== Nurses aged 46-100 ===

ID      : N0005
Name    : Raj Patel
Address : 890 Hospital Lane
Phone   : 0168765432
Gender  : M
Age     : 52
Department : Oncology
Shift   : Morning
Experience : 25 years

ID      : N0007
Name    : James Wilson
Address : 321 Doctor Road
Phone   : 0167654321
Gender  : M
Age     : 47
Department : Gastroenterology
Shift   : Morning
Experience : 18 years

Press Enter to continue...
```

Explanation : If the user enters "4", the system will ask the user to select the **nurse's age range** needed to search. After entering, all the nurses' details of each nurse within that age range will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to Search Nurses) .

3.8.3.5 Search Nurses (Search by Experience)

=== Search Nurses ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: 5

Select experience level:
[1] Junior (0-3 years)
[2] Intermediate (4-7 years)
[3] Senior (8+ years)
Choice:

=== Nurses with 0+ years of experience ===

ID : N0002
Name : Sarah Johnson
Address : 123 Health Street
Phone : 0167891234
Gender : F
Age : 35
Department : Cardiology
Shift : Evening
Experience : 10 years

ID : N0003
Name : Michael Chen
Address : 789 Medical Ave
Phone : 0169876543
Gender : M
Age : 45
Department : Neurology
Shift : Morning
Experience : 20 years

ID : N9794
Name : GAYGAY
Address : main
Phone : 123
Gender : M
Age : 10
Department : AHA
Shift : nightNight
Experience : 5 years

Press Enter to continue...

Explanation : If the user enters "5", the system will ask the user to select the **nurse's experience level** needed to search. After entering, all the nurses' details of each nurse within that experience level will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Nurses**) .

3.8.3.6 Search Nurses (Search by Shift)

=== Search Nurses ===

[1] Search by Name
[2] Search by Department
[3] Search by Gender
[4] Search by Age Range
[5] Search by Experience
[6] Search by Shift
[0] Back

Choose search criteria: 6

Select shift:

[1] Morning
[2] Evening
[3] Night

Choice: █

=== Nurses in Evening shift ===

ID : N0002
Name : Sarah Johnson
Address : 123 Health Street
Phone : 0167891234
Gender : F
Age : 35
Department : Cardiology
Shift : Evening
Experience : 10 years

ID : N0006
Name : Maria Garcia
Address : 456 Care Circle
Phone : 0163456789
Gender : F
Age : 33
Department : Dermatology
Shift : Evening
Experience : 8 years

ID : N0008
Name : Liu Yang
Address : 654 Health Park
Phone : 0164567890
Gender : F
Age : 39
Department : Ophthalmology
Shift : Evening
Experience : 14 years

ID : N0009
Name : Ahmed Hassan
Address : 987 Medical Court
Phone : 0169998877
Gender : M
Age : 44
Department : Pulmonology
Shift : Evening
Experience : 16 years

Press Enter to continue...

█

Explanation : If the user enters "6", the system will ask the user to select the **nurse's working shift** needed to search. After entering, all the nurses' details of each nurse within that shift will be displayed in a box. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Nurses**) .

3.8.4 Search Appointments

```

=== Search Appointments ===

[1] Search by status
[2] Search by date
[0] Back

Choose search criteria: 

```

```

=== Search Appointments ===

[1] Search by status
[2] Search by date
[0] Back

Choose search criteria: 1

Select appointment status:
[1] Active
[2] Scheduled
Choice: 

```

```

=== Search Appointments ===

[1] Search by status
[2] Search by date
[0] Back

Choose search criteria: 2

Select date range:
[1] Today
[2] This Week
[3] This Month
Choice: 

```

Explanation :

When the user enters "4" in the main page of the **Search and View Data**, it will go to the **Search Appointment** section. A menu of several search criteria which indicate data used for the search function for this section will be displayed. User is required to choose one search criteria.

If the user enters "1", the system will ask the user to select the **appointment's status** needed to search.

If the user enters "2", the system will ask the user to select the **appointment's date range** needed to search.

3.8.4.1 Search Appointments (Search by status)

```

=== Appointments with Status "Active" ===

```

Appointment ID	Date & Time	Status	Doctor	Room
A7227	22/03/2025 11:15	Active	P8541	D9752
A7229	28/03/2025 10:45	Active	P8543	D9754
A7231	18/04/2025 13:45	Active	P8545	D9756
A7233	02/05/2025 10:15	Active	P8547	D9758
A7235	10/05/2025 14:00	Active	P8549	D9760

```

Press Enter to continue...

```

=== Appointments with Status "Scheduled" ===

Appointment ID	Date & Time	Status	Doctor	Room
A7225	18/03/2025 09:00	Scheduled	P8539	D9750
A7226	20/03/2025 14:30	Scheduled	P8540	D9751
A7228	25/03/2025 16:00	Scheduled	P8542	D9753
A7230	15/04/2025 09:30	Scheduled	P8544	D9755
A7232	22/04/2025 11:00	Scheduled	P8546	D9757
A7234	05/05/2025 15:30	Scheduled	P8548	D9759

Press Enter to continue...

Explanation : After entering, all the appointments and its details with that status will be displayed in a table. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Appointment**) .

3.8.4.2 Search Appointments (Search by date)

=== Appointments for Today ===

Appointment ID	Date & Time	Status	Doctor	Room
No appointments found in the specified date range.				

Press Enter to continue...

=== Appointments for This Week ===

Appointment ID	Date & Time	Status	Doctor	Room
No appointments found in the specified date range.				

Press Enter to continue...

=== Appointments for This Month ===

Appointment ID	Date & Time	Status	Doctor	Room
A7233	02/05/2025 10:15	Active	P8547	D9758
A7234	05/05/2025 15:30	Scheduled	P8548	D9759
A7235	10/05/2025 14:00	Active	P8549	D9760

Press Enter to continue...

Explanation : After entering, all the appointments and its details within that date range will be displayed in a table. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Appointment**) .

3.8.5 Search Rooms

<pre>=== Search Rooms === [1] Search by room type [2] Search by status [0] Back Choose search criteria: █</pre>	
<pre>=== Search Rooms === [1] Search by room type [2] Search by status [0] Back Choose search criteria: 1 Select room type: [1] ICU [2] Ward [3] Emergency [4] Operation [5] Isolation Choice: █</pre>	<pre>=== Search Rooms === [1] Search by room type [2] Search by status [0] Back Choose search criteria: 2 Select status: [1] Available [2] Occupied Choice: █</pre>

Explanation :

When the user enters "5" in the main page of the **Search and View Data**, it will go to the **Search Room** section. A menu of several search criteria which indicate data used for the search function for this section will be displayed. User is required to choose one search criteria.

If the user enters "1", the system will ask the user to select the **room type** needed to search.

If the user enters "2", the system will ask the user to select the **room status** needed to search.

3.8.5.1 Search Rooms (Search by room type)

```
=== Rooms of Type "ICU" ===

=== Search Rooms By Type ===

+-----+ +-----+ +-----+
| R72[Available] | | R54[Available] | | R47[Available] |
| Type: ICU      | | Type: ICU      | | Type: ICU      |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R77[ Occupied] | | R45[Available] | | R13[Available] |
| Type: ICU      | | Type: ICU      | | Type: ICU      |
+-----+ +-----+ +-----+

+-----+ +-----+
| R57[Available] | | R81[Available] |
| Type: ICU      | | Type: ICU      |
+-----+ +-----+

Total number of rooms of type ICU: 8

Press Enter to continue...
```

```
=== Rooms of Type "Ward" ===

=== Search Rooms By Type ===

+-----+ +-----+ +-----+
| R40[ Occupied] | | R63[ Occupied] | | R78[Available] |
| Type: Ward     | | Type: Ward     | | Type: Ward     |
+-----+ +-----+ +-----+

Total number of rooms of type Ward: 3

Press Enter to continue...
```



```
=== Rooms of Type "Emergency" ===

=== Search Rooms By Type ===

+-----+ +-----+ +-----+
| R26[Available] | | R94[Available] | | R92[Available] |
| Type: Emergency | | Type: Emergency | | Type: Emergency |
+-----+ +-----+ +-----+

+-----+
| R12[Available] |
| Type: Emergency |
+-----+

Total number of rooms of type Emergency: 4

Press Enter to continue...
```

```
=== Rooms of Type "Operation" ===

=== Search Rooms By Type ===

+-----+ +-----+
| R20[ Occupied] | | R91[ Occupied] |
| Type: Operation | | Type: Operation |
+-----+ +-----+

Total number of rooms of type Operation: 2

Press Enter to continue...
```

```
=== Rooms of Type "Isolation" ===

=== Search Rooms By Type ===

+-----+
| R75[ Occupied] |
| Type: Isolation |
+-----+

Total number of rooms of type Isolation: 1

Press Enter to continue...
```

Explanation : After entering, each room with that room type will be displayed in a box with its room type. A total number of rooms for that room type will also be displayed. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Rooms**) .

3.8.5.2 Search Rooms (Search by status)

```

=== Rooms with Status "Available" ===

=== Search Rooms By Status ===

+-----+ +-----+ +-----+
| R72[Available] | | R54[Available] | | R47[Available] |
| Type: ICU      | | Type: ICU      | | Type: ICU      |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R45[Available] | | R13[Available] | | R57[Available] |
| Type: ICU      | | Type: ICU      | | Type: ICU      |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R81[Available] | | R26[Available] | | R94[Available] |
| Type: ICU      | | Type: Emergency | | Type: Emergency |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R92[Available] | | R78[Available] | | R12[Available] |
| Type: Emergency | | Type: Ward      | | Type: Emergency |
+-----+ +-----+ +-----+

Total number of rooms with status Available: 12

Press Enter to continue...

```

```

=== Rooms with Status "Occupied" ===

=== Search Rooms By Status ===

+-----+ +-----+ +-----+
| R77[ Occupied] | | R75[ Occupied] | | R40[ Occupied] |
| Type: ICU      | | Type: Isolation | | Type: Ward      |
+-----+ +-----+ +-----+

+-----+ +-----+ +-----+
| R63[ Occupied] | | R20[ Occupied] | | R91[ Occupied] |
| Type: Ward      | | Type: Operation | | Type: Operation |
+-----+ +-----+ +-----+

Total number of rooms with status Occupied: 6

Press Enter to continue...

```

Explanation : After entering, each room with that status will be displayed in a box with its room type. A total number of rooms for that status will also be displayed. Once finished viewing, the user is prompted to press Enter to continue (back to **Search Rooms**) .

3.8.6 Back to Main Menu

Search/View Data	
Option	Description
1	Search Patients
2	Search Doctors
3	Search Nurses
4	Search Appointments
5	Search Rooms
0	Back to Main Menu

Choose an option (0 to return to main menu):

Note : Full page image can refer back to the image in 3.8

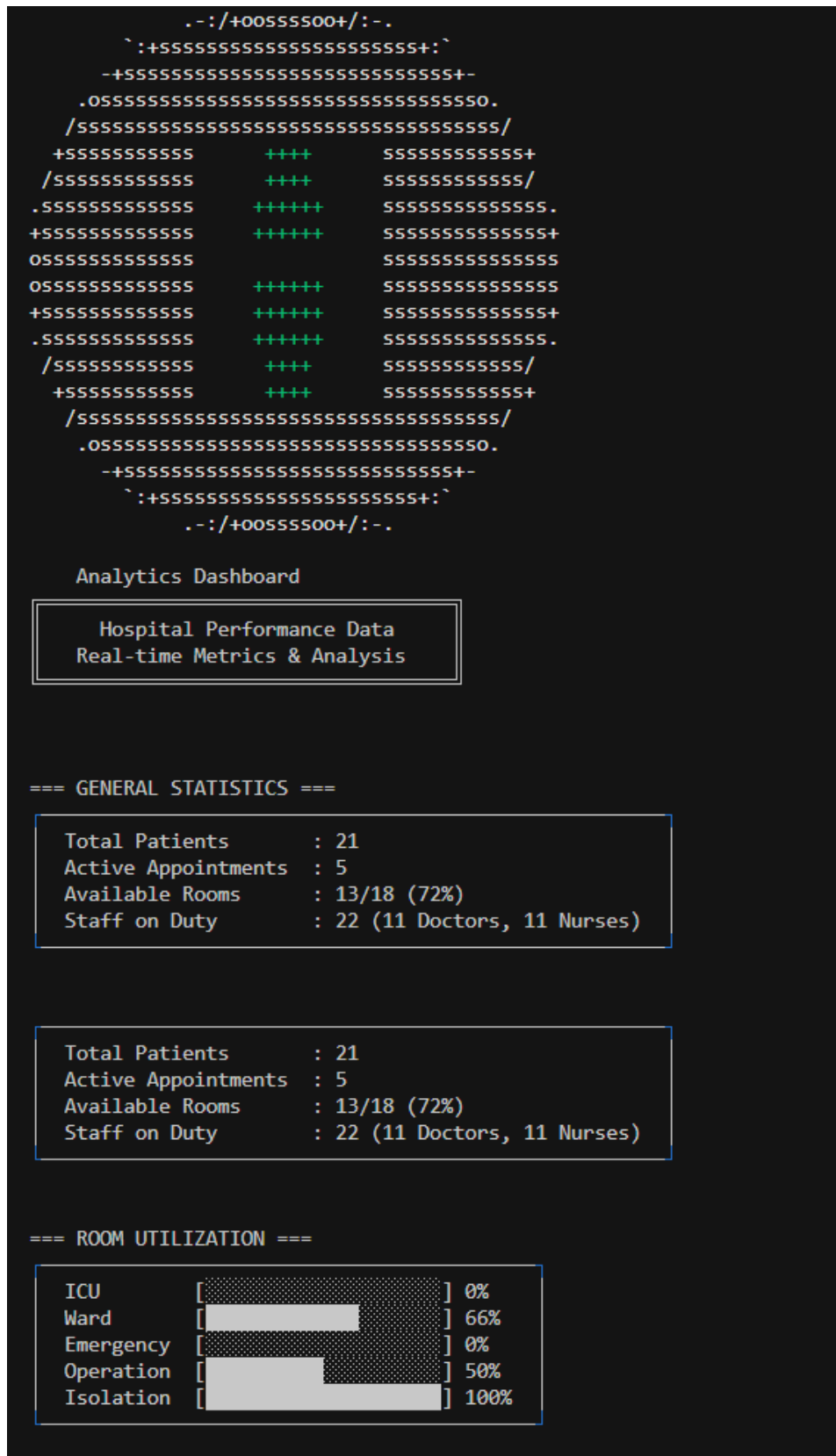
Main Menu	
Option	Description
1	Manage Rooms
2	Manage Patients
3	Manage Doctors
4	Manage Nurses
5	Manage Appointments
6	Manage Medical Records
7	Search/View Data
8	Analytics Dashboard
9	Change Password
0	Exit

Choose an option:

Note : Full page image can refer back to the image in 3.1.2

Explanation : Entering "0" in the **Search and View Data** will lead the user back to the **Main Menu**.

3.9 Analytic Dashboards





Explanation :

After entering "8" in the **Main Menu**, the user will go to the **Analytic Dashboard** section. A **general statistics** for each part of the hospital management system will be displayed in a box. **Room utilization**, **patient age distribution**, **gender distribution** and the **appointment trends** will be displayed by using the horizontal bar chart format. There is also a message showing the peak appointment periods.

Once finished viewing, the user is required to press Enter to continue (back to the **Main Menu**) .

3.10.1 Change Password (After changing a new password)

```
Choose an option: 9
Enter current password: admin
Enter new password: admin1234
Password changed successfully!
```

```
Please log in again to continue.
```

Explanation :

After entering "9" in the **Main Menu**, the user will go to the **Change Password** section. The user is required to enter the current password for confirmation before changing the password. Once confirmed, the user is required to enter the new password.

A message "Password changed successfully!" will be displayed once the change is completed and the user is prompted to press Enter to log in again to continue (back to the login page).

4.0 Conclusion

The Hospital Management System (HMS) stands as a fully integrated, end-to-end solution for modern hospital administration. By unifying patient management, staff coordination, resource allocation, appointment scheduling, and medical-record keeping within a single, modular platform, the HMS ensures that every operational aspect is both streamlined and data-driven. Its robust validation, persistent storage, and comprehensive audit trails guarantee data integrity and regulatory compliance, while advanced analytics and real-time dashboards empower administrators to make proactive, evidence-based decisions.

The system's flexibility allows for seamless adaptation to changing healthcare demands, whether scaling to accommodate more patients, integrating new personnel, and responding to constant updates. Role-based access controls and secure authentication safeguard sensitive information, ensuring that users interact only with the data and functions relevant to their responsibilities. The HMS's extensible architecture supports future enhancements, such as integration with external health information systems or the addition of new modules for laboratory, pharmacy, or billing management.

Ultimately, the HMS not only reduces administrative overhead and operational bottlenecks but also enhances the quality and safety of patient care. By providing instant access to critical information, automating routine workflows, and delivering actionable insights through comprehensive analytics, the system enables hospitals to operate at peak efficiency. This positions healthcare institutions to respond rapidly to emergencies, optimize resource utilization, and continuously improve service delivery—ensuring that both clinical and administrative teams are equipped to meet the evolving challenges of the healthcare landscape.

5.0 References

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