AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)

Dept. of Computer Science
Faculty of Science and Technology

CSC2210: OBJECT ORIENTED PROGRAMMING 2

Summer 2023-2024

Section: E

Group No:10

Project Report On

Title: Hotel Booking & Management System.

Supervised By

Shaikat Das Joy

Submitted By:

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Obtained Marks for CO2 and CO3 (Description given in the following page)

Assessment Criteria	Not Attended/ Incorrect (0)	Inadequate (1-2)	Average (3)	Good (4)	Excellent (5)

Evaluation Criteria (CO2)	Total =	Evaluation Criteria (CO3)	Total =
Requirement fulfillment		Organization of the application	
Validation		Representation and Integration of Database	
Verification		Graphical User Interface	

CO2: Display and verify the mean of a real-life Project using the concepts of C# Graphical User Interface based environment with database integration to depict a desktop-based application.					
Assessment Criteria	**Not Attended/ Incorrect (0)**	**Inadequate (1-2)**	**Average (3)**	**Good (4)**	**Excellent (5)**
Evaluation Criteria	**Evaluation Definition**				
Requirement fulfillment	Fails to demonstrate any understanding of real-life scenario-based project development or functional requirement identification. There is no attempt to depict a project or identify functional requirements accurately.	Demonstrates limited understanding of real-life scenario-based project development and functional requirement identification. The project depicted lacks coherence or relevance to real-life scenarios, and functional requirements are inaccurately identified or insufficiently described.	Presents a basic depiction of a real-life scenario-based project and identifies some functional requirements. However, the project lacks depth or complexity, and some functional requirements may be vaguely defined or missing key details.	Effectively demonstrates a realistic scenario-based project and accurately identifies most functional requirements. The project is well-developed with appropriate complexity, and functional requirements are clearly articulated with relevant details.	Exhibits an exceptional understanding of real-life scenario-based project development and accurately identifies all functional requirements. The project is meticulously developed with thorough attention to detail, reflecting a comprehensive understanding of Object-Oriented Programming project development activities.
Validation	Fails to demonstrate any understanding or implementation of validation forms in their system. There is no attempt to deal with data validation, and validation requirements are completely ignored or incorrectly applied.	Demonstrates limited understanding of validation forms and data validation techniques. While some attempt may be made to implement validation, it is incomplete or poorly executed, leading to inadequate handling of data validation.	Shows a basic understanding of validation forms and data validation techniques. They attempt to implement validation, but some aspects may be missing or incorrectly implemented, resulting in partial or inconsistent handling of data validation.	Effectively demonstrates the use of validation forms and implements data validation techniques. Validation is mostly accurate and comprehensive, ensuring the proper handling of data input and verification in the system.	Exhibits an exceptional understanding and implementation of validation forms and data validation techniques. Validation is meticulously implemented with thorough attention to detail, ensuring robust data validation procedures and contributing to the overall reliability and integrity of the system.
Verification	Fails to demonstrate any attempt to verify the system data or functional requirements. There is no evidence of understanding or	Demonstrates limited understanding of verification processes and data flow in the system. Verification attempts are	Shows a basic understanding of verification processes and attempts to verify system data. However, verification efforts may be	Identifies and verifies system data, ensuring proper functional requirements are met. Verification efforts are mostly accurate and thorough, with	Exhibits an exceptional understanding of verification processes and meticulously verifies system data. Verification efforts are

	implementation of verification processes, and data flow is not considered.	incomplete or inaccurate, and there is insufficient consideration given to ensuring data integrity and functionality.	inconsistent or lack thoroughness, and there may be gaps in ensuring proper functional requirements and data flow.	attention to ensuring data integrity and appropriate data flow within the system.	comprehensive and precise, with a keen focus on ensuring all functional requirements are met and maintaining proper data flow throughout the system.

CO3: Prepare and Explain a real life desktop based application synthesizing several component of C# along with development tools to adhere the given requirements.

Assessment Criteria	Not Attended/ Incorrect (0)	Inadequate (1-2)	Average (3)	Good (4)	Excellent (5)
Evaluation Criteria	**Evaluation Definition**				
Organization of the application	Fails to identify any suitable real time application or requirements for project development activities related to OOP.	Limited understanding about the project scopes and scenarios or identification of functional requirements.	Lacks depth or relevance to OOP project development activities and may contain inaccuracies. Real-life scenarios are mentioned, but the discussion lacks depth or clarity.	Consider and integrate the idea of several core aspects of the project along with relevance to real-life scenarios. Demonstrating a solid understanding of the application presentation.	Generalize and exhibits an exceptional understanding of project preparation according to a to real-life scenarios. Also contains proper and insightful identification of the system which is comprehensive and precise.
Representation and Integration of Database	Fails to identify and present any understanding or implementation of database. Also failed to integrate the data with the project itself.	Limited understanding of the database concepts or their proper way of using in a real time project. While some attempt may be made to implement but it is incomplete or poorly executed, leading to inadequate design.	Lacks depth or relevance to database integration with the application. Shows a basic understanding but some aspects may be missing or incorrectly implemented, resulting in partial or inconsistency. May lack proper normalization.	Integrate the database with the forms properly and implements it with proper validation which is mostly accurate and comprehensive, ensuring the proper handling of data input and verification along with general normalization.	Exhibits an exceptional understanding and implementation of database ensuring attention to detail, and robust data manipulation procedures and contributing to the overall clarity.
Graphical User Interface	Fails to present or prepare GUI based application interfaces. There is no evidence of creating or integrating such things according to their usefulness.	Limited understanding of graphical user interfaces. Lack of design knowledge. Very poor attempt to make such things which are currently obsolete or can't be identified as coherent.	Shows a basic understanding of creating user interfaces. Most of them are interconnected but maybe some of them lack it. However, most of it can be described as user friendly.	Effectively identifies and meet the consider the simplicity. Design related works are mostly accurate and taken proper attention to ensuring a user-friendly coherent system.	Exhibits an exceptional work design following a high standard of simple and elegant work. Several controls and mechanism has been organized in a preferred way according to the coherent usage .

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Overview of the Project:

Our hotel management system is a desktop-based application designed to streamline and automate key hotel operations. The system manages essential data including guest reservations, room assignments, and staff responsibilities. It features modules for managing room availability, handling bookings, maintaining customer records, and tracking check-in and check-out activities. Integrated with manager, user, and room data, it provides an intuitive interface for staff to efficiently monitor hotel occupancy, enhance guest experiences, and ensure smooth day-to-day operations. This solution helps improve productivity and reduces manual errors, making hotel management more effective.

Goals of the System

- Automate hotel operations such as room booking, check-in/check-out, and information management.
- Provide hotel managers with administrative control to oversee the system's operations and handle critical tasks efficiently.
- Ensure secure access and management of sensitive data such as customer details.
- Improve hotel resource utilization by tracking room availability and optimizing booking processes.

Importance of Implementing This System in the Hotel Industry:
The Hotel Management System reduces operational inefficiencies and enhances customer satisfaction. It automates repetitive tasks like reservations and management, which helps hotel staff focus more on customer service. The system also minimizes errors in booking and data management, leading to better resource allocation and revenue optimization.

Architecture
The system is based on a desktop application architecture. It consists of a client-side interface used by hotel staff and an underlying database system that stores all relevant information. The architecture allows for centralized data storage, where all operations (room bookings, check-ins/check-outs, etc.) are reflected instantly. The manager module is designed to provide higher access control for administrative tasks.
Room Management:

Efficiently managing room availability based on specific date ranges, room types, and features is a cornerstone of our hotel management system. It enables hassle-free room booking for customers while allowing real-time monitoring of room status (Booked or Available). The system ensures that reservations are processed accurately, taking into account customer preferences such as room type and amenities, while also preventing double bookings. By offering real-time updates on room availability, it helps hotel staff manage reservations seamlessly, optimize room occupancy, and enhance guest satisfaction.

Customer Management:

Seamless check-in and check-out processes are facilitated and complemented by customer profile management. Essential customer details such as names, contact information, preferences, and other personalized information are stored and easily accessible to enhance their overall experience.

Entity-Relationship (ER) Diagram

The ER diagram represents the relationships between key entities in the system: Manager Data, Room Data, and User Data.

- **Manager Data** includes information on hotel managers, their roles, and their access privileges.
- **Room Data** tracks the status, type, and availability of rooms in the hotel.
- **User Data** refers to guest information, booking details, and transaction histories.

Database Design

The database consists of several tables with defined relationships:

- **Managers Table**: Stores manager login credentials, roles, and permissions.
- **Rooms Table**: Contains details about each room, including room number, type (single, double, suite), pricing, and availability status.
- **Bookings Table**: Maintains records of guest bookings, linked to both rooms and information.

Technologies Used

- **Programming Language**: The system is developed using programming language C# for building the desktop application.
- **Database**: MySQL is used for handling the database backend, providing a relational database management system to store and retrieve hotel data.
- **Development Environment**: The project is developed using integrated development environments (IDEs) Visual Studio, allowing for efficient coding and debugging.

Manager Module

The manager module provides administrative control to oversee hotel operations. Managers can:

- Add or modify room details.
- Generate reports on hotel occupancy and bookings.
- Manage staff access and roles.

Room Module

The room module manages all information related to hotel rooms:

- Room availability, pricing, and details (single, double, suite, etc.).
- The system allows for updating room status (booked, available, under maintenance).

User Module

The user module handles guest-related tasks:

- Records customer information and booking preferences.
- Facilitates the check-in and check-out process.

User Interface

The system interface is designed to be intuitive for all users. Screenshots for the following key interfaces can be included:

- **Booking Page**: A page that shows available rooms, pricing, and booking options.
- **Check-in/Check-out Page**: Displays guest details and booking information during check-in or check-out processes.
- **Admin Dashboard**: Accessible only by managers, this dashboard includes advanced features like reports and room status updates.

Testing

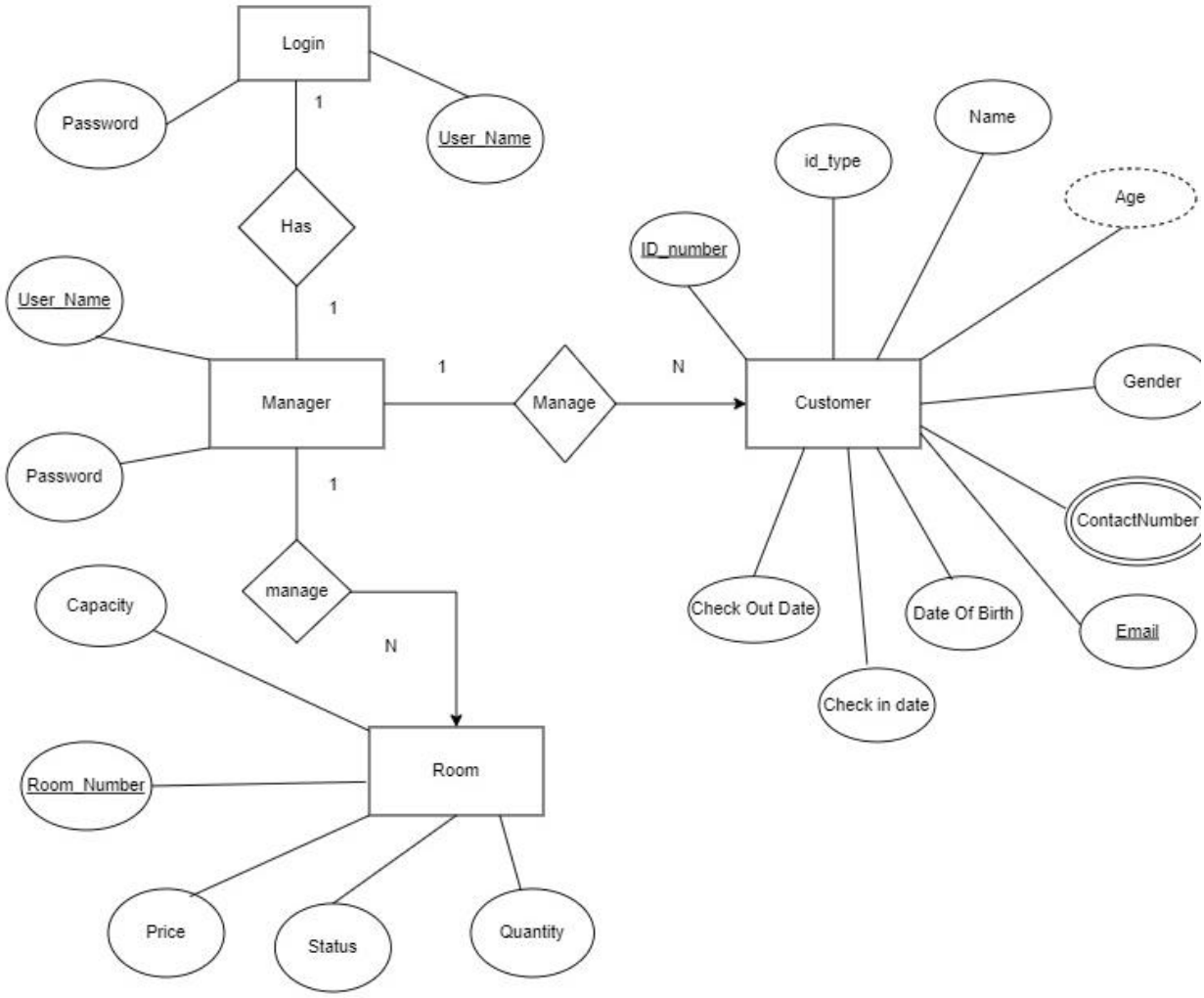
- **Unit Testing**: Each module is tested independently to ensure correct functionality.
- **Integration Testing**: The interaction between different modules (e.g., room and user modules) is tested to ensure seamless communication.
- **System Testing**: The entire system is tested in a simulated environment to check for bugs or glitches.
- **Testing Outcomes**: The system was rigorously tested, and any bugs identified were promptly resolved, ensuring smooth operation.

Conclusion

The Hotel Management System successfully automates hotel operations, making room bookings, check-ins, and check-outs efficient and error-free. The system enhances guest experiences by ensuring data accuracy and availability. It also benefits hotel managers by providing better control over operations and reporting. The system's user-friendly design and secure framework make it a valuable addition to any hotel.

User Stories:

Use Case	Actor	User Story
Log In	**Manager**	**The system allows managers to access it by logging in with their respective usernames and passwords.**
Check Room	**Manager**	**Manager check room availability.**
Request Room	**Customer**	**The customer requests a room.**
Update Data	**Manager**	**The manager can update their personal information.**
Book Room	**Manager**	**Managers are responsible for approving room requests.**
Manage Customer Details	**Manager**	**Managers can search customer data.**
Request services	**Manager**	**When a customer requires a service such as food or maintenance, they can request it accordingly.**
Manage Room	**Manager**	**The manager has the authority to add rooms to the hotel's inventory, delete existing rooms, and modify the room prices as needed.**
Manage User	**Manager**	**The manager oversees the login credentials and salaries of both the housekeepers and receptionists. They have the capability to update the passwords for existing users and delete their data when necessary.**
Housekeeper Details	**Manager**	**The manager has the ability to view the current details of housekeepers and can also delete housekeeper data when necessary.**
Receptionist Details	**Manager**	**The manager has the ability to view the current details of receptionists and can also delete receptionists' data when necessary.**



Data Dictionary:

Login:

Key	Name	Data Type	Length	Nullable
Primary	**UserName**	**nvarchar**	**50**	**NO**
	Password	**nvarchar**	**50**	**NO**

Clint:

Key	Name	Data Type	Length	Nullable
	Name	**nvarchar**	**50**	**NO**
	Gender	**nvarchar**	**50**	**NO**
	Email	**nvarchar**	**50**	**NO**
	Contact	**nvarchar**	**50**	**NO**
	ID_Type	**nvarchar**	**50**	**NO**
	ID_NO	**nvarchar**	**50**	**NO**
	DOB	**nvarchar**	**50**	**NO**
	Age	**nvarchar**	**50**	**NO**
	Address	**nvarchar**	**50**	**NO**
	Check_In_Date	**nvarchar**	**50**	**NO**
	Check_Out_Date	**nvarchar**	**50**	**NO**
Foreign Key	**Room_No**	**nvarchar**	**50**	**NO**

Room:

Key	Name	Data Type	Length	Nullable
Primary	**Room_Number**	**INT**		**NO**
	Name	**nvarchar**	**50**	**NO**
	capacity	**nvarchar**	**50**	**NO**
	Quality	**nvarchar**	**50**	**NO**
	Price	**Float**	**53**	**NO**
	Date	**nvarchar**	**50**	**NO**
	Status	**nvarchar**	**50**	**NO**

Query1(case sensitive password) = "SELECT COUNT(1) FROM login WHERE Username COLLATE SQL_Latin1_General_CP1_CS_AS = @Username AND Password COLLATE SQL_Latin1_General_CP1_CS_AS = @Password";

Query1(without case sensitive password) = "SELECT COUNT(1) FROM login WHERE Username=@Username AND Password=@Password";

Query2(checkUser) = SELECT COUNT(*) FROM Login WHERE Username = @Username

Query3(UPDATE Login SET Password) = @Password, Confirm_Password = @ConfirmPassword WHERE Username = @Username UPDATE Login SET Password = @Password, Confirm_Password = @ConfirmPassword WHERE Username = @Username

Query4(insert) = "INSERT INTO Room (RoomNumber, Name,) VALUES (@RoomNumber, @Name)"

Screenshots:

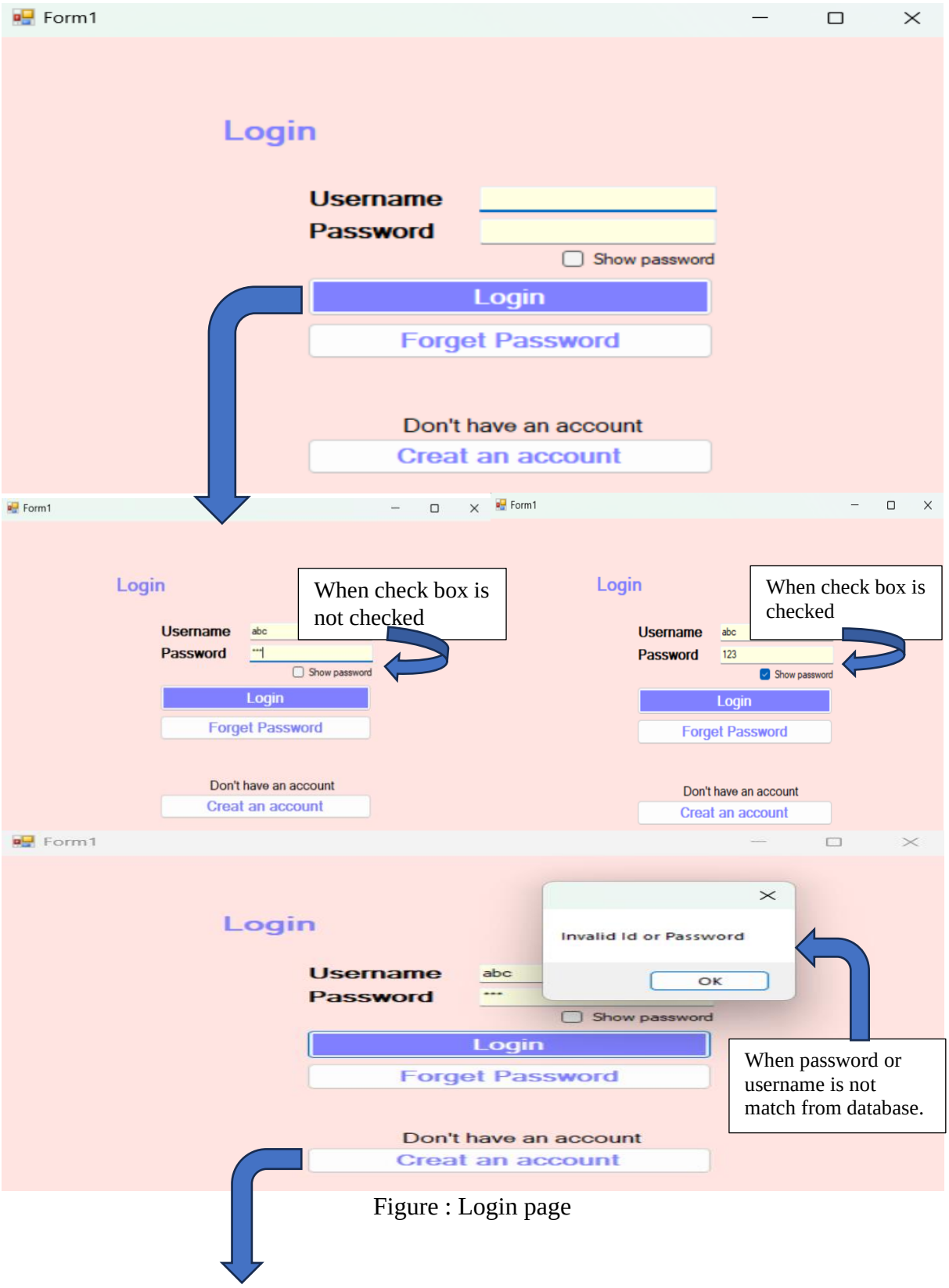


Figure : Login page

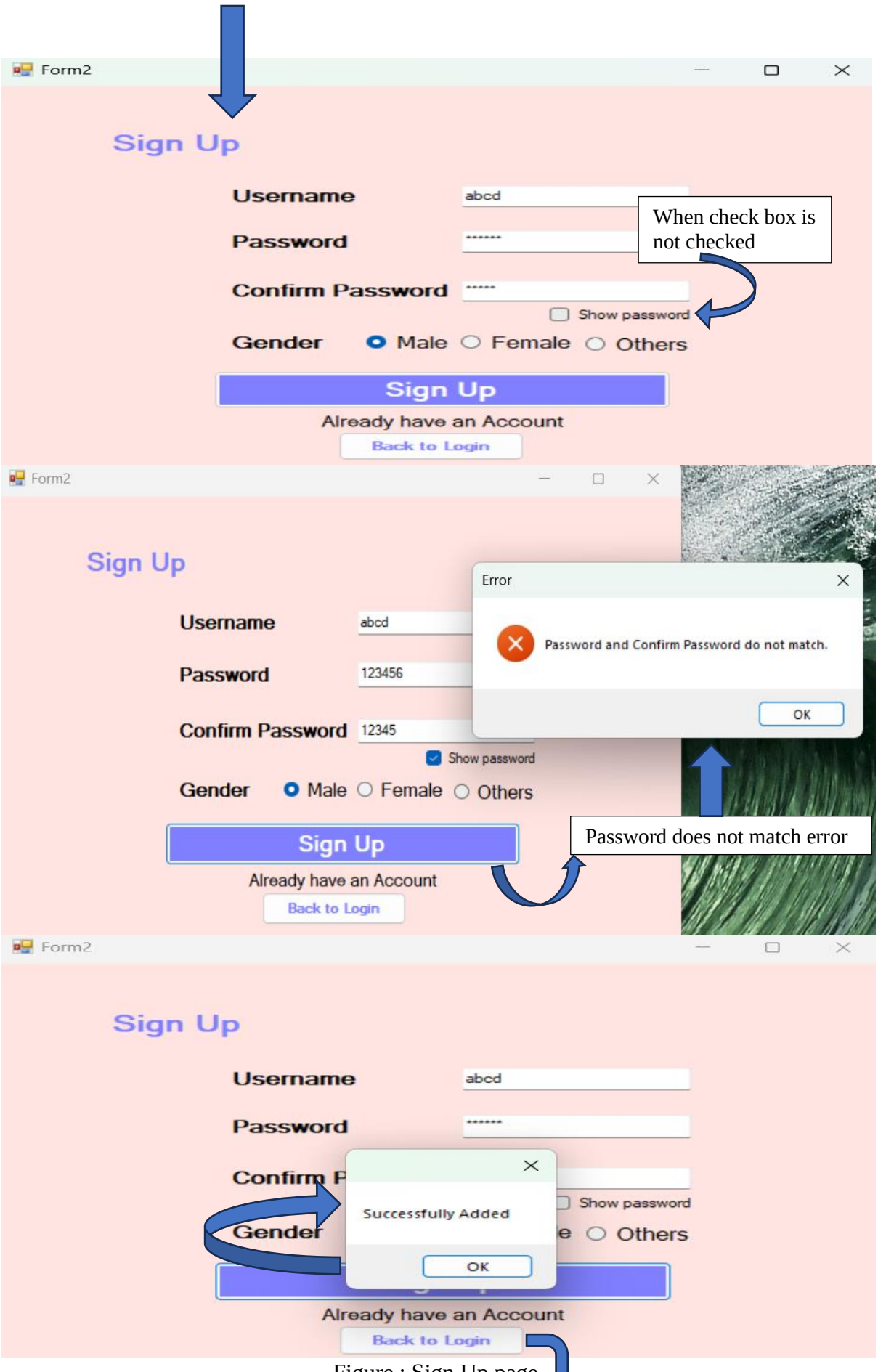


Figure : Sign Up page.

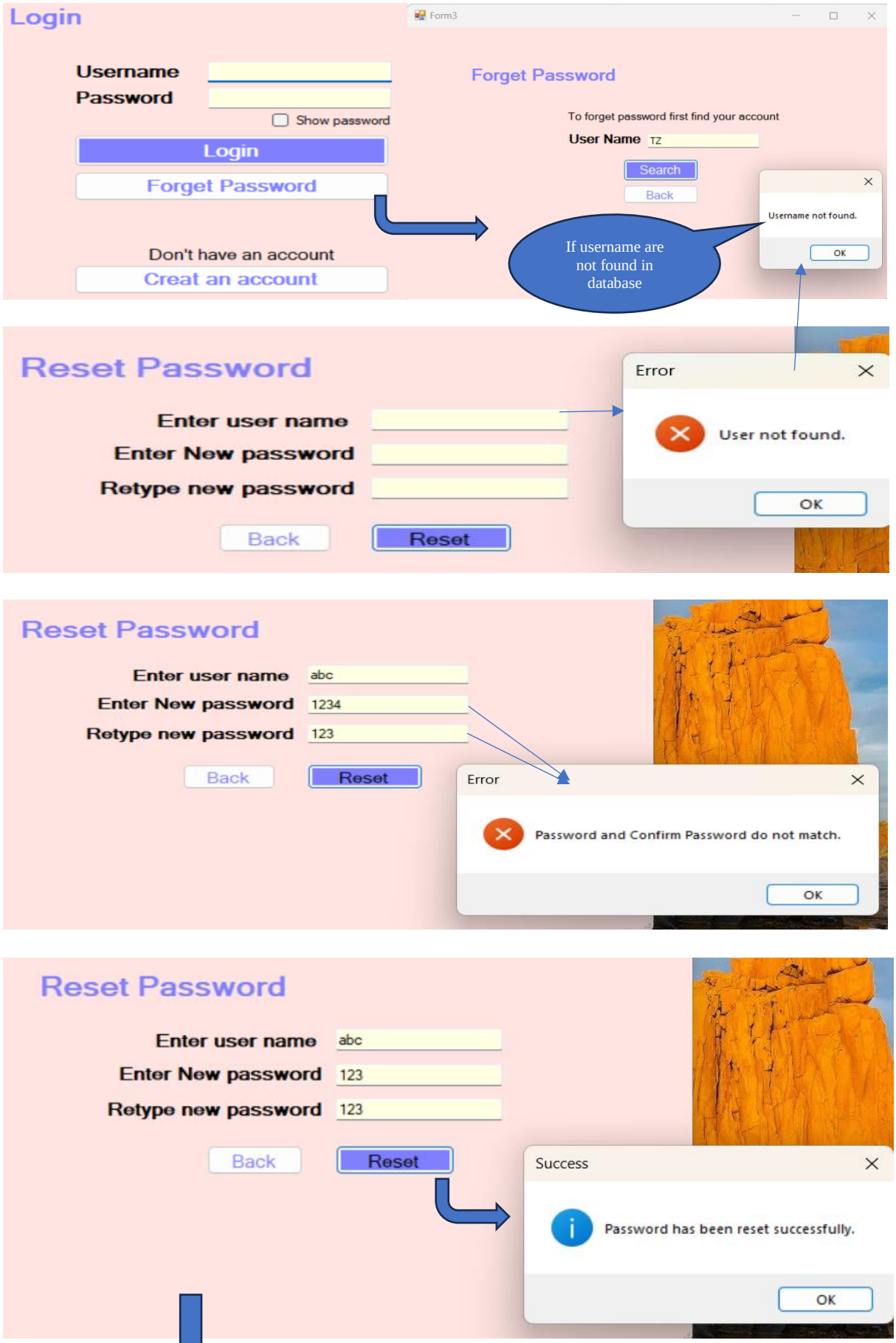
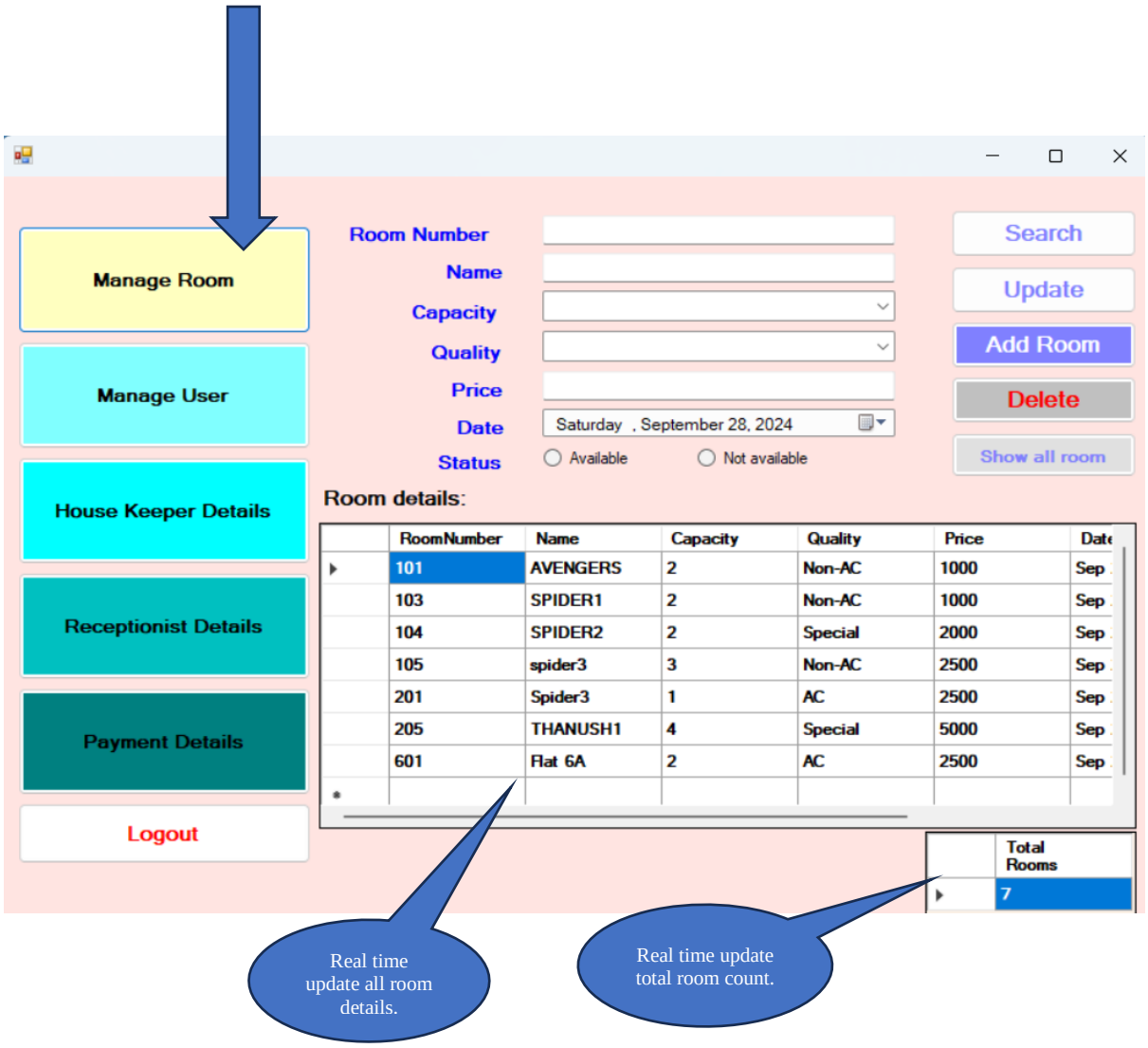
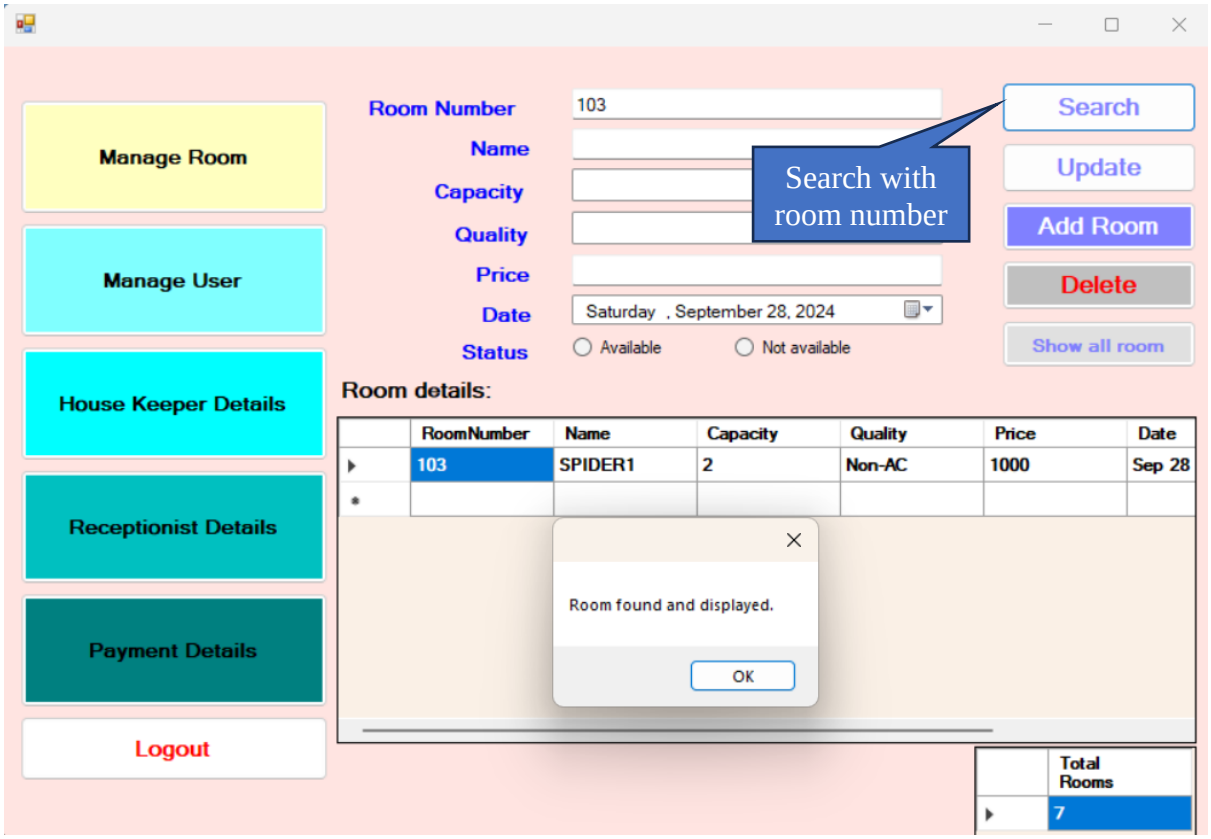
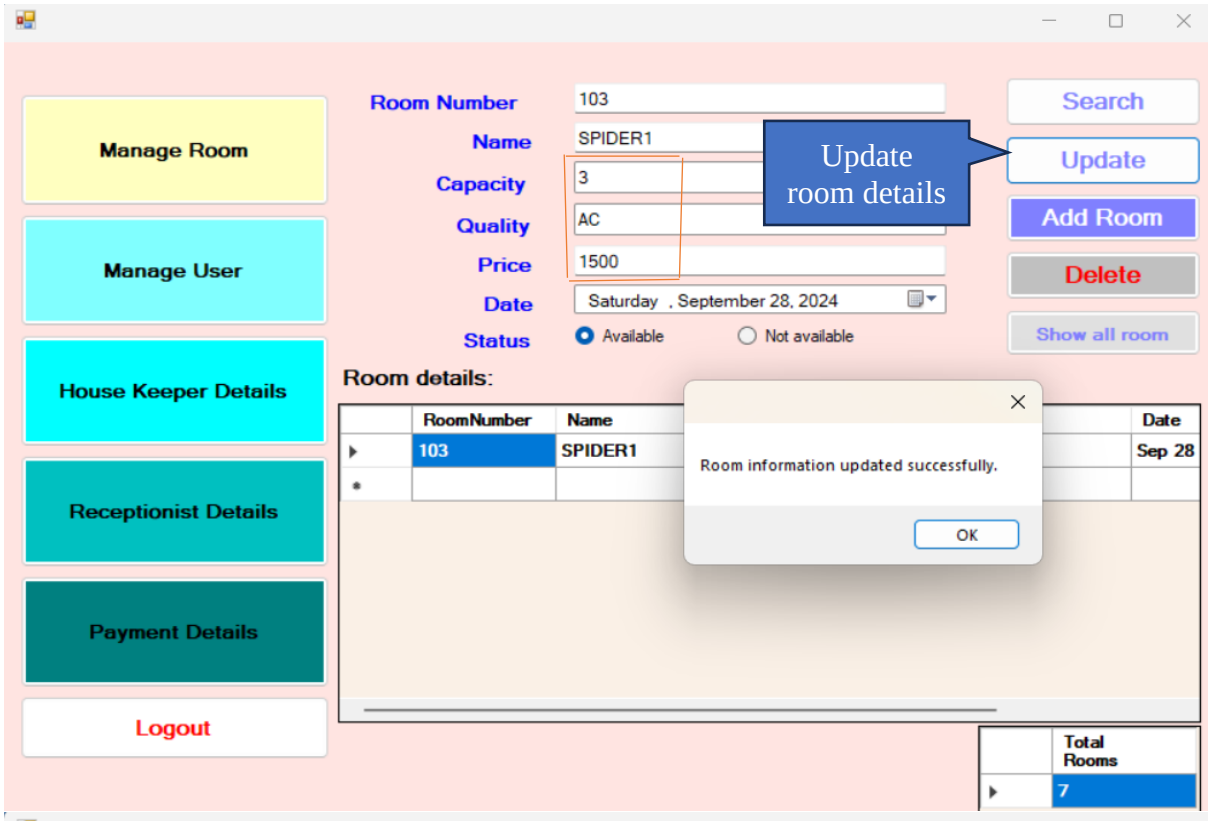
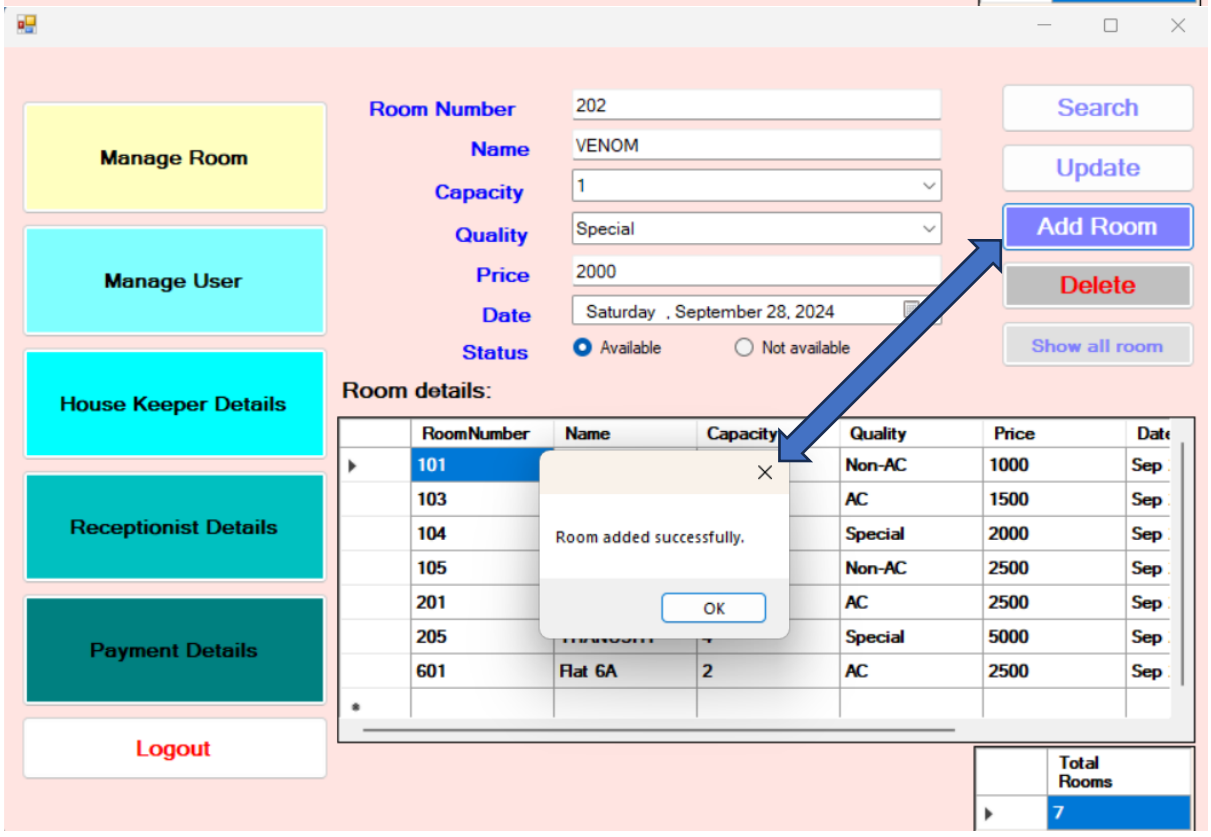


Figure : Forget password.

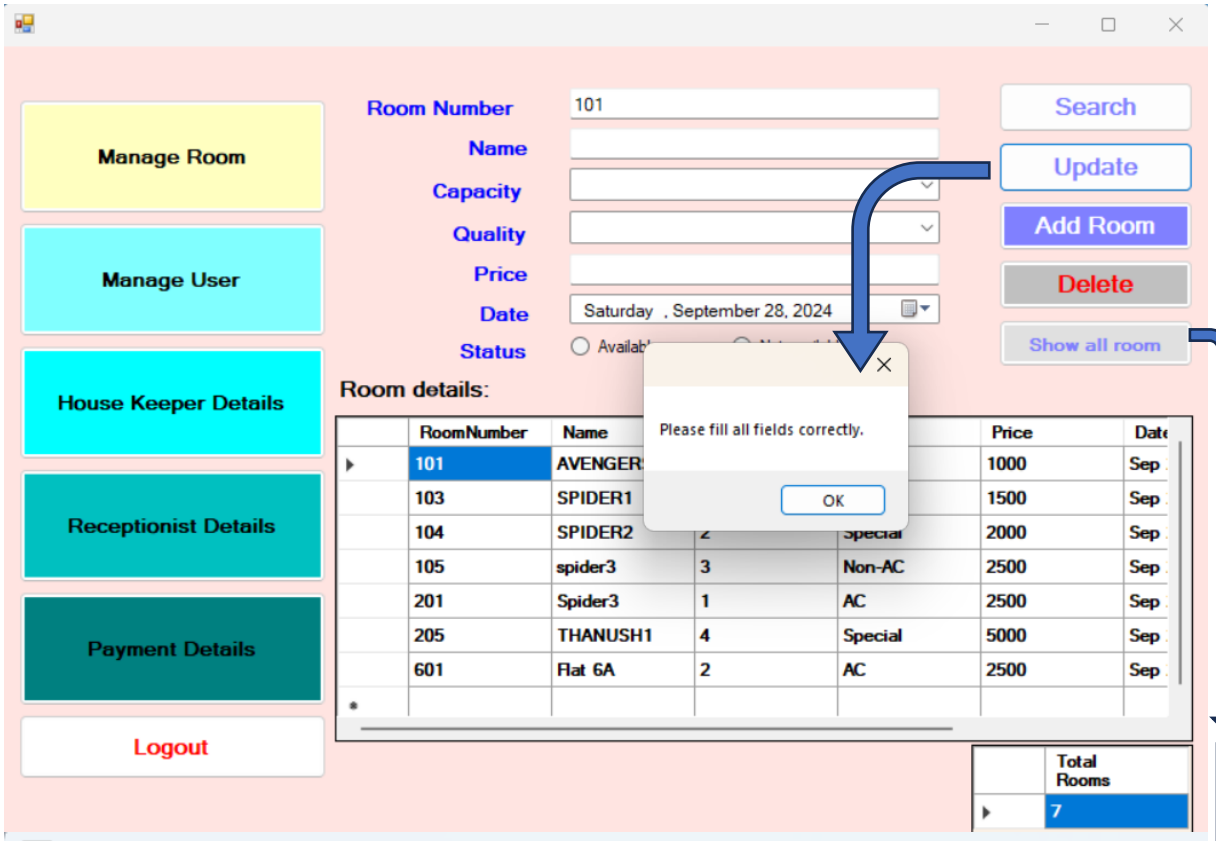

Manage Room
Manage User
House Keeper Details
Receptionist Details
Payment Details
Logout
Room Number
Name
Capacity
Quality
Price
Date
Saturday , September 28, 2024
Status
Available
Not available
Search
Update
Add Room
Delete
Show all room
Room details:
RoomNumber
Name
Capacity
Quality
Price
Date
101 AVENGERS 2 Non-AC 1000 Sep
103 SPIDER1 2 Non-AC 1000 Sep
104 SPIDER2 2 Special 2000 Sep
105 spider3 3 Non-AC 2500 Sep
201 Spider3 1 AC 2500 Sep
205 THANUSH1 4 Special 5000 Sep
601 Flat 6A 2 AC 2500 Sep
Total Rooms
7
Real time update all room details.
Real time update total room count.


Manage Room
Manage User
House Keeper Details
Receptionist Details
Payment Details
Logout
Room Number
103
Name
Capacity
Quality
Price
Date
Saturday , September 28, 2024
Status
Available
Not available
Search
Update
Add Room
Delete
Show all room
Search with room number
Room details:
RoomNumber
Name
Capacity
Quality
Price
Date
103 SPIDER1 2 Non-AC 1000 Sep 28
Room found and displayed.
OK
Total Rooms
7


Manage Room
Manage User
House Keeper Details
Receptionist Details
Payment Details
Logout
Room Number
Name
Capacity
Quality
Price
Date
Status
103
SPIDER1
3
AC
1500
Saturday , September 28, 2024
Available
Not available
Search
Update
Add Room
Delete
Show all room
Update room details
Room details:
RoomNumber
Name
Date
103
SPIDER1
Sep 28
Room information updated successfully.
OK
Total Rooms
7


Manage Room
Manage User
House Keeper Details
Receptionist Details
Payment Details
Logout
Room Number
Name
Capacity
Quality
Price
Date
Status
202
VENOM
1
Special
2000
Saturday , September 28, 2024
Available
Not available
Search
Update
Add Room
Delete
Show all room
Room details:
RoomNumber
Name
Capacity
Quality
Price
101
Non-AC
1000
103
AC
1500
104
Special
2000
105
Non-AC
2500
201
AC
2500
205
Special
5000
601
Flat 6A
2
AC
2500
Room added successfully.
OK
Total Rooms
7


Manage Room
Manage User
House Keeper Details
Receptionist Details
Payment Details
Logout
Room Number
Name
Capacity
Quality
Price
Date
Saturday , September 28, 2024
Search
Update
Add Room
Delete
Show all room
Delete Room
Are you sure you want to delete Room Number: 202?
Yes
No
Room detail
Price
103 1500 Sep
104 2000 Sep
105 2500 Sep
201 Spider3 1 AC 2500 Sep
202 VENOM 1 Special 2000 Sep
205 THANUSH1 4 Special 5000 Sep
601 Flat 6A 2 AC 2500 Sep
Total Rooms
8
Manage Room
Manage User
House Keeper Details
Receptionist Details
Payment Details
Logout
Room Number
Name
Capacity
Quality
Price
Date
Status
Saturday , September 28, 2024
September 2024
Sun Mon Tue Wed Thu Fri Sat
Today: 9/28/2024
Search
Update
Add Room
Delete
Show all room
Room details:
RoomNumber
Price
101 1000 Sep
103 1500 Sep
104 2000 Sep
105 spider3 3 Non-AC 2500 Sep
201 Spider3 1 AC 2500 Sep
205 THANUSH1 4 Special 5000 Sep
601 Flat 6A 2 AC 2500 Sep
Total Rooms
7
After remove room total number will be updated


Manage Room
Manage User
House Keeper Details
Receptionist Details
Payment Details
Logout
Room Number
101
Name
Capacity
Quality
Price
Date
Saturday , September 28, 2024
Status
Search
Update
Add Room
Delete
Show all room
Room details:
Please fill all fields correctly.
OK
RoomNumber
Name
Price
101
AVENGER
1000
103
SPIDER1
1500
104
SPIDER2
2000
105
spider3
3
Non-AC
2500
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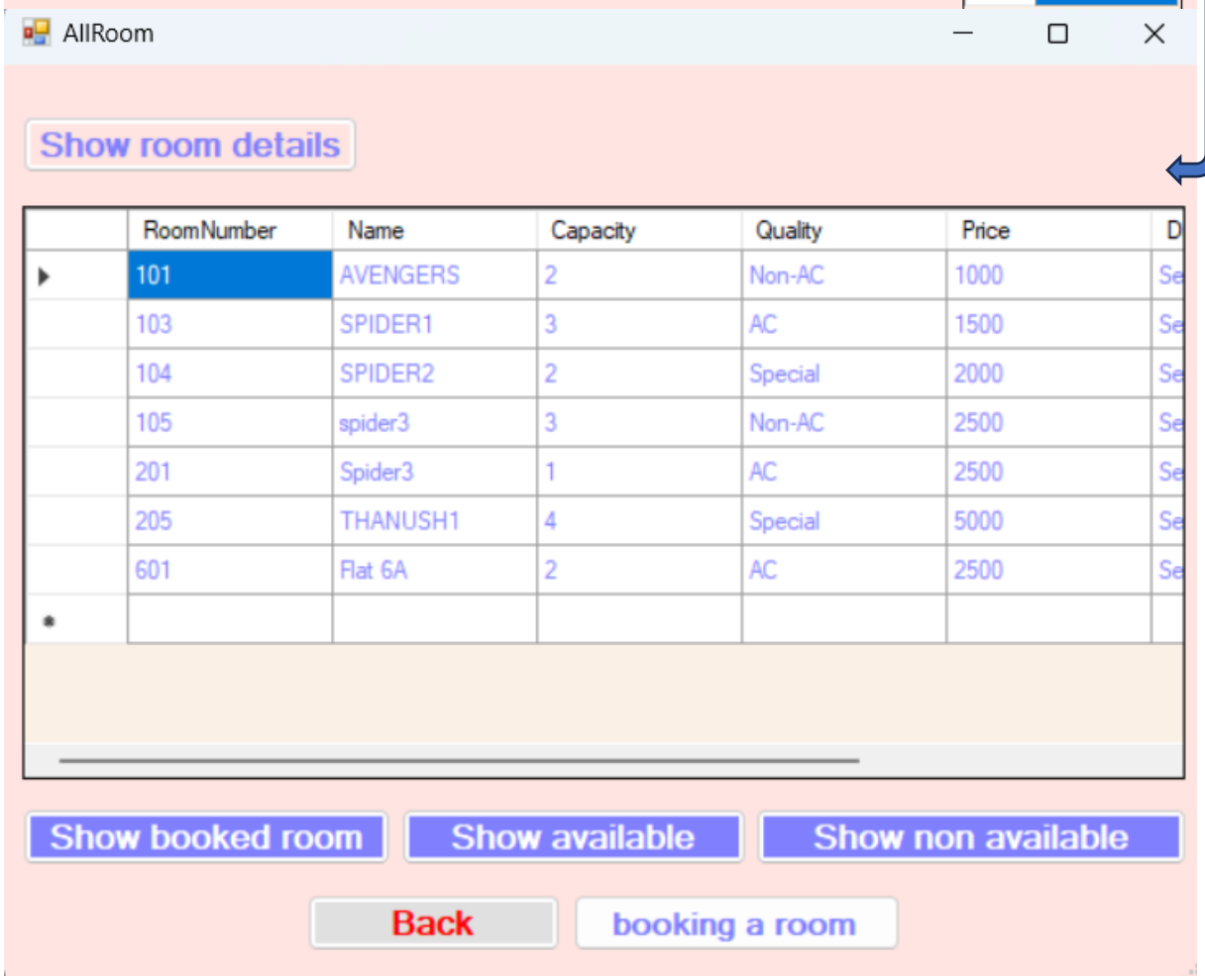
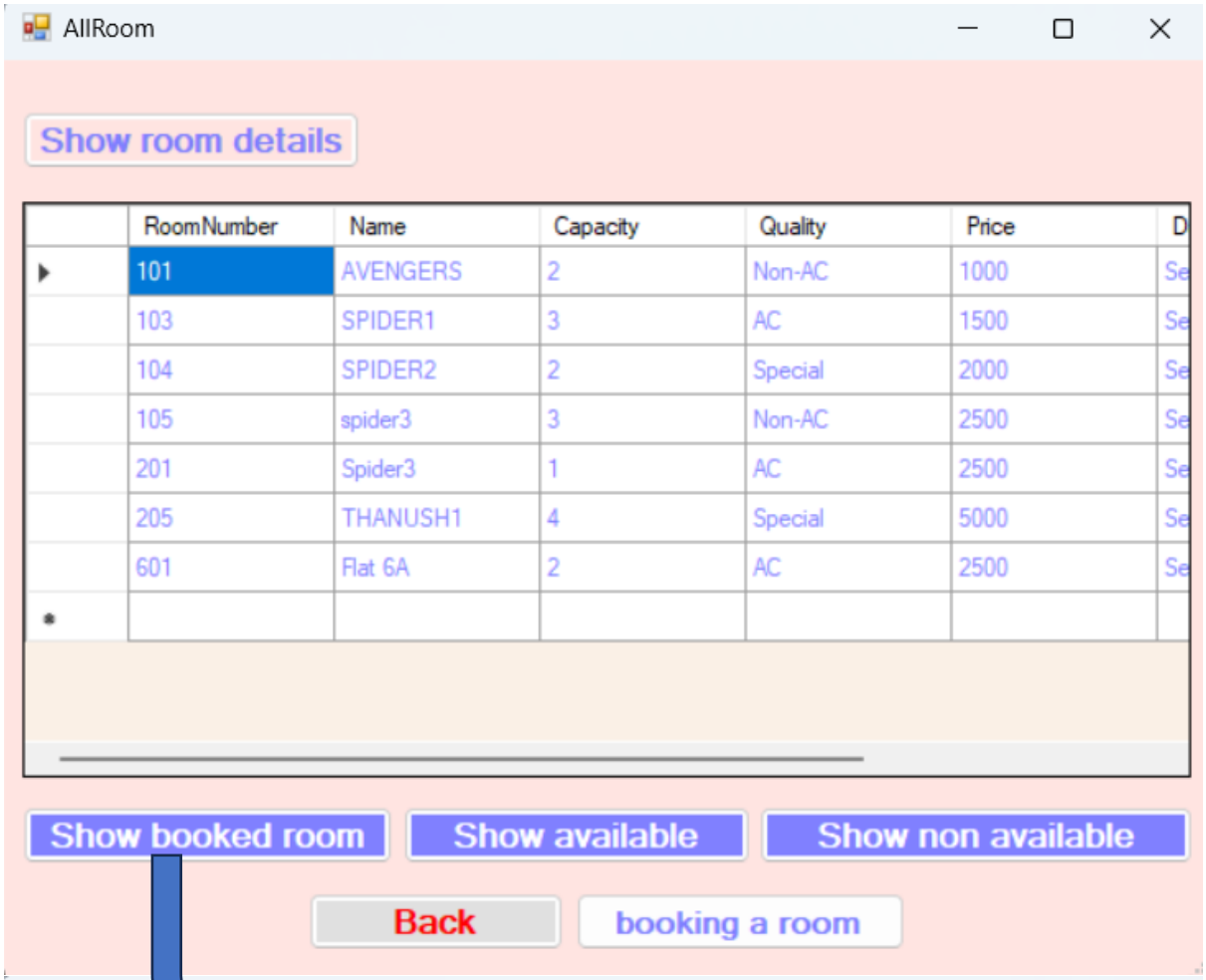
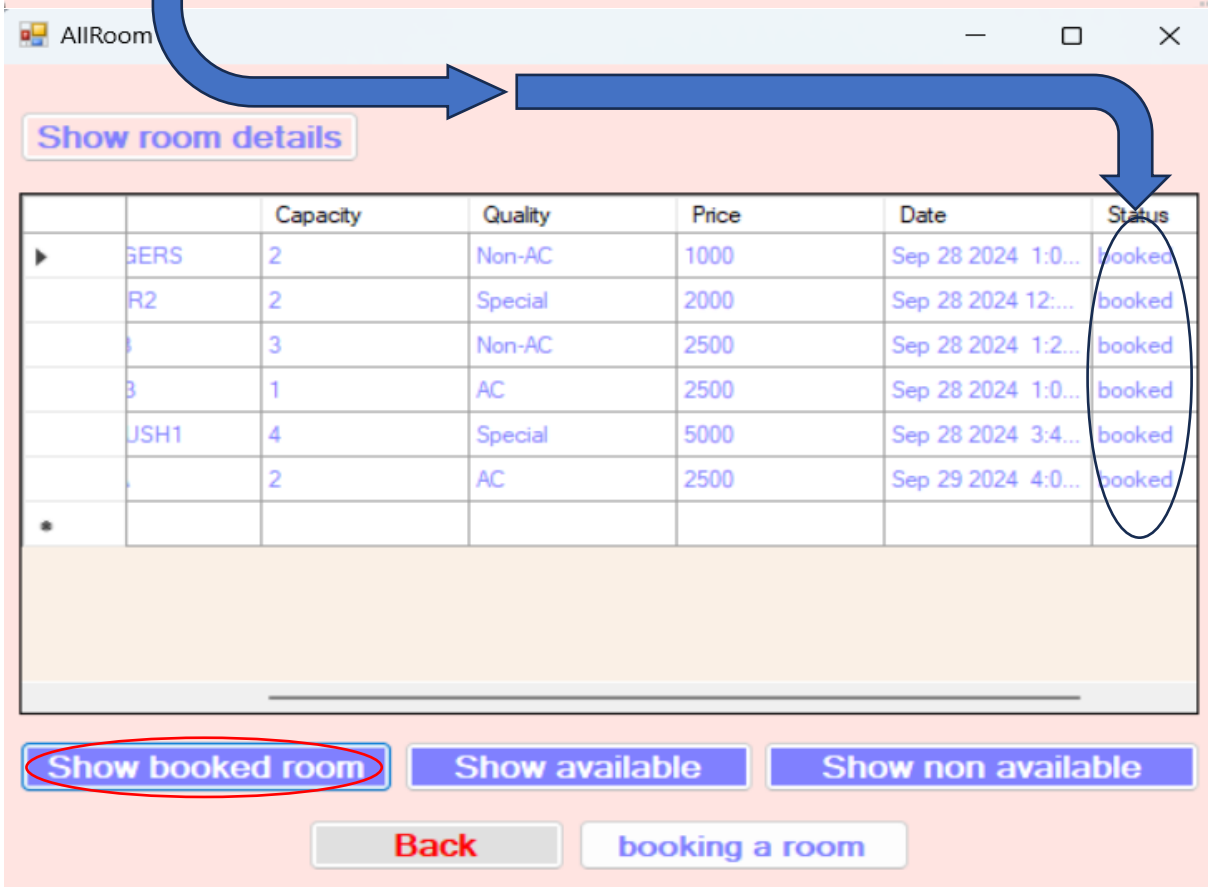
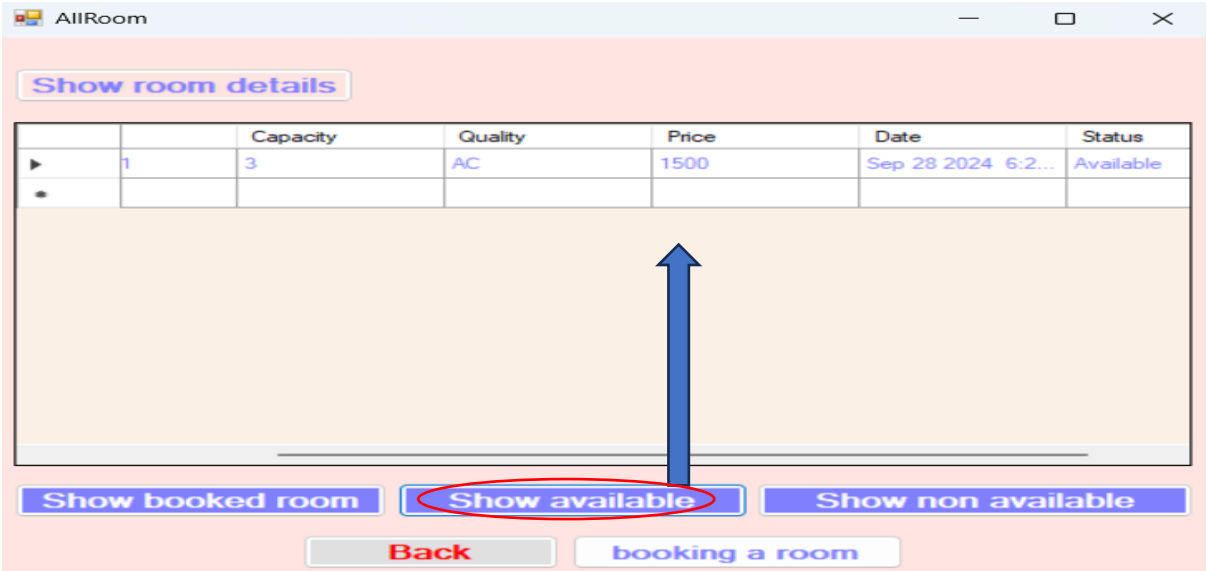
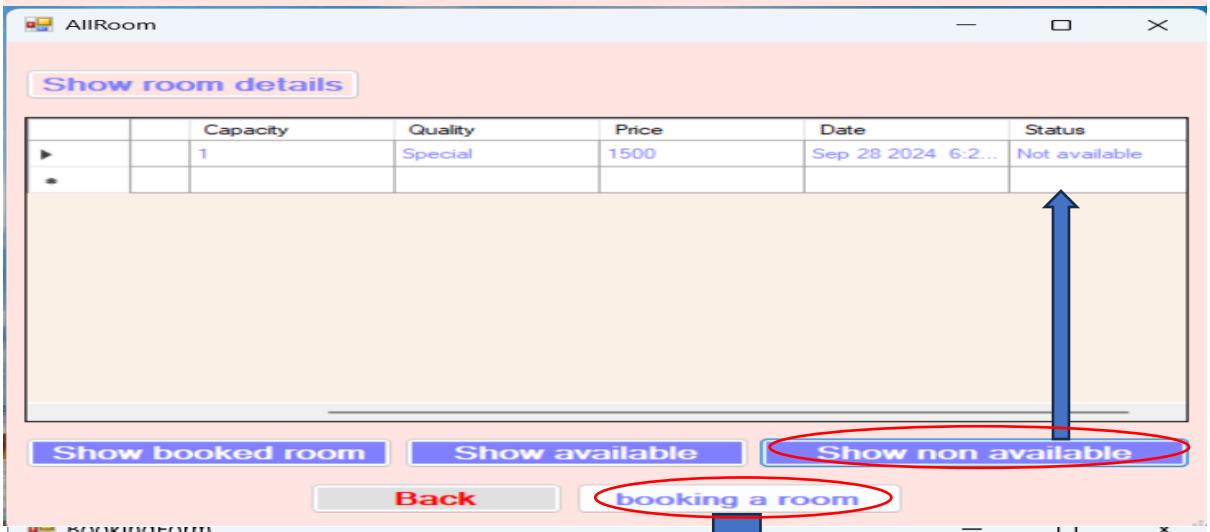
THANUSH1
4
Special
5000
601
Flat 6A
2
AC
2500
Total Rooms
7

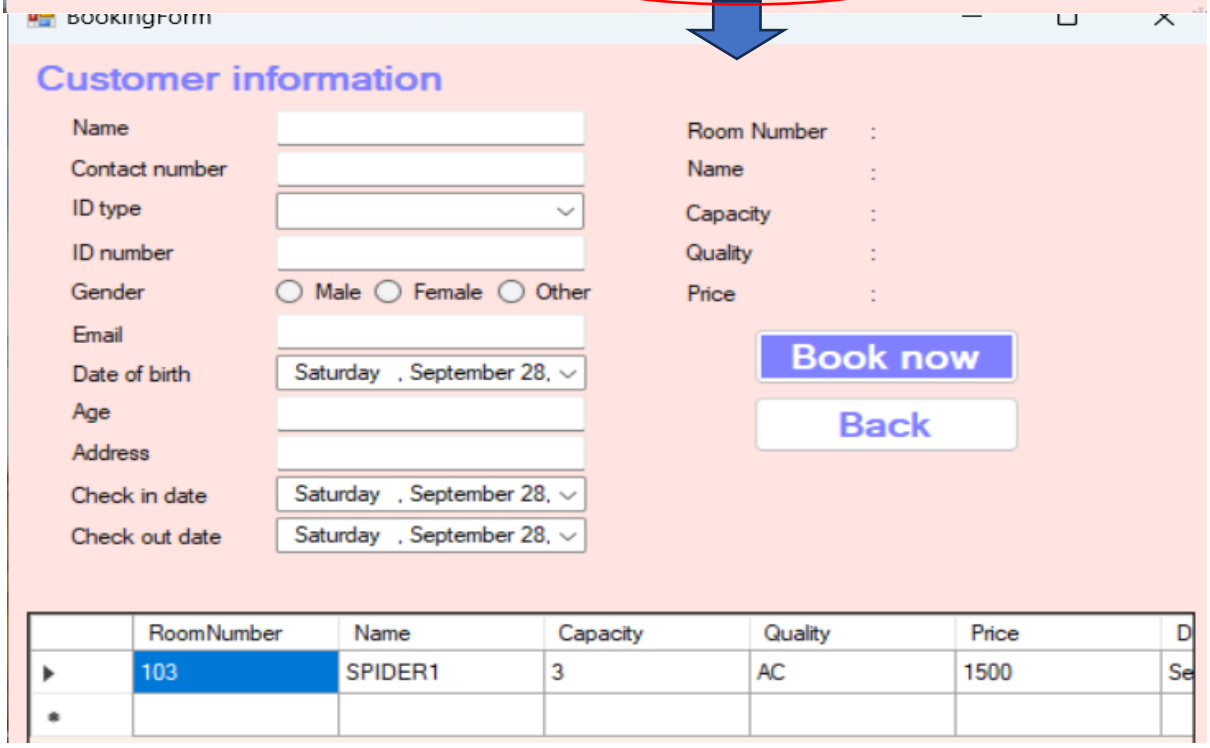

AllRoom
Show room details
RoomNumber
Name
Capacity
Quality
Price
101
AVENGERS
2
Non-AC
1000
103
SPIDER1
3
AC
1500
104
SPIDER2
2
Special
2000
105
spider3
3
Non-AC
2500
201
Spider3
1
AC
2500
205
THANUSH1
4
Special
5000
601
Flat 6A
2
AC
2500
Show booked room
Show available
Show non available
Back
booking a room

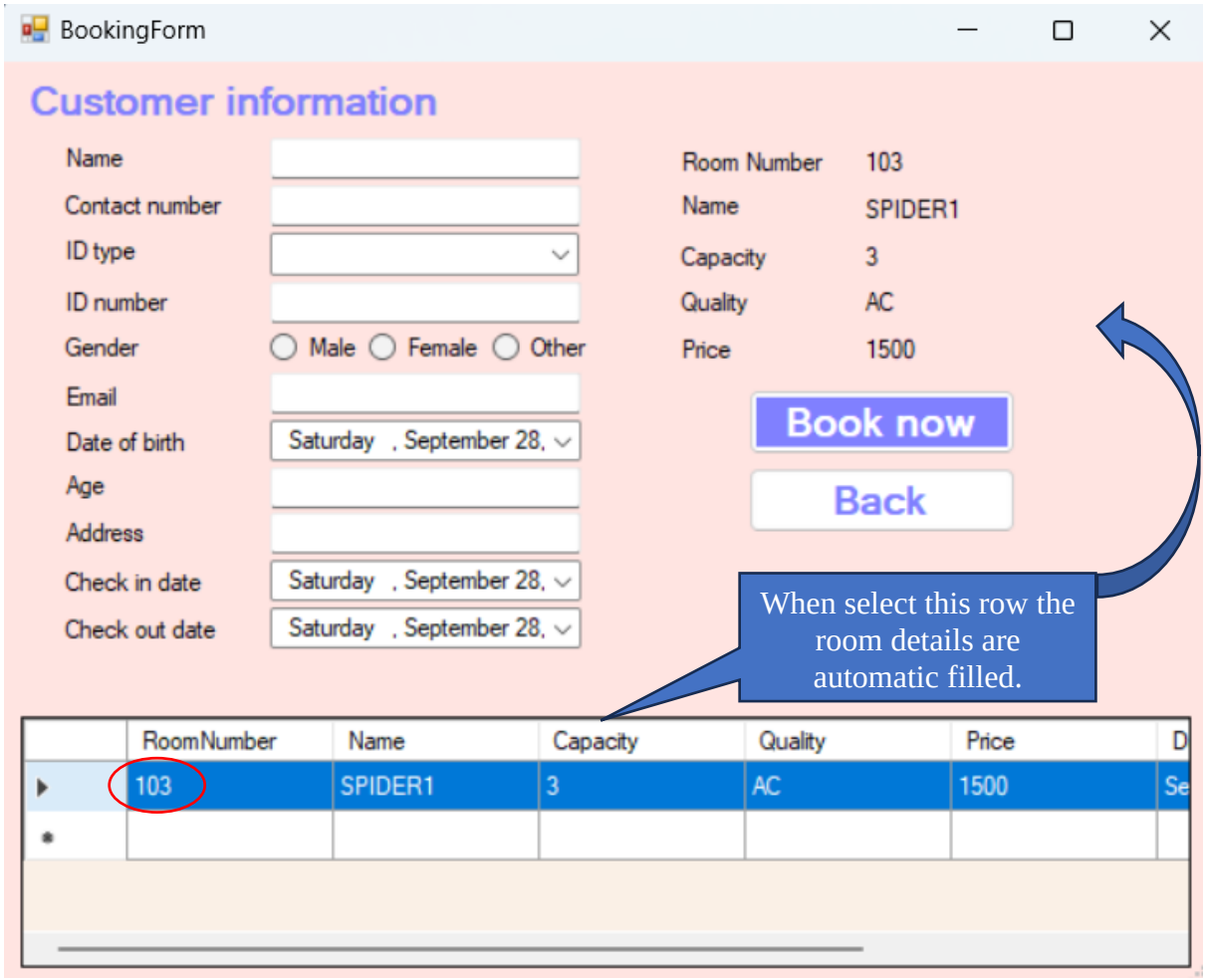

AllRoom
Show room details
RoomNumber
Name
Capacity
Quality
Price
101
AVENGERS
2
Non-AC
1000
103
SPIDER1
3
AC
1500
104
SPIDER2
2
Special
2000
105
spider3
3
Non-AC
2500
201
Spider3
1
AC
2500
205
THANUSH1
4
Special
5000
601
Flat 6A
2
AC
2500
Show booked room
Show available
Show non available
Back
booking a room

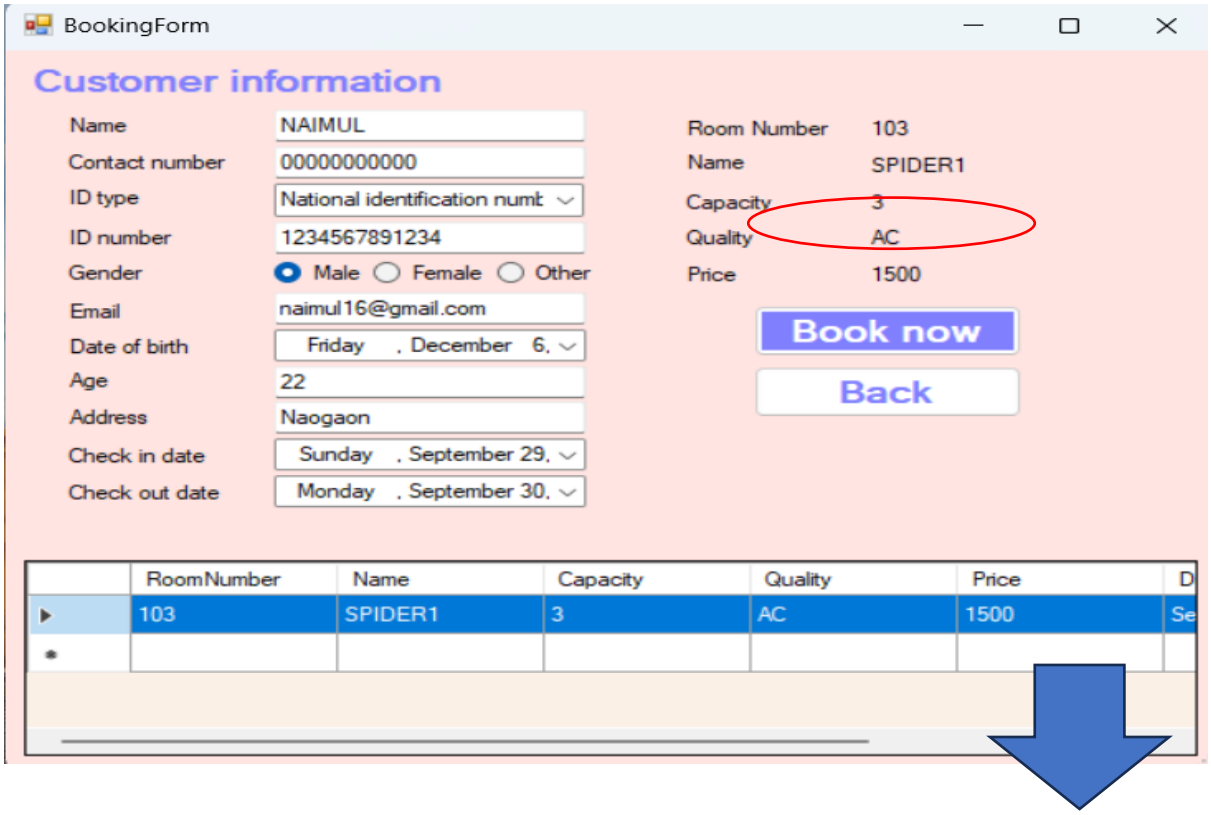

AllRoom
Show room details
Capacity
Quality
Price
Date
Status
GERS
2
Non-AC
1000
Sep 28 2024 1:0...
booked
R2
2
Special
2000
Sep 28 2024 12:...
booked
3
Non-AC
2500
Sep 28 2024 1:2...
booked
1
AC
2500
Sep 28 2024 1:0...
booked
USH1
4
Special
5000
Sep 28 2024 3:4...
booked
2
AC
2500
Sep 29 2024 4:0...
booked
Show booked room
Show available
Show non available
Back
booking a room

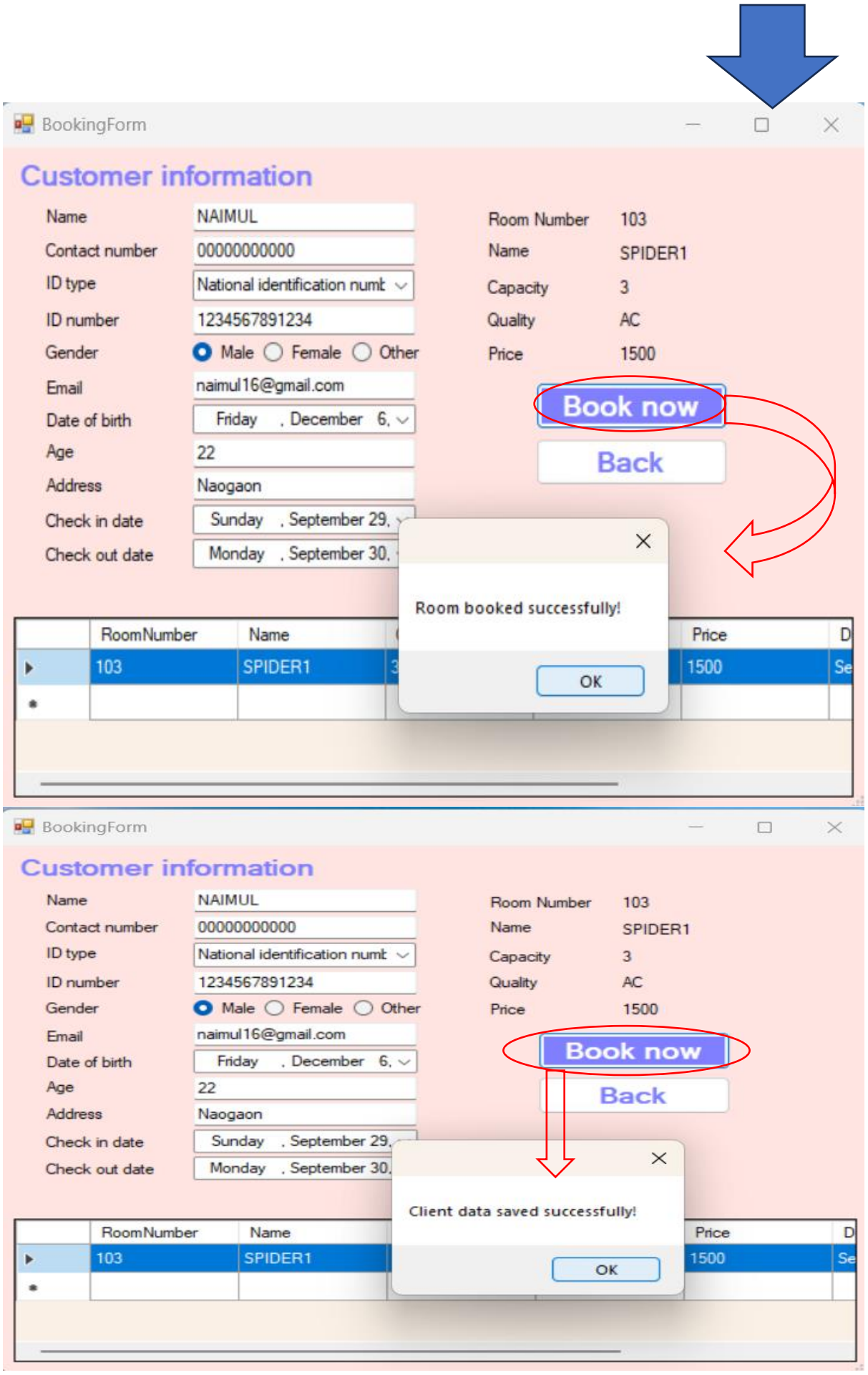

AllRoom
Show room details
Capacity
Quality
Price
Date
Status
1
3
AC
1500
Sep 28 2024 6:2...
Available
Show booked room
Show available
Show non available
Back
booking a room

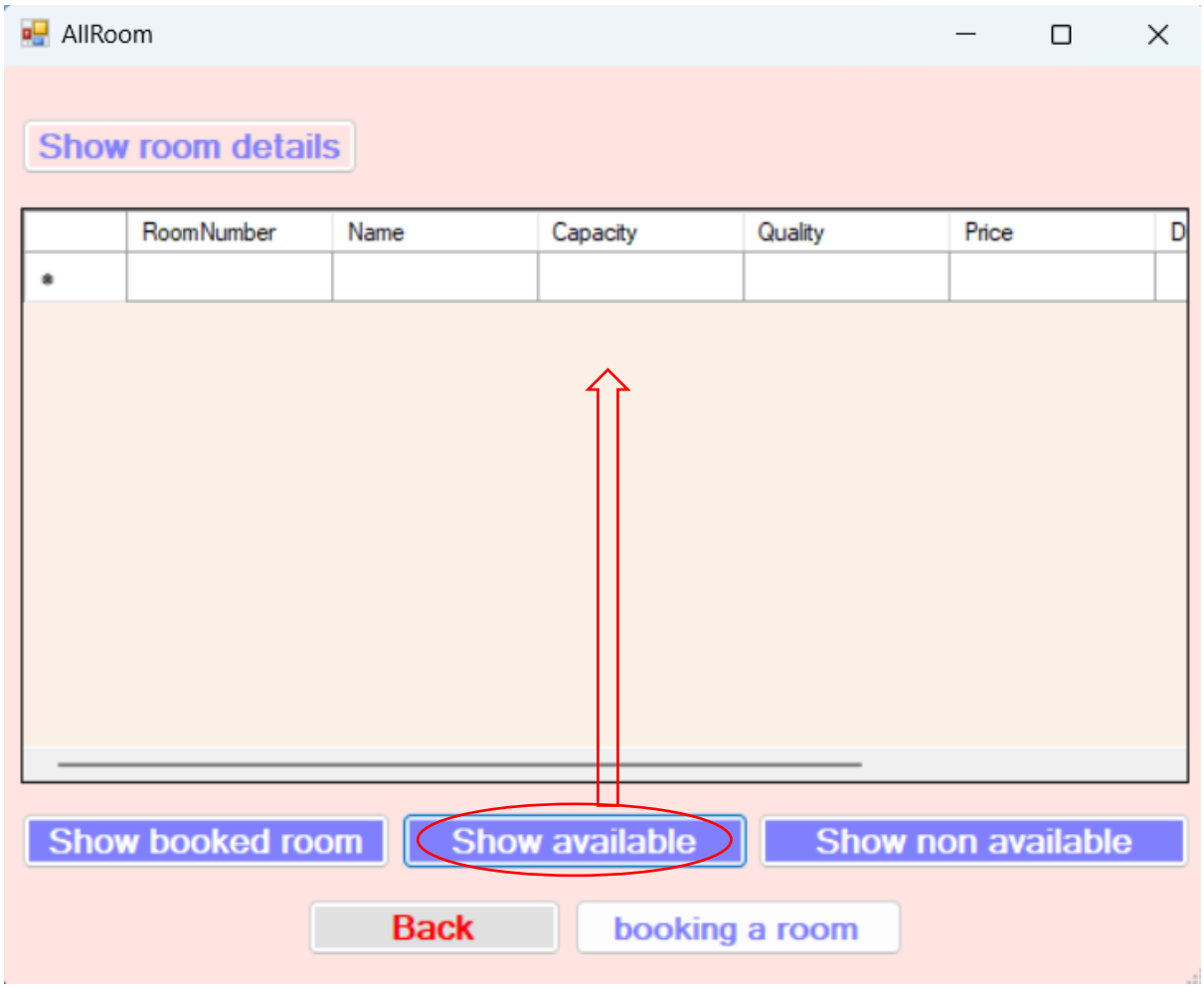

AllRoom
Show room details
Capacity
Quality
Price
Date
Status
1
Special
1500
Sep 28 2024 6:2...
Not available
Show booked room
Show available
Show non available
Back
booking a room


BookingForm
Customer information
Name
Contact number
ID type
ID number
Gender
Male
Female
Other
Email
Date of birth
Saturday , September 28,
Age
Address
Check in date
Saturday , September 28,
Check out date
Saturday , September 28,
Room Number :
Name :
Capacity :
Quality :
Price :
Book now
Back
RoomNumber
Name
Capacity
Quality
Price
103
SPIDER1
3
AC
1500


BookingForm
Customer information
Name
Contact number
ID type
ID number
Gender
Male
Female
Other
Email
Date of birth
Saturday , September 28,
Age
Address
Check in date
Saturday , September 28,
Check out date
Saturday , September 28,
Room Number 103
Name SPIDER1
Capacity 3
Quality AC
Price 1500
Book now
Back
When select this row the room details are automatic filled.
RoomNumber
Name
Capacity
Quality
Price
103
SPIDER1
3
AC
1500


BookingForm
Customer information
Name NAIMUL
Contact number 00000000000
ID type National identification numb
ID number 1234567891234
Gender Male Female Other
Email naimul16@gmail.com
Date of birth Friday , December 6,
Age 22
Address Naogaon
Check in date Sunday , September 29,
Check out date Monday , September 30,
Room Number 103
Name SPIDER1
Capacity 3
Quality AC
Price 1500
Book now
Back
RoomNumber
Name
Capacity
Quality
Price
103
SPIDER1
3
AC
1500


BookingForm
Customer information
Name
NAIMUL
Contact number
00000000000
ID type
National identification numb
ID number
1234567891234
Gender
Male
Female
Other
Email
naimul16@gmail.com
Date of birth
Friday , December 6,
Age
22
Address
Naogaon
Check in date
Sunday , September 29,
Check out date
Monday , September 30,
Room Number
103
Name
SPIDER1
Capacity
3
Quality
AC
Price
1500
Book now
Back
Room booked successfully!
OK
RoomNumber
Name
Price
103
SPIDER1
1500
BookingForm
Customer information
Name
NAIMUL
Contact number
00000000000
ID type
National identification numb
ID number
1234567891234
Gender
Male
Female
Other
Email
naimul16@gmail.com
Date of birth
Friday , December 6,
Age
22
Address
Naogaon
Check in date
Sunday , September 29,
Check out date
Monday , September 30,
Room Number
103
Name
SPIDER1
Capacity
3
Quality
AC
Price
1500
Book now
Back
Client data saved successfully!
OK
RoomNumber
Name
Price
103
SPIDER1
1500


AllRoom
Show room details
RoomNumber
Name
Capacity
Quality
Price
D
Show booked room
Show available
Show non available
Back
booking a room

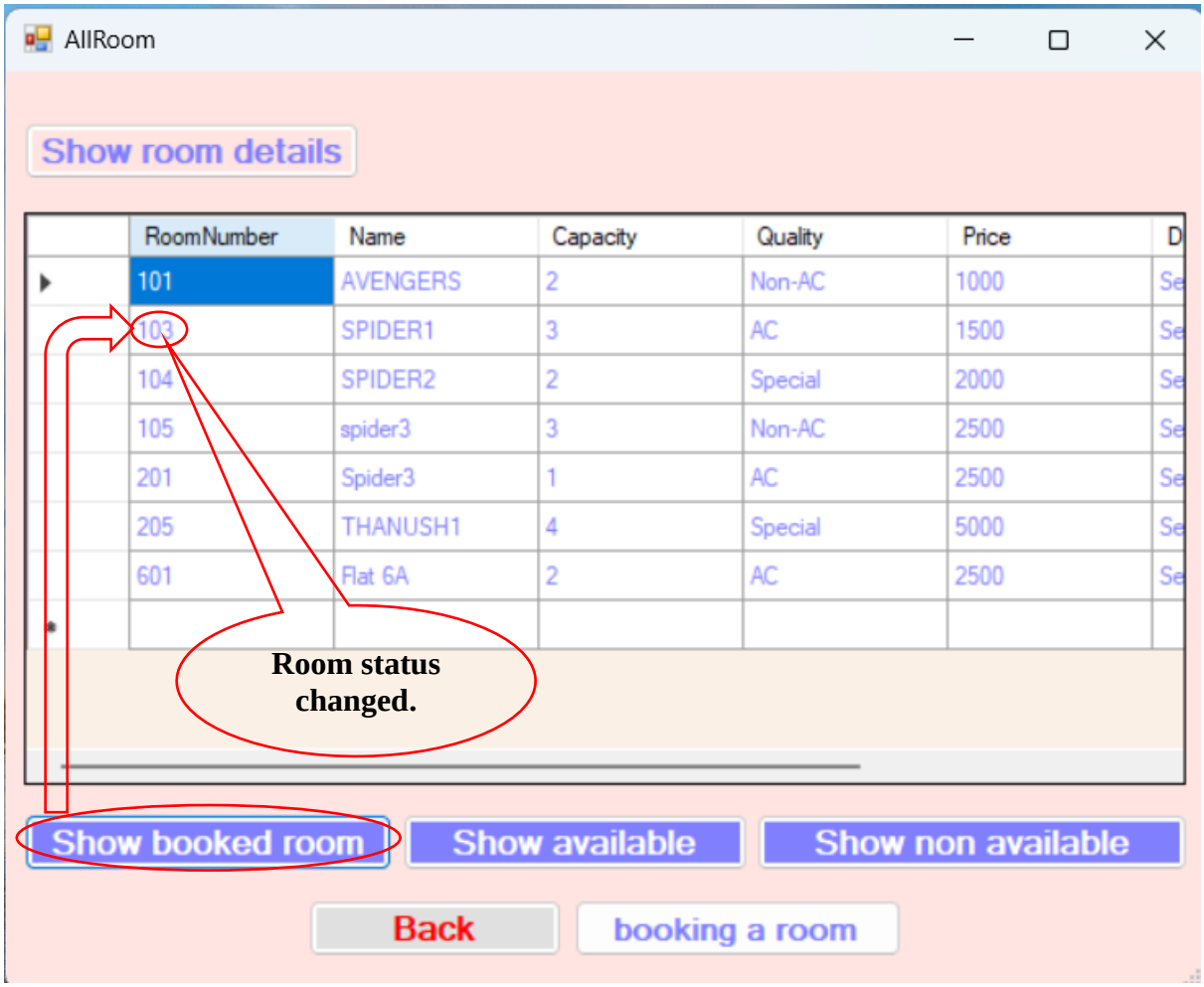


Figure : Customer & Room manage.