SHAHEED ZULFIKAR ALI BHUTTO
INSTITUTE OF SCIENCE AND TECHNOLOGY

Final Year Project Report

Room Rover

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January 15, 2024

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Karachi Campus

Declaration of Authorship

We, Gaitri Punjwani (ID: 2012381) and Vinay Kumar (ID: 2012413), hereby certify that the research presented in the "Room-Rover" report and its accompanying report are the product of our separate efforts. We mostly worked on this project while we were pursuing a bachelor's degree at this university. Any cases in which any part of this report was previously submitted for credit toward a degree or certification at this university or any other has been made clear. We have always given due credit and acknowledgment to the published works of those we consulted while conducting our research. When direct quotes from outside sources are used, the appropriate citation is given. With the exception of these quotes, all of the content in this report is our own

Signed:

Date: 30th December' 2023

Project Description

The website "ROOM-ROVER" for student housing accommodations is notable for being an easy-to-use platform that links professionals, students, and landlords in a seamless manner, making the entire process of finding appropriate housing more efficient. Thanks to the user-friendly features of our platform, users can easily search for verified properties that fit their preferred budget and location in terms of amenities.

 The website includes a thorough review system and a strong property verification process to emphasize credibility. For all users involved, this commitment guarantees the development of a dependable and trustworthy community. With safe payment methods and committed customer service, the platform improves user experience overall and gives users peace of mind during the rental process. We are steadfast in our commitment to helping users along the way. Our platform is committed to offering a smooth and reliable experience for all parties involved, from the first search for lodging to the completion of secure payments.

Every property on our platform undergoes a rigorous verification process to ensure its legitimacy. This builds user trust while also improving the quality and safety standards of accommodations. The program successfully reduces the possibility of coming across fraudulent listings by carefully inspecting properties before making them searchable, providing a sense of security to both renters and homeowners.

Acknowledgement

In the name of Allah, the Most Gracious, the One who gave us the wisdom and strength to start this research project. Many people provided invaluable advice and support, which enabled this project to be completed successfully. We are extremely grateful to have had this kind of support during the project. We would like to express our profound gratitude to Sir Khawaja Mohiuddin our supervisor from the Shaheed Zulfiqar Ali Bhutto Institute of Science and Technology's Computer Science faculty. His office door was always open, and he was always available to help with any problems we ran into or to answer any questions we had regarding our writing or research. The unwavering assistance, collaboration, and drive of Sir Khawaja Mohiuddin were crucial to the accomplishment of our study. We would like to express our gratitude to our teachers, whose wisdom and depth of experience lit our way. We also owe our loving parents and other family members a deep debt of gratitude for their steadfast encouragement and support. We also express our sincere gratitude to the SZABIST staff for their invaluable assistance, as they allowed us to use their equipment and supplies, which made the project possible to finish. Finally, we would like to thank Shaheed Zulfiqar Ali Bhutto Institute of Science and Technology for the inspiring environment that they have provided for us. The dedication of the institute to providing high-quality education, the helpful faculty, and the demanding academic environment have continuously inspired and increased the self-assurance of each and every student.

Table of Contents

Revision History

Name	Date	Reason For Changes	Version

Project Proposal

for

Room Rover

Version 1.0 approved

Prepared by Vinay Kumar

Gaitri Punjwani

Shaheed Zulfiqar Ali Bhutto Institute of science and Technology Karachi

September5th,2023

1. Introduction

The main purpose of Room Rover is to simplify the process of finding and securing suitable homes or rooms for rent through our website. This allows users to create user profiles and interact with other users for getting vacancies functionality like flat booking or room search. it also lets tenant build their profile, and set their own customized post for other users to connect. for Moreover, this platform will have a review system for users to rate their experiences. This project will be useful for both, owner and tenant, as it will remove the barriers between the two parties.

2. Objective

To make people facing legal problems find rooms or flats that meets their needs.

3. Problem Description

Finding suitable housing is a time-consuming and often frustrating process. Tenants face multiple obstacles the need to shift through countless websites and listings, incomplete property information, and uncertainty about safety and legitimacy. For those looking to share accommodation, finding compatible roommates can be challenging and relies on informal networks. Complex rental procedures and limited options further complicate matters, leading to missed opportunities and delays. And a review system makes this feature even better. The rating system is another great way to filter tenants or roommate who are already living, this will allow users to rate tenants after meeting through an appointment and it will also make roommates behave little more politely as they will make sure to get that 5-star rating.

Room Rover steps in to solve these problems. Our user-friendly online platform simplifies housing searches, offers transparent property listings, helps match roommates, and ensures safe and efficient rental processes. In doing so, Room Rover aims to revolutionize the way people find and secure their ideal living spaces, making it an invaluable solution for tenants and properties owner

4. Methodology

Our project will have a web app to ensure that every kind of user can use our project. we will be using React for the frontend and for the backend. we will be using NodeJS and MongoDB.
This project will be following MERN stack best practices and patterns.

In order to use our website, users will have to register for the first time and then use those registered credentials to login to our website. Both Main tenant and user will have a relatively different registration screen, while we won't ask much information from user, we will make sure main tenant provides enough information to avoid any scammers or time wasters on the website.

5. Project Scope

We have multiple features that help owner/main tenant and their potential user find each other sooner.
- Build their profile (owner/Main tenant only)
- owner/Main tenant Dashboard
- Login/Sign Up
- Search location by name
- Search location based on categories
- Book appointments
- Chat system
- Appointment scheduling
- Add review to owner/Main tenant profile

6. Feasibility Study

- **Risks Involved**: The major risk is that the owner/main tenant registering might not be that credible, but we will try to avoid that by making a strict registration system for owner/main tenant and approve account creation request manually through admin portal.
- **Resource Requirement**: The development requires Laptop/PC, VSCode.

7. Solution Application Areas

Room Rover's versatile platform has broad application within the housing rental market. Its primary function is to simplify the search for individual tenants seeking rooms or apartments for rent, providing an efficient and user-friendly experience. Additionally, it serves property owners and managers by enabling them to list their available accommodations and manage rentals effectively. Moreover, Room Rover aids those in search of compatible roommates, offering a streamlined roommate matching process, which is particularly valuable for students and young professionals seeking shared living arrangements

8 Tools/Technology

Coding Technologies
- JavaScript
- React
- ExpressJS/NodeJS
- MongoDB

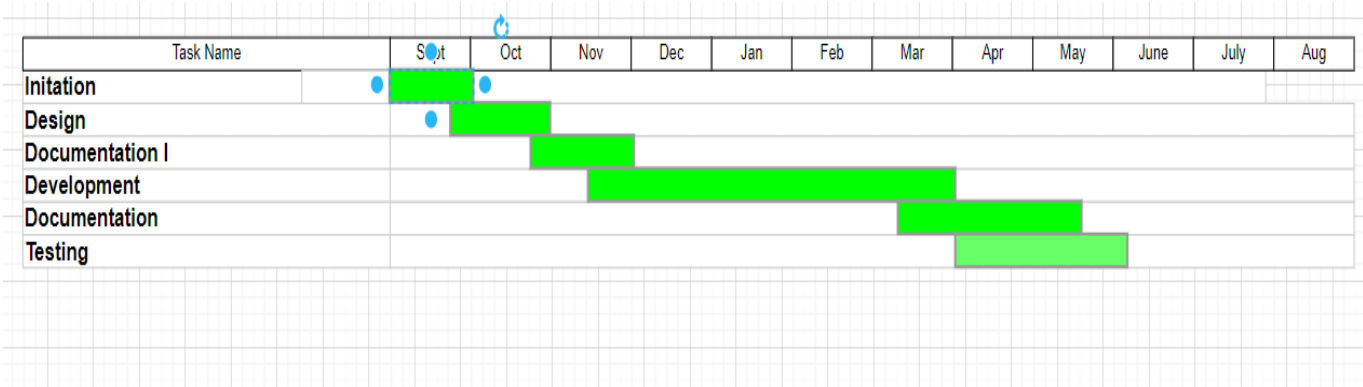Tools Required
- PC/Laptop
- VSCode
- Draw. io

9. Expertise of the Team Members

Both of us have good hands-on practice with coding. our team comprises of two members **Vinay kumar** and **Gaitri Punjwani** and our project advisor is Sir **Khawaja Mohiuddin**. Both of the team members have skillset for the tools and technologies we are using which are using HTML5, CSS3, JavaScript, React.js, Node.js, Express.js, MongoDB. We both have studied relevant courses to create this website.
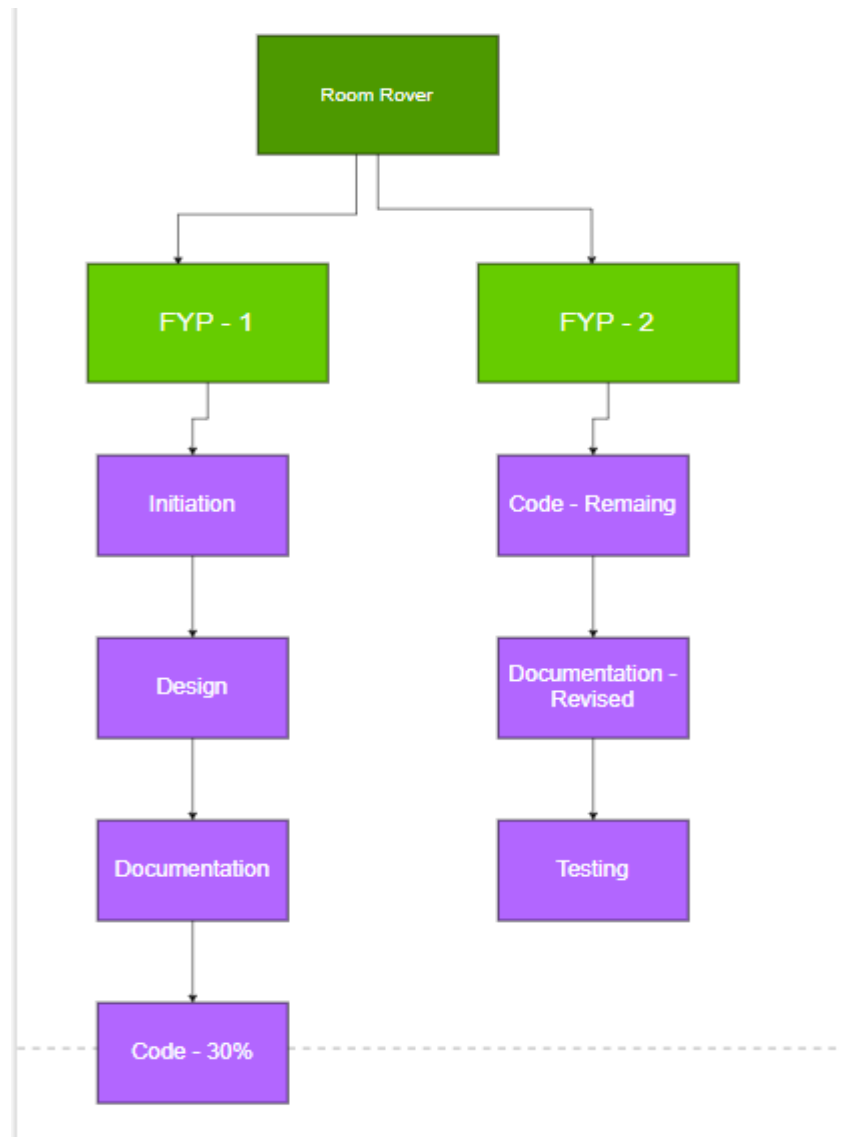
10. Milestones

- Documentation
- UI/UX Design
- Database Design
- Registration System
- Login Authentication
- Owner/ main tenant Dashboard
- Set Appointment Availability
- location Categories
- Booking Appointment
- Review System
- Chat system

11. Project Schedule

Task Name	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
Initation												
Design												
Documentation I												
Development												
Documentation												
Testing												

	Milestone	Start Date	End Date	Days
1	**Initiation**			
	Supervisor Meetings	28/8/2023		
	Project proposal	11/6/2023	18/6/2023	8
	Defense Prep	28/9/2023	5/9/2023	9
2	**Design**			
	UI/UX Design	18/9/2023	28/9/2023	10
	Database Design	29/9/2023	8/10/2023	10
3	**Documentation**			
	use Cases	9/10/2023	19/10/2023	10
	SRS	20/10/2023	27/10/2023	7
	ERD	28/10/2023	6/11/2023	9
	SDS	7/11/2023	17/11/2023	7
4	**Development**			
	Registration System	18/11/2023	30/11/2023	12
	Login Authentication	1/12/2023	12/12/2023	12
	Owner/main tenant Dashboard	13/12/2023	31/12/2023	19
	Location Categories	1/1/2024	15/1/2024	15
	Search location	16/1/2024	27/1/2023	11
	Booking Appoinment	28/1/2024	6/2/2024	10
	Chat system	7/2/2024	17/2/2024	10
	Review System	18/2/2024	10/3/2024	22

	Milestone	Start Date	End Date	Days
5	**Testing**			
	Test Case	11/3/2024	31/3/2024	20
	Bugs Fixing and Testing	1/4/2024	16/4/2024	16
	Testing Documentation	17/4/2024	30/4/2024	14
6	**Documentation II**			
	use Cases - Revised	31/4/2024	5/5/2024	6
	SRS - Revised	6/5/2024	13/5/2024	8
	ERD - Revised	14/5/2024	21/5/2024	7
	SDS - Revised	22/5/2024	30/5/2024	9

12. Work Breakdown Structure

13. References

- https://medium.com/aeologic/why-choose-mern-stack-323b4d95e4ea
- http://www.cs.iit.edu/~oaldawud/CS487/project/software_design_specification.htm
- https://app.diagrams.net/

Software Requirements Specification

for

Room Rover

Version 1.0 approved

Prepared by Vinay Kumar

Gaitri Punjwani

Shaheed Zulfiqar Ali Bhutto Institute of science and Technology Karachi

October 10th,2023

1. Introduction

1.1 Purpose

The purpose of this Software Requirements Specification (SRS) is to give comprehensive description of Final Year Project – "Room Rover" Website. The document entails details of the features/specifications both functional and non-functional, and the requisite environment. Further it outlines various technical aspects pertaining to hardware / software requirements, and non-technical information. It gives a clear overview of the project itself.

1.2 Document Conventions

This document uses Times New Roman font type and 18, 14, 12 font size for regular content, subheadings, and main headings respectively. The citing format shall be Modern Language Association (MLA).

1.3 Intended Audience and Reading Suggestions

- ➢ Tenants, both students and professionals who are in search of an accommodation outside of their hometown.
- ➢ Owners, who wish to place their property for rent under secured arrangements.
- ➢ Other *potential* vendor tie-ups, such as housekeeping staff, laundry shops, restaurants, security guards, and cable operators
- ➢ Website developers / managers who shall regularly review the app and make updates when required.

1.4 Product Scope

The above-mentioned idea will be implemented in the form a Web application for anyone who wants to use.

As the name, Room Rover, highlights that it is a digital platform, providing opportunity to students and professionals, from finding room, permanent/Temporary, Shared/Single to daily life services. It also provides the owner a secure platform to place their property for rent.

At initial stages, this application is aimed for properties in Karachi, being the largest city and economic hub of Pakistan, and where people come from various corners of the country. New cities will be added with the passage of time and marketability. Moreover, other features such as laundry, maid, and home chef are also important for the tenants; however due to time constraints, these features may not be considered now.

Further, the target market will be narrow from tenant end (students and professionals) and broader from owner end. Tenant's safety and hygiene will be the focus of this website. The experience is intended to keep fully online; however, physical visits are accommodated on client request.

1.5 References

- *Student Accommodation Made Easy | Student.com*
- *https://www.airbnb.com*
- *https://www.zameen.com*
- *https://roomiapp.com/*
- *https://housinganywhere.com*
- *https://www.studyabroadapartments.com/?referral=GoAbroad*

2. Overall Description

2.1 Product Perspective

This idea came across after assessing the existing problems that students and professionals face while searching for a safe and secure accommodation outside of their hometown. They must surf here and there, instead of single easy-to-use platform. In addition to trust issues, the presence of middleman / agents / brokers, make it costly and hectic for students/professionals.

On the other side, the owners with idle properties find it difficult to give on rent and must rely on multiple brokers. Owners sometimes are even reluctant to offer their property to bachelors.

Our aim is to bridge this gap and provide one-stop digital platform, in the form a website, to ensure smooth, cost-effective and safe onboarding procedure.

2.2 Product Functions

The objective of this Website is to facilitate students and professionals with a digital platform/marketplace (in the form of Website) to ease the process of securing a safe and better place to live in major cities of Pakistan. Coming from remote areas, it becomes difficult for individuals to arrange an accommodation; therefore, we wish to cater their needs. This platform will ensure end-to-end verification of tenants and owners, and the objective is to make entire process easier, transparent, and cost-effective.

This website will allow following tasks:
- ➢ Tenants (students and professionals) may create their unique IDs on the Website.
  Before account activation, their credentials will be verified from the set of provided documents.
- ➢ Tenants will be able to search properties according to their preferences and filters, such as location, accommodation type, rent range, nearby landmarks, Single/shared etc.
- ➢ Property owners may create their unique IDs, before uploading property details for rent. Owners' details along with that of their property will be verified via documents and physical visit by support team.
- ➢ Tenants may book the accommodation as per availability and consent from the respective owner
- ➢ Both parties will be obliged to reach an e-agreement (duly vetted) before payment exchange happens.
- ➢ Tenants will have the option to pay online.
- ➢ Both tenants and owners may reach out via web for any queries or complaints.
- ➢ The parties can keep a track record under the unique IDs.

- ▪ Signup/Login
- ▪ Filter Searching
- ▪ Request Visit
- ▪ Book Room
- ▪ Booking Cancel
- ▪ Lodge complains
- ▪ E-agreements
- ▪ Post Adds
- ▪ Ask Query
- ▪ Edit profile
- ▪ Payment

2.3 User Classes and Characteristics

The project consists of three type of user classes: Students\Professionals, Owners, Admin

- ➤ **Student:** Students can register to become a verified member, view property, filter searches, book room, cancel bookings and can request a physical visit. They also can make a payment, place queries and lodge them complain, in a hope to get courteous support from our consultants.
- ➤ **Owner**: Owner can Sign-up\Login, place query, post adds, lodge complains, provide services and make a custom-agreement.
- ➤ **Admin**: Admin can login, manage posts and profiles, provide accommodation information, handle booking and cancellation requests.

2.4 Operating Environment

Software: Visual Studio Code
Operating System: Windows
Database: Mongo DB

2.5 Design and Implementation Constraints

- ➤ Interface Constraint

This project will be implemented in the form of a website, and one major constraint may be functioning of interface to be effective.

- ➤ Hardware Constraint

One must have laptop or phone to run the Website respectively the users will require active internet connection.

- ➤ Software Constraint

Project available on Website only.

- ➤ Legal Constraint

Tenancy Agreements need to be vetted and mutually executed.

- ➤ Environmental Constraint

Not applicable as in fact, this Web will save cost, time and energy.

- ➤ Language Constraint

Initially, this application will be launched in English language.

➢ User Constraint

  ❖ Tenant and property owners must have a valid / active email address to sign-up.
  ❖ Login credentials will be required to keep safe and secure.
  ❖ Parties to have active bank/telecom account to facilitate documented payment.

2.6 User Documentation

We will provide users with three documents mainly, Software Requirements Specification, which provide detail description of features and functionalities of the project. Then the next document is Software Design Specification which specifies the design of the application, providing an understanding of what it is to be built and how it is expected to be built. Lastly, Test cases, which identifies the expected outputs on provision of specific inputs and outlines the pass/fail criteria for determining acceptance.

For further guidance, there is a section of FAQs and a chat room for further consultancy.

2.7 Assumptions and Dependencies

Parties have adequate know-how of surfing. Since it is Website, it is assumed that user possesses any devices, with stable internet connection.

3. External Interface Requirements

3.1 User Interfaces

The goal is to create a website that is visually appealing, easy to navigate, and accessible to a broad audience regardless of the device or operating system being used.

3.2 Hardware Interfaces

➢ Desktops and Mobile devices
➢ Device RAM should be at least 2GB or higher

3.3 Software Interfaces

The website will be connected through backend APIs that will share data, allowing fetching and insertion of data from and to the database, respectively.

3.4 Communications Interfaces

The website will require HTTP/HTTPS protocol, for communication with the backend.

4. System Features

4.1 Login

Use Case Name	Log-In into the system	
Use Case Summary	This use case describes how user will login on our website Room Rover	
Actor	Students, Owner, Admin	
Pre-Conditions	1. User must have an account already created before. 2. Username and password must be verified.	
	Actor Action	**System Response**
Basic Course of Events / Happy Path	1. User opens the application.	
	2. User taps Log-In.	3. System asks for Username and password.
	4. User enters Username & password.	5. System will verify Login details.
		6. System log in users into the system.
		7. The system displays the home screen.
Alternate Path	**5a)** If user entered wrong Username and password, then display message, "You have entered Invalid Username and/or password." **5b)** If user enters wrong password thrice, then display message "Reset Password."	
Post Condition	System will display the homepage.	
Author & Date	Vinay Kumar and Gaitri Punjwani	7-10-2023

Exception	1. If the account does not exist, then display the message, "Create a new account." 2. If Server is down, then display message, "Please ensure that your device has good connection to the internet and try again."

4.2 Sign-up

Use Case Name	Register/Create new account
Use Case Summary	This use case describes how student and owner will create account and become the verified member.
Actor	Student/Professional, Owner
Pre-Conditions	1. The user must be student any professional and owner. 2. No additional account available for same mobile number / email address. 3. User should be a Pakistani citizen. 4. Password must be at least 8 characters, with at least 1 number, 1 special character and 1 capital letter. 5. CNIC number must be valid. 6. Documentations (Student ID card, Owners' property proof) must be provided.

Basic Course of Events / Happy Path	Actor Action	System Response
	1. User opens the application.	
	2. User taps Sign-Up.	3. System asks for username, mobile number, email, CNIC number, and password.
	4. User enters the required User account information.	5. System will validate the entered user account information. ➢ Students will provide institute ID-card or professional will also provide the validation.
		6. OTP is sent to users' mobile number.
	7. User enters OTP	8. OTP is validated.

		9. System notifies the user regarding account creation on provided email address.
		10. The system displays the home screen.
Alternate Path		**4a)** If user enters password consisting of characters lesser than 8, with no special characters, then display message "Weak Password."
		4b) If invalid mobile number / email address is submitted; the user is informed by displaying a message, "Invalid mobile number / email address."
Post Condition		The User entered data is stored in the user account. Confirmation is sent to appropriate email address and home screen is displayed.
Author & Date	Vinay Kumar and Gaitri Punjwani	7-10-2023

Exception	1. If OTP is not delivered then system displays message, "Resend OTP." 2. If Server is down, then display message, "Please ensure that your device is connected to good internet connection and try again." 3. If user create an account with the phone number / email address that already exists, the system displays the message "Account has already been registered on given mobile number / email address."

4.3 Post-Ads

Use Case Name	Rooms advertisement	
Use Case Summary	This use case describes how Owner will make their property profile for advertisement.	
Actor	Owner, Admin	
Pre-Conditions	1. Owner must have an account already created before. 2. Owner should concur on provided terms and conditions.	
Basic Course of Events / Happy	**Actor Action**	**System Response**
		1. The system displays the home screen.

Path	2. Owner Click on "Add Property" button.	3. System will navigate you to the "Add New Property" page.
	4. Owner will provide following details: • Property Type [Flat, Town House, Bungalows, Upper/Lower Portion] • Property Title • Provide the location of the property • Mention no. of rooms available for rent • Provide the details of services that will be accommodated to the users/students like; Cook, Laundry, Dedicated parking space, Security arrangements and backup for electricity. • Facilities of water and gas supply • Provide property description.	
	• Specify the duration of property available for rent. • Specify price for rent/month. 5. Provide proof of property. 6. Upload images of the property taken from the best angles.	
	7. Owner will click on "Add Post" button.	8. System will display terms and conditions.

	9. Owner will confirm that it will abide by the rules and regulations.	10. System will post Add, which will be available to the user's screen.
Alternate Path	**7a)** When user leaves any field blank and click on "Add Post" then display message, "fill required field."	
Post Condition	Adds will be available to the user's screen	
Author & Date	Vinay Kumar and Gaitri Punjwani	7-10-2023
Exception	1. If it cannot proceed due to poor network then system will display message, "Please ensure that your device is connected to the internet and try again." 2. If the images size exceeds 2 MB, then throw an exception, "Please upload images under maximum quote of 2 MB".	

4.4 Book Room

Use Case Name	Book Accommodation	
Use Case Summary	This use case describes how student will book accommodation according to their preferences.	
Actor	Student /Professional	
Pre-Conditions	1. Student must have an account already created before. 2. Preferred accommodation type is available for rent.	
Basic Course of Events / Happy Path	**Actor Action**	**System Response**
		1. System displays the home screen
	2. User taps on Book Now button.	3. System asks for booking details, as follows: • Shared/Private room and Single/Shared Vacancy • Duration of living
	4. User provide desired room type and provide the duration of stay.	5. System will receive the request for onward processing.

		6. System will send a digital agreement to student.
	7. user will agree to the terms and condition of the agreement.	8. System will intimate both student and owner, regarding consent of the terms and conditions by both parties.
		9. system will direct the user to payment option.
	10. User proceeds for the payment.	11. System will send confirmation after successful payment.
Alternate Path	**4a)** If user requests duration of living less than six months, system will give an error, notifying, "The tenancy agreement shall be at least of six months". **4b)** If payment credentials provided is incorrect then display message, "Credit card\debit card\ telecom information is not correct."	
Post Condition	System books the accommodation required and stores the booking information into the booking history.	
Author & Date	Vinay kumar and Gaitri Punjwani	7-10-20223
Exception	1. If user provides the payment detail of debit\credit card and that has been blocked in general, then display message "Payment error." 2. The user does not receive booking confirmation after payment is sighted, due to system error.	

4.5 Reset Password

Use Case Name	Reset password
Use Case Summary	This use case describes how user will recover the password.
Actor	Owner, Student, Admin, Consultant.

Pre-Conditions	1. User must have an account already created before. 2. Active mobile number\email address on which account is created.	
	Actor Action	**System Response**
	1. User opens the application	
Basic Course of Events / Happy Path	2 User clicks on "Forget Password."	3. System will ask for mobile number\email address where OTP\password reset link will be sent.
	4. User will provide either of the details.	
	5. User will click on "Recover password"	6. System will direct user to password-reset page.
	7. User will enter new password.	8. Password changed successfully.
Alternate Path	**5a)** If user entered in-correct mobile number\email address then System shows the error of invalid details. **6a)** If user entered mobile number\email address that is not registered on Room Rover Website, then system will display message, "Error, account not found."	
Post Condition	Password will be recovered.	
Author & Date	Vinay Kumar and Gaitri Punjwani	7-10-2023
Exception	1. New password may not be received on mobile number due to network issues.	

4.6 Cancel Booking

Use Case Name	Cancel booking	
Use Case Summary	This use case describes how a student can cancel booking.	
Actor	Student /Professional and Owner	
Pre-Conditions	1. User must have already booked an accommodation. 2. User must be aware of bearing a penalty if cancellation of agreement is not performed within 7 days.	
Basic Course of	**Actor Action**	**System Response**

Events / Happy Path		1. The system displays the home screen
	2. User clicks on booked room.	3. System will show the booking details.
	4. User clicks on "cancel".	5. System will ask for the reason of cancellation.
	6. User specifies the reason for cancellation.	7. System will mention cancellation charges as per policy.
	8. User will click on cancel now.	9. System will ask, "Are you sure you want to cancel your booking?" and will show all the data about how much amount will be deducted and how much will be refunded.
	10. User will click Yes.	11. System will show confirmation notification about cancellation details below.
		12. System will send a message about booking cancellation on registered mobile phone\email address.
		13. System refunds within specified time.
Alternate Path	**5a)** If System cancels the booking itself then it will apologize for inconvenience and provide options for other nearest location possible and selected filters.	
Post Condition	Booked accommodation will be cancelled and status will be visible in the booking history and amount will be refunded within specified time.	
Author & Date	Vinay Kumar and Gaitri Punjwani	7-10-2023
Exception	1. Funds could not be refunded within specified time due to bank holidays or non-working days.	

4.7 Lodge Complain

Use Case Name	Lodge Complain
Use Case Summary	This use case describes how user will lodge a complaint.
Actor	Student/Professional, Owner
Pre-Conditions	1. There should be an existing agreement reference. 2. The users must have a substantial complain to lodge.

	Actor Action	System Response
Basic Course of Events / Happy Path		1. The system displays the home screen

	2. User clicks on complain.	3. System asks to fill following details:
		  i. Enter Complaint Title
		  ii. Enter Complaint Description

	4. User will fill required details after which it clicks on "Submit Complaint."	5. System will receive the complaint and generate an auto-email.
		6. System tries to resolve the complaint in specified days
		7. If there are no further complications, system will send an email regarding complain status.

Alternate Path	**4a)** Complaint will not be entertained if proper details are not given. 5a) Complaint will not be resolved if it does not raise any addressable issue. **5b)** Complaint will not be entertained if it violates terms and condition.
Post Condition	System will respond to the complaint at priority.
Author & Date	Vinay Kumar and Gaitri Punjwani	7-10-2023
Exception	1. Complaints may be ignored as mail may be dropped in spam. 2. Archive complain if no further responses are received against the complaint.

4.8 Filter Searches

Use Case Name	Search property according to desired facilities.
Use Case Summary	This use case describes how user will search property with respect to its budget, preferences, facilities and preferred location.
Actor	Students, Owner
Pre-Conditions	1. Scope should be relevant.

	Actor Action	**System Response**
Basic Course of Events / Happy Path		1. The system displays the home screen.
	2. User taps on "Filter Search".	3. Filter searches based on • Budget • Room Type • Nearest Location • Single / Shared Room
	4. User will provide the specified details.	5. System will fetch the required data and display respectively.

Alternate Path	**4a)** If there is no accommodation available for specified budget\room type\location, then system will display message "No result found for this request."
Post Condition	Specified searches will be displayed upon request.

Author & Date	Vinay Kumar and Gaitri Punjwani	8-10-2023
Exception	1. If it cannot proceed on searching, due to poor network then system will display message, "Please ensure that your device is connected have the good internet connection and try again."	

4.9 View Booking History

Use Case Name Use Case Summary	View booking history. This use case describes how user will check their booking history.	
Actor	Student / Professional	
Pre-Conditions	1. User must have previous record.	
	Actor Action	**System Response**
		1. The system displays the home screen
Basic Course of Events / Happy Path	2. User Taps on "Booking History."	2. System will show the details of previous record such as, ➢ Flat/House number ➢ Location of place ➢ Date and time of booking. ➢ credit total charged for the reservation. ➢ Booking status
Alternate Path	**3a)** If no bookings were made, then system will display message "No booking History."	
Post Condition	System will show the booking record.	
Author & Date	Vinay Kumar and Gaitri Punjwani	8-10-2023

Exception	1. If database is damaged due to system crash, or application software errors then all the booking history record will be lost.

4.10 Visiting Request

Use Case Name	Request for physical visiting of flat.
Use Case Summary	This use case describes how user can request for a physical visit of the property.
Actor	Student
Pre-Conditions	1. User must be logged in. 2. User must be in search of an accommodation. 3. User must be interested in that particular property.

Basic Course of Events / Happy Path	Actor Action	System Response
		1. The system displays the home screen.
	2 User Taps on "Book a visit."	3 System will ask for all the required contact details.
	4 User will provide details.	5 System will redirect the request to owner and will ask their availability and owner can accept or reject the request.
		6. System will send an email regarding visit schedule, according to its priority.

Alternate Path	**5a)** Visits can be re-scheduled, if there is no availability of the user on that day.
Post Condition	Physical visit of property.
Author & Date	Vinay Kumar and Gaitri Punjwani 8-10-2023
Exception	1. Unfavorable circumstances may delay the property visit.

4.11 Edit Post

Use Case Name **Use Case Summary**	Edit user profile or post. This use case describes how details can be update or deleted.
Actor	Admin, Owner, Student
Pre-Conditions	1. User must have a profile created before. 2. User must provide correct information to be edited.

Basic Course of Events / Happy Path	**Actor Action**	**System Response**
		1. The system displays the home screen.
	2. User selects and open "Edit user profile" option.	3. System redirects user to the page where the account related details are mentioned.
	4. User edits the desired information and save the changes.	5. System will verify the details and change tentative version to updated version.
		6. System prompts the user that account is successfully updated.

Alternate Path	**4a**) if user enters invalid information, then system will display message "Enter correct information".
Post Condition	The updated information can be used by the user to further operate the account.
Author & Date	Vinay Kumar and Gaitri Punjwani	8-10-2023
Exception	1. Due to some problems in server, changes are not made permanent\updated.

4.12 Place Query

Use Case Name	Place a Query
Use Case Summary	This use case describes how user can seek consultancy through live Chat Room.
Actor	Owner, Student
Pre-Conditions	1. User must be logged into the system.

Basic Course of Events / Happy Path	**Actor Action**	**System Response**
		1. The system displays the home screen.
	2. User will click on live chat.	
	3. User owner or student/professional can ask any query from each other	
	4. When their query is resolved with each other then they can further proceed.	

Alternate Path	**6a)** If user does not further respond to the query after specified time, then chat will end.
Post Condition	User can further lodge complaint if required where admin can show courteous support to user.
Author & Date	Vinay Kumar and Gaitri Punjwani	8-10-2023
Exception	In case of poor connectivity, the chat responses may face delay.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

We will be aiming to have a reliable and efficient system. For achieving this, we will write an optimized code, use powerful database so that it can handle large amount of data, without hindering the overall performance of the system. The application should be regularly monitored and updated to remove any bugs.

5.2 Safety Requirements

If the user wants to book an accommodation, then he/she must be registered through mobile number and CNIC number, email address, and then they can only Sign-in through valid email address and password. The application ensures safety in a way such that only the registered mobile gets the one-time password OTP authentication to sign-up. There must be a contingency plan for back-ups of data, so that data loss due to any unexpected event, can be preserved. Additionally, there must be backup for the network connectivity so that the user traffic remains seamless in case of some issue.

5.3 Security Requirements

System should use secured database, there should be no risk of data theft. Payment details of user should be secured. This feature also entails the recovery of forgotten password. Every panel will be able to access exclusively to their own boundaries.

5.4 Software Quality Attributes

System should use secured database, there should be no risk of data theft. Payment details of user should be secured. This feature also entails the recovery of forgotten password. Every panel will be able to access exclusively to their own boundaries.

5.5 Business Rules

In case of cancellation after confirmed booking, the refund will be provided after deduction as follows: ¬95% of the amount will be refunded, if booking is cancelled unilaterally within 7days. 15% of the amount will be refunded, if booking is cancelled unilaterally within 2-3 month. ¬No amount will be refunded, if booking is cancelled unilaterally after 3 months.

6. Other Requirements

In any website project, it is crucial to adhere to legal requirements to ensure that the site is used in a lawful and authorized manner, while also protecting copyrighted content. This includes compliance with data protection regulations, along with privacy and data security. To enhance user trust and transparency, clear terms and conditions, a privacy policy, and a copyright notice should be prominently displayed. Regular monitoring and updates to these legal documents are also necessary to maintain compliance and protect both the website and its users.

Appendix A: Glossary

N/A

Appendix B: Analysis Models

ERD

The diagram contains the following entities:

Tenant
- User-ID
- Name
- Email
- CNIC
- Phone No

Query
- User-ID
- After Sale service
- Check Status
- Enquire Room

Property
- Property-ID
- Property Title
- Location
- Appartment Type

Physical Visit
- property ID
- Property Title
- Date
- Time

Admin
- -ID
- Password
- Complaint lodge
- Query Resolution

Complaint
- User-ID
- Title
- Discription
- Category
- Complaint Lodge

Accomodation
- Property Id
- Property Title
- Room Type
- Budget
- Location
- Appartment Type
- Duration

Property Adds
- Property Id
- Property Title
- Price
- Room Type
- Location
- Appartment Type
- Duration

Owner
- User-ID
- Name
- Email
- CNIC
- Phone No
- Proof of property

Context diagram

Appendix C: To Be Determined List

N/A

Software Design Specification

for

Room Rover

Version 1.0 approved

Prepared by Vinay Kumar

Gaitri Punjwani

Shaheed Zulfiqar Ali Bhutto Institute of science and Technology Karachi

December 23th,2023

1. Introduction

1.1 Purpose

The purpose of this document is to offer a thorough overview of the "Room-Rover" website, a Final Year Project. The SDS will break down the project into components, providing detailed information on the purpose and implementation of each component.

1.2 Scope of the development project

Room-Rover," this digital platform is designed to offer students and professionals opportunities ranging from locating accommodation to accessing daily life services. Additionally, it provides property owners a secure platform to list their properties for rent. The primary goal of this website is to provide students and professionals in major cities of Pakistan with a convenient digital marketplace, simplifying the process of finding a secure and comfortable place to reside.
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1.3 Definitions acronyms and abbreviations

SRS	Software Requirement Specification
ERD	Entity Relationship Diagram
UI / UX	User Interface / User Experience
DB	Database
UML	Unified Modelling Language

1.4 References
 IEEE STANDARD 1016: Software Design Specification

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1.5 Overview of document

This document presents a comprehensive design of the features of 'Room-Rover.' The details are organized into the following sections:
Section 2: Entity relationship diagrams outlining the database structure
Section 3: Descriptions of individual modules
Section 4: Elaboration on the design specifics of user interface rules

2. System architecture description

This section provides an overview and rationale for the program's data and architectural design decisions.

2.1 Section Overview

This section sheds light on the database structures while emphasizing the limitations imposed by the project specifications. The key elements of the website are explained via data design and come with detailed explanations. In this section, the architectural design perspective is also used to elaborate on important features of the website.

2.2 General Constraints

his project is implemented in the form of an website, requiring a device with internet connectivity, a web browser, and the necessary input devices

2.3 Data Design

2.3.1 Database

Post Property

Attribute	Type	Key
ID	String	-
PostedBy ID	String	Object ID
Title	String	-
Property_type	String	-
Flat	String	-
Room	String	-

Location	String	-
Availability_period	String	-
Monthly_rent	Number	-
Deposit Price	String	-
Amenities	String	-
Advance_payment	String	-
Contact_name	String	-
Contact_number	String	-
Contact_email	String	-

Complaints

Attribute	Type	Key
ID	String	Object ID
Complain_title	String	-
Complain_description	String	-
Complain_category	String	-

User

Attribute	Type	Key
ID	String	Object ID
Username	String	-
Email_address	String	-
Contact_number	String	-
Password	Number	-
Gender	String	-

Adds

Attribute	Type	Key
ID	String	
Property_Title	String	-
Property_type	String	-
City	String	-
Rooms	Int	-
Address	String	-
Availability_period	String	-
Monthly_rent	String	-
Currency	String	-
Advance_payment	String	-
Additional_information	String	-
Facilities	String	-
Contact_name	String	-
Contact_number	Int	-
Contact_email	String	Object ID
Picture_public_id	String	-
Picture_public_URL	String	-

Query

Attribute	Type	Key
Query_Id	String	Object ID
Sender_Id	String	-
Receiver_Id	String	-
Message	String	-
Date	String	-

Booking Room Details

Attribute	Type	Key
Booking Process_Id	String	Object ID
Username	String	-

Date	String	-
Monthly_Rent	String	-
Duration_of_living	String	-
Property_Title	String	-

Book Visit

Attribute	Type	
Visit_Id	String	Object ID
User_Id	String	-
Property_Id	String	-
Date	String	-

OTP Generation

Attribute	Type	Key
ID	String	Object ID
Email	String	-
Code	Number	-
Expire In	Number	-

2.3.2 Internal Data Structure

Data is stored in binary JSON, comprising of JSON data providing a more compact design

2.4 Program Structure

We are thinking about the client-server architecture, where the client requests something and the server gives it to them. Scalability is encouraged by this model because it can support a large number of clients and give them a safe platform to use the application.

2.5 Alternatives Considered

Alternatively, we might have chosen the architecture, where the Model is responsible for overseeing data storage and retrieval, encapsulating both data and business logic. The View, on the other hand, manages user input and showcases information to the user, drawing from the model for data. Acting as the intermediary, the Controller ensures that the model is updated appropriately based on user inputs, thereby facilitating a seamless and effective user interaction. This design fosters efficient collaboration between the model, view, and controller components for a well-structured and interactive system.

3. Detailed description of components

Two different types of users will use this website, including Tenants and Owners.

3.1 Section Overview

The function, purpose, and dependencies of each component of the application will be provided under this section

3.2 Component and their Details

3.2.1 Sign Up

Identification	Register new account
Type	device with a web browser
Purpose	It creates an account, allowing users to login to their respective screens. It inserts the record of users provided details into the database.
unction	(Users provide details such as username, email address, password) , and the user account is created then.
Dependencies	Password and email should be valid.
Interfaces	Database and NodeJS are linked with rest APIs.
Resources	MongoDB NodeJS

Processing	Once user attempts to create account while clicking on 'Signup' then the input fields are validated and save to database through post().
Data	The data is validated and inserted into the database

3.2.2 Login

Identification	It accesses the user to the website
Type	An website
Purpose	It authorizes the users' credentials, and check whether the user is registered and redirect him into dashboard screen.
Function	User enters their valid email address and password and therefore they will be able to use the website.
Dependencies	User must already have an account and login credentials must match the details in database.
Interfaces	Request is generated from frontend to the backend through the method postLoginData(), when login button is triggered.
Resources	MongoDB database NodeJS
Processing	Provided information is then send to databases through post() function, which authenticates it.
Data	Data provided by the user will be validated from the records in database.

3.2.3. Post Property

Identification	Owner upload property for rent
Type	device with a web browser
Purpose	It provides one-stop platform for owners to post their property
Function	Owner provides details such as: • Property Type [Flat , studio apartment , 2 bed and drawing , 3 bed and drawing] • Property Title • Provide the location of the property. • Mention no. of rooms available for rent • Provide the details of amenities that will be accommodated to the users/students like; Cook, Laundry, Dedicated parking space, Security arrangements and backup for electricity. • Provide property description. • Availability of property • Specify the duration of property available for rent. • Specify price for rent/month. • Provide proof of property. • Contact info: like name, email, CNIC, phone no: • Upload images of the property taken from the best angles. Property is then uploaded, previewing the details that owner provided.
Dependencies	All the Property details should be filled correctly before being posted.
Interfaces	Database and NodeJS are linked with rest APIs.
Resources	MongoDB NodeJS
Processing	When owner fills out the detail form and apply for request of property upload then Property details are posted to database through post() method and shown to dashboard through get() method.
Data	All details are inserted to database

3.2.4. Book Room

Identification	Students can book desired room type in accordance to preferred budget and location
Type	Device with a web browser
Purpose	It allows students to book accommodation according to their preferences.
Function	Students provide details such as time duration of living, flat type along with room type (shared/private), and then request is further processed to admin for approval.
Dependencies	Request can only be processed if the preferred room type is available.
Interfaces	Database and NodeJs are linked with rest APIs.
Resources	MongoDB NodeJS
Processing	When student provides the booking details, then the request is generated to admin, and after its approval it is posted to database, and it is available to user in their booking history, allowing them to cancel booking after a period.
Data	Booking details are inserted to database after confirmation of the booking

3.2.5. Lodge Complain

Identification	User can lodge a complaint
Type	Form
Purpose	Students can lodge a complaint after booking of room and owners can also lodge complaint against student, if he/she violates the rules, and damage the property.
Function	User provides the complaint title, category and detailed description of complaint. An auto-generated email will be sent, confirming the relevance within the specified amount of time
Dependencies	Complaint can only be logged if it is significant and has an agreement reference.
Interfaces	Database and NodeJs are linked with rest APIs.

Resources	MongoDB NodeJS
Processing	When complaint is placed, it is directed to the consultant and admin, which tries to resolve at its priority.
Data	Complaint is saved to database.

3.2.6. Book a Visit

Identification	Students can wish to visit the property, before processing the booking
Type	Physical Visit
Purpose	This allows students to assess the physical condition of property and check whether the location is convenient.
Function	Students can request for visit anytime, by clicking the button "book a visit", after which the request will be processed to admin for further scheduling in accordance with the availability of owner.
Dependencies	User must be verified.
Interfaces	Database and NodeJS are linked with rest APIs.
Resources	MongoDB NodeJS
Processing	An email is generated specifying the day and timing of visit
Data	Visit schedule is stored in database

3.2.7. Edit User Profile

Identification	User can change email address, contact details, if incorrect details are added to database.
Type	Form
Purpose	It allows users to update personal information and maintain data up to date.
Function	User can update profile through settings.
Dependencies	User must have a profile already created before.
Interfaces	Database and NodeJS are linked with rest APIs.
Resources	MongoDB NodeJS
Processing	The updated information can then be used to manage the account.
Data	Data is updated in the database.

3.2.8. Place Query

Identification	Users can seek live assistance through 24/7 live chatroom.
Type	Live chat
Purpose	It allows users to clarify any information or resolve issues, enquire about room or booking process.
Function	It enables communication between user and admin, taking queries and responding them respectively.
Dependencies	It depends on stable internet connection.
Interfaces	Database and NodeJS are linked with rest APIs.
Resources	MongoDB NodeJS
Processing	Admin will provide courteous support to user.
Data	Complaint will be inserted to database.

4. User Interface Design

The UI design of 'Room-Rover' is described in this section.

4.1 Section Overview

- Designed components are in a customized manner to suit the application's needs.
- Maintain consistency in the interface design across different platforms.
- We have kept the website design simple and easy to understand.
- Usen plain language in error messages and pop-ups for better user comprehension.
- Maintained uniform use of colors, fonts, and icons for a cohesive design.
- Ensure the interface adapts seamlessly to various screen sizes and devices.
- Prioritize easy-to-follow navigation with clear and descriptive labels.
- Implement visual cues or notifications to inform users about their actio
- Design interfaces with considerations for users with disabilities.
- Keep the interface simple to prevent user overload.
- Present clear error messages to make website more user-friendly
- Highlight critical content and features prominently.
- Reveal information progressively to avoid overwhelming users.
- Conduct testing, gather feedback, and iterate for continuous improvement.

Describe and justify the conventions and standards used to design your interface.

4.2 Gui Components

Our GUI incorporates various elements to craft an interactive, enjoyable, and efficient user interface that meets user experience expectations. These components include:

- Button Variety: We've implemented an assortment of buttons, including Text buttons, elevated buttons, and Raised buttons, tailoring their styles to enhance the overall aesthetics.

- Card Design: Utilizing cards to present information, we've integrated a 3D effect along with a built-in drop shadow, enhancing the visual appeal and depth of the interface.

- List View Widgets: Employing list view widgets that offer scrollable effects, enabling content display in both vertical and horizontal orientations, ensuring a flexible and dynamic user experience.

- Customized Navigation Bar: We've personalized the navigation bar in specific sections of our application.

- Icon Integration: Leveraging a series of flat icons, we've enriched our UI with a diverse set of visual elements, contributing to a polished and presentable user interface.

- Color Palette Harmony: We've carefully selected a harmonious color palette throughout the interface to evoke a cohesive and visually pleasing design.

- Gesture Controls: Implementing intuitive gesture controls for certain actions, providing users with an alternative and engaging way to interact with the website.

- Responsive Design: Ensuring the interface's responsiveness across various devices and screen sizes, guaranteeing a consistent and optimized experience for all users

4.3 Detail Description

4.3.1 Room Rover Homepage
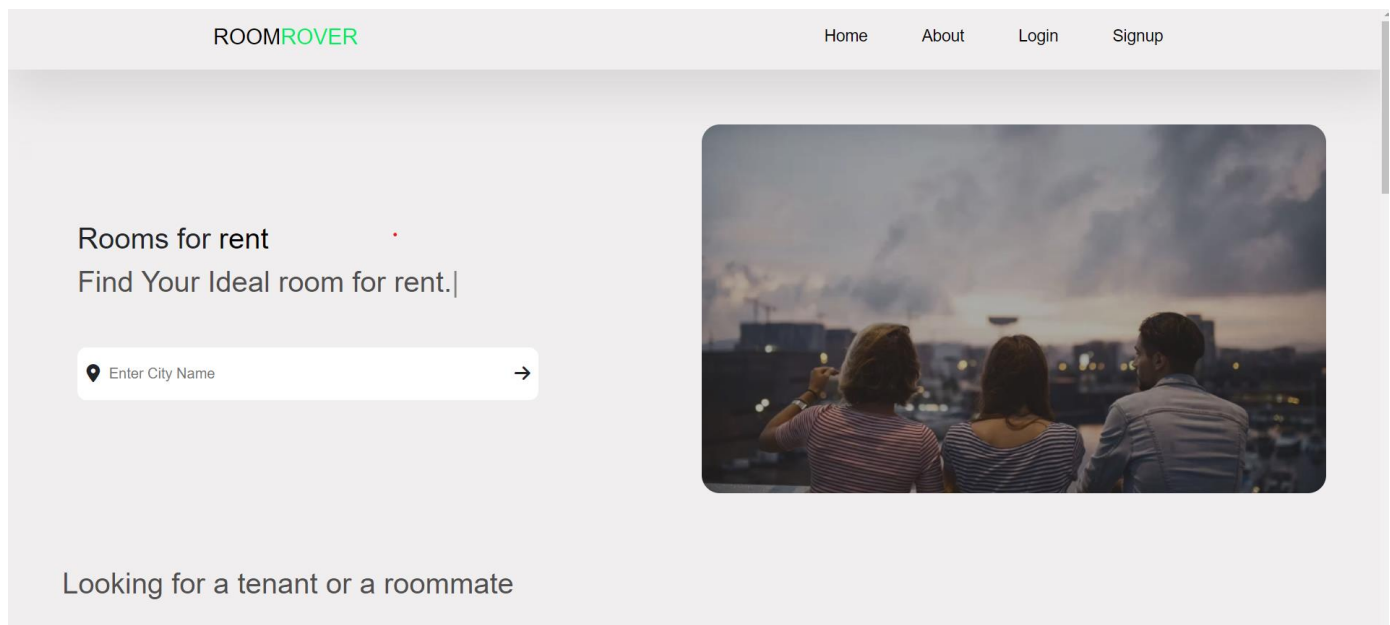
4.3.2 User Registration

Create Account

First Name:	Gaitri
Last Name:	Punjwani
Email Id:	bscs2012381@szabist.pk
Phone No:	03363240400
Password:	••••••••
Gender:	Male ○ Female ●

Register

Already have an account ? Login

Enter the Code

Enter the code sent to your email address to create
your account

Code

2287

Continue

OTP matched successfully

Don't have an account? Sign up

4.3.3 User Login

Login

Email Id   vinaychoithani223@gmail.c

Password   ••••••••   ⊙

Login

Forgot Password ?

Login Successful

Dont have an account ? Sign up

4.3.4 Forgot Password

Enter the Code

Enter the code sent to your email address to reset
the password of your account

Code

8695

Continue

Enter New Password

••••••••••

Confirm Password

••••••••••

Continue
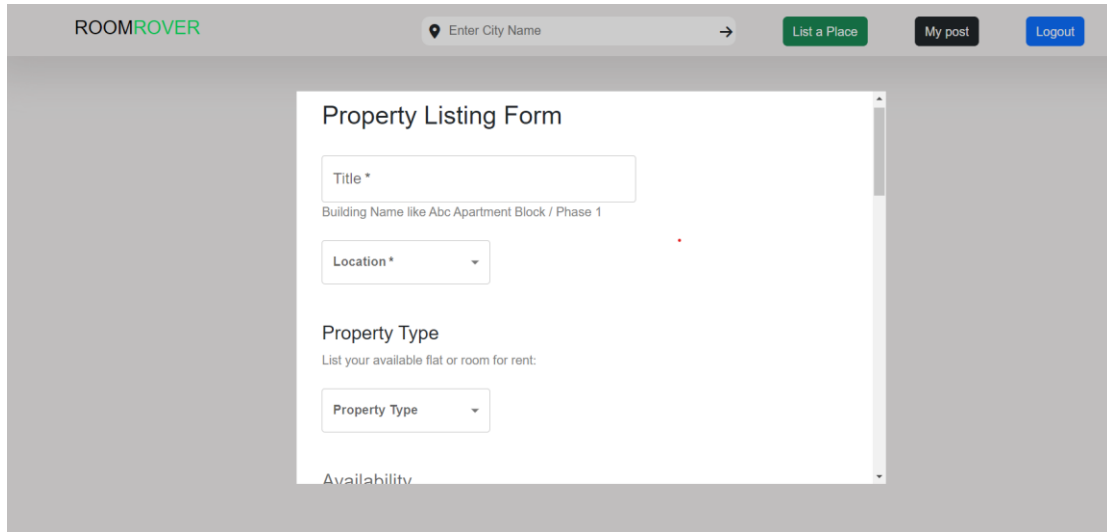
Password reset successfully

Don't have an account? Sign up
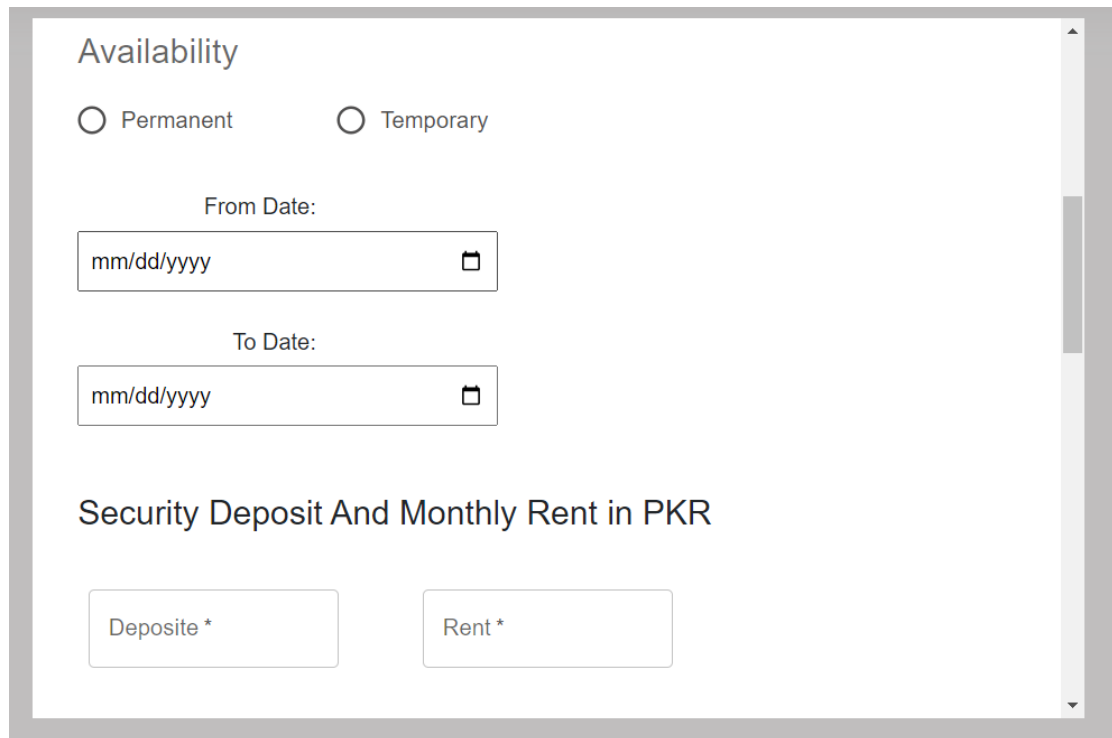
4.3.5 Room Rover Dashboard
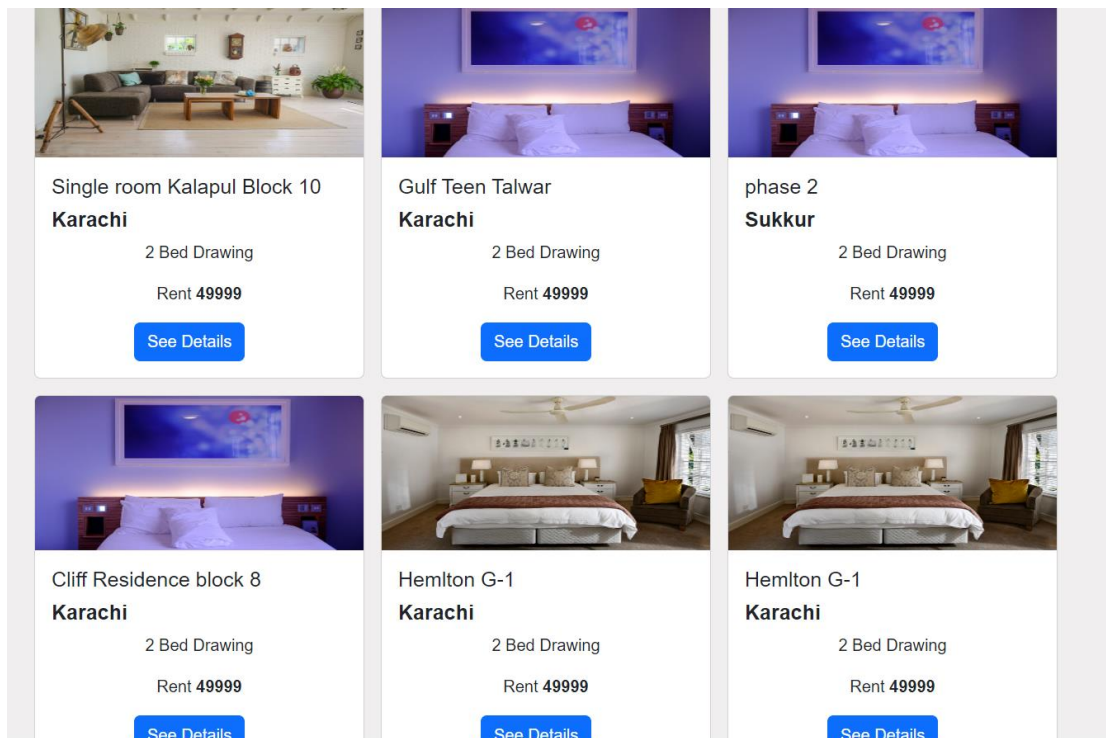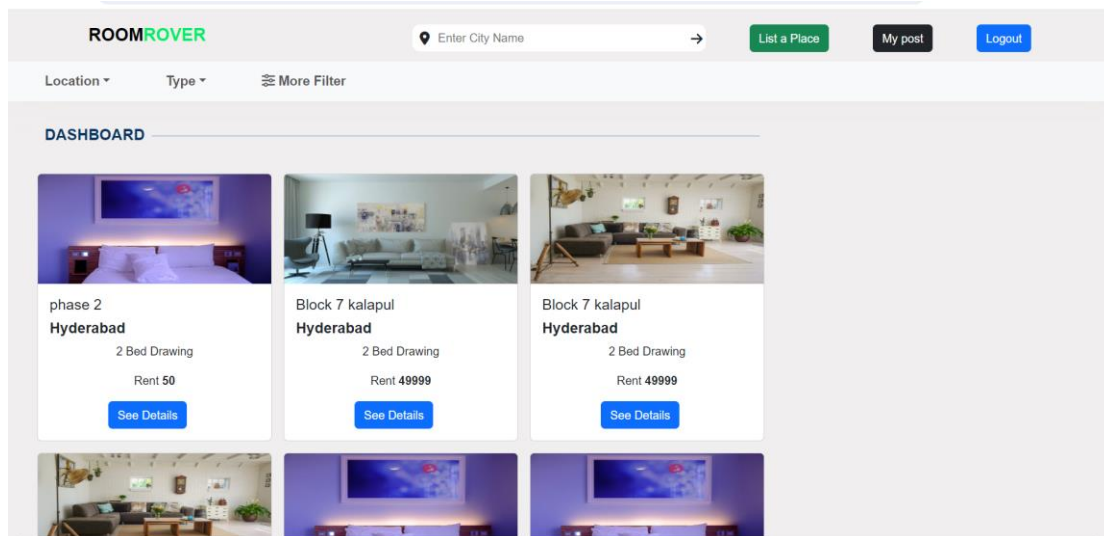
4.3.6 Property Listing Form

Utilities And Amenities

☐ Furnished   ☐ Bed

☐ Kitchen Availability   ☐ Internet and Cable TV

☐ Parking Availability   ☐ Air Condition

☐ Electricity, Water Gas   ☐ Laundry facilities

Add Description

1 words and 0 character

Choose file | No file chosen

Upload Pictures of your flat or room

Contact Form

Name

Email

CNIC (13-digit number)

Phone Number

SUBMIT

4.3.7 Update Delete post by user
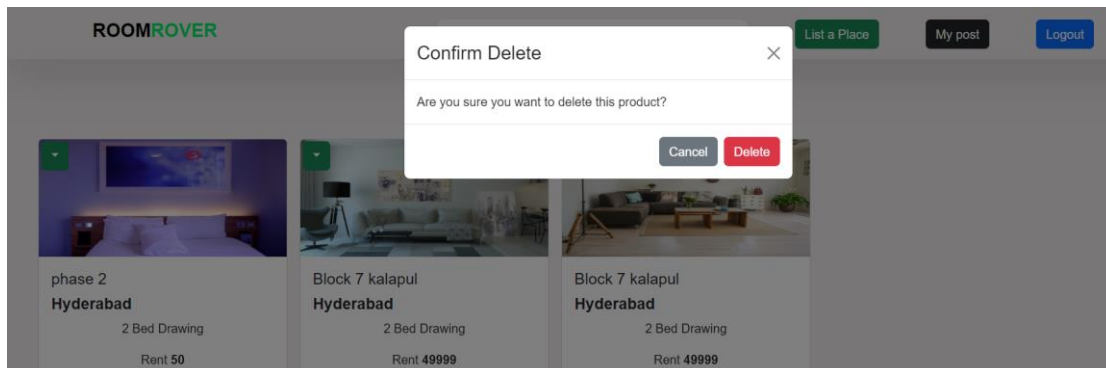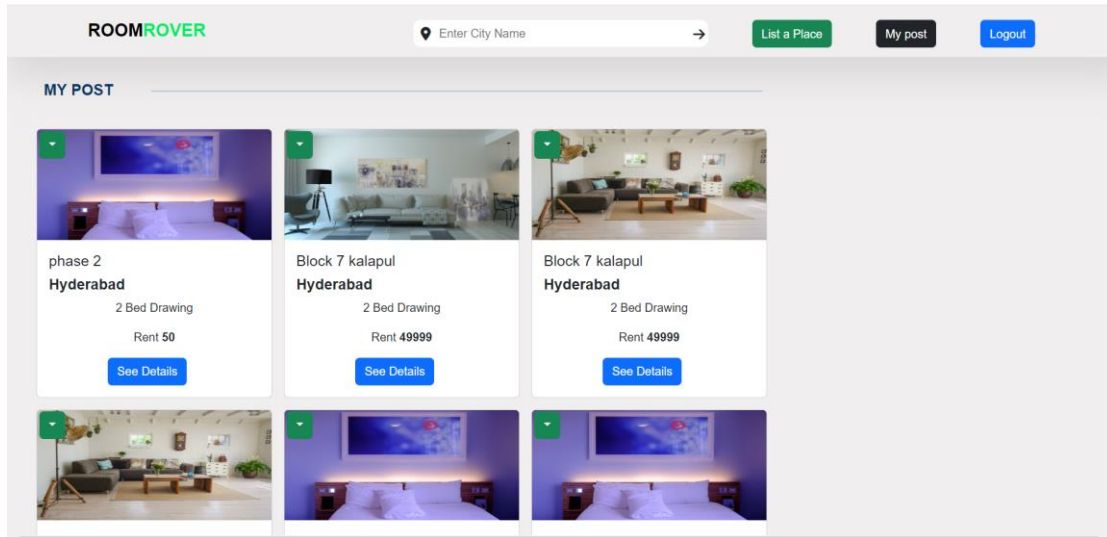
5. Reuse and relationships to other products

This platform is intended to fulfill the needs of tenants and students who are lacking access to a digital booking/uploading platform for accommodations. The whole development of the website has been done with an emphasis on meeting this particular need.

6. Design decisions and tradeoffs

The design decision is based on the principle of easy to use and simple user experience, so that the reach of the website is extended to broader public.

7. Pseudocode for components

Login()
Begin
Get email, pass
If (email == email address && pass == password)
Login Successfully
Direct to Dashboard
Else
Print (User Not Registered)
End

SignUp()
Begin
Get name, email_address, contact_number, password
If fields are empty
Print (Please fill in all the required fields)
Else
Details inserted to database
Redirect to login page
End

PostProperty
Begin
Get Title, property_type, Location, Rooms, Address, Availablity_period, Monthly_rent, date, pricing, amenities, description, postedByID , Contact-form
Deposit-Advance, Additional_information, Facilities, Contact_name, Contact_number, Contact_email, Picture_public_id, Picture_public_url
If fields are empty
Print (Fields are required)
Else
Details inserted to database and dashboard
Redirect to dashboard
End

Update Post()
Begin
Get Title, property_type, Location, Rooms, Address, Availablity_period, Monthly_rent, date, pricing, amenities, description, postedByID , Contact-form
Deposit-Advance, Additional_information, Facilities, Contact_name, Contact_number, Contact_email, Picture_public_id, Picture_public_url
If fields are empty
Print (Fields are required)
Else
Updated Details inserted to database and dashboard.
Redirect to dashboard

EditProfile()
Begin
Get name, email, password, profile_photo
If fields are missing
Print (Fields are required)
Else
Details updated in database
Redirect to dashboard
End

BookRoom()
Begin
Get duration_of_living, property_type, number_of_rooms
If (room_type == available)
Get Payment details
If Payment is successful
Insert details into database
Successfully book room
End

Lodge Complain()
Begin
Get complain_category, description
If(user == Registered)
If (booking == true)
Enable Lodge Complain button
Lodge complain successful
Else if (user == Not Registered)
Else
Disabled
End

Place Query
Begin
Get querytype
Response generated from admin
End

8. Appendices

8.1 Class Diagram

Physical Visit

Date
Property Title
Time

Visit()

Student

ID
Name
Email
Phone No:

login()
SignUp()
Book Room()
get_Booking_History
Complain()
Chat()
Search()
Logout()

Admin

ID
Password

Edit Profile()
Approval of Adds()
Validate()
Manage Complain()
Handle Query()

Query

Query ID
Sender ID
Receiver ID
Message
Date

Check Status()
After Sale Services()
Enquire Room()

Accomodation

Budget
Property Title
Location

Filter Search()

Rooms

Shared
Private

Select Room()

Property-Ads

Property Type
Property Title
Location
No: of Rooms
Duration
Price

Post Property()

Owner

ID
Name
Proof pf Property
Email
CNIC

Login()
SignUp()
LogOut()
Complain()
Chat()
Veiw Property()
Post Property()

Complaints

Title
Description
Category

Lodge Complain()

8.2 Object Diagram

8.3 State-chart Diagram
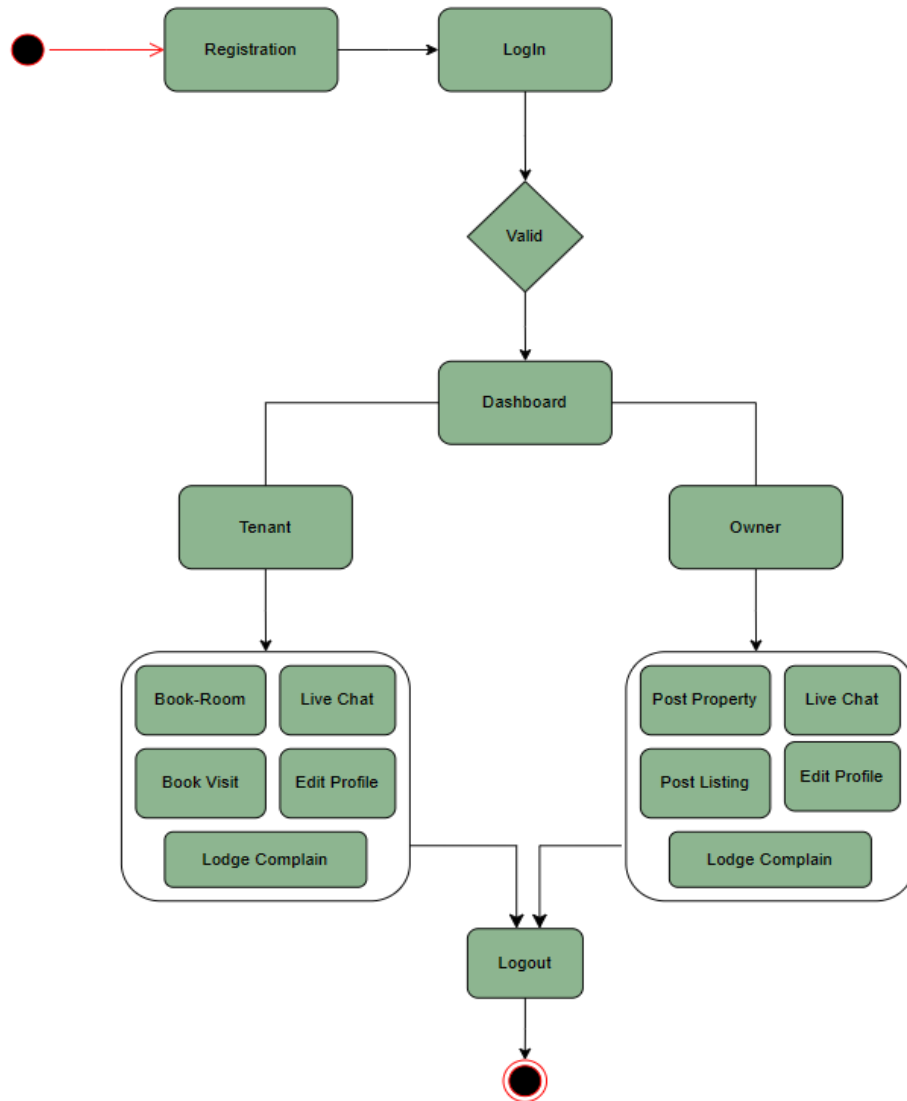
8.4 Activity Diagram

8.4.1 Register
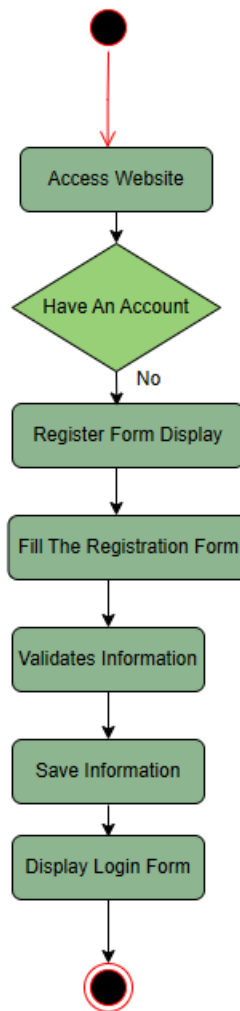
8.4.2 User Login
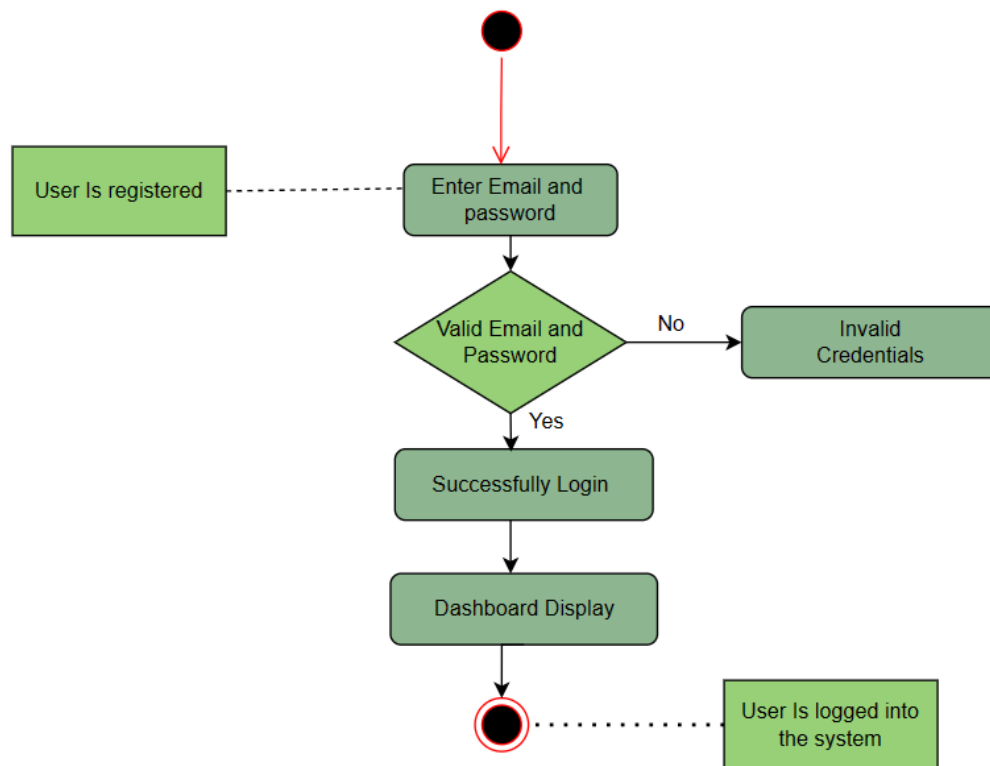
8.4.3 Forgot Password
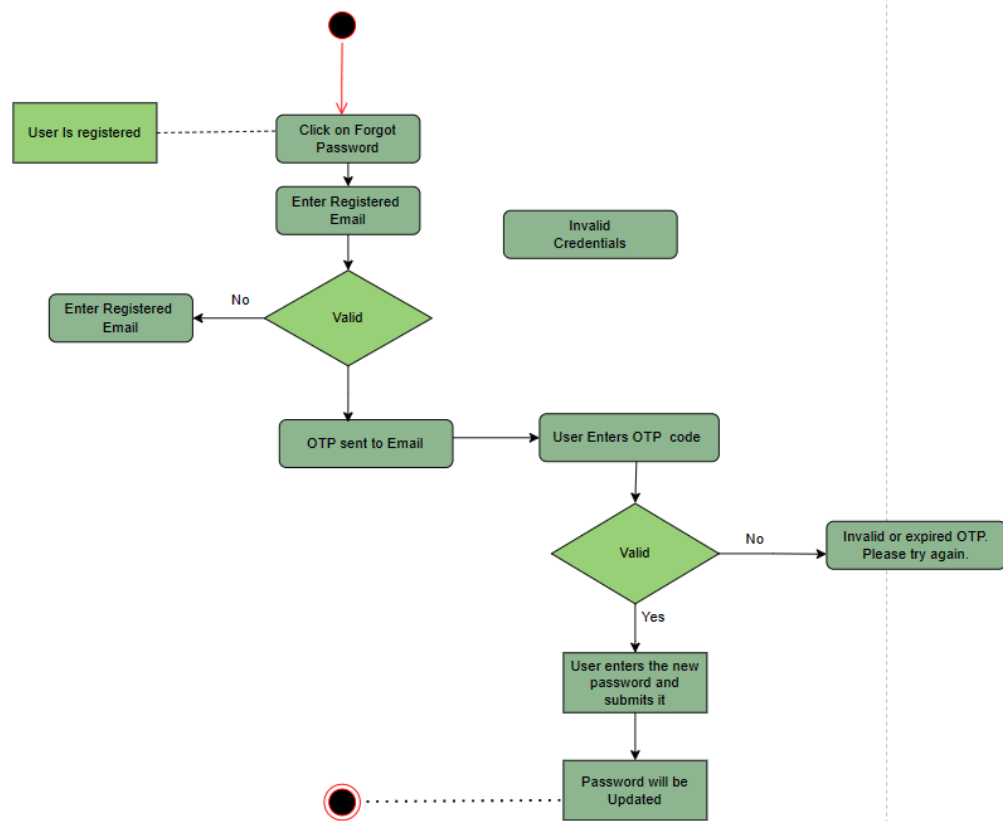
8.4.4 Filters
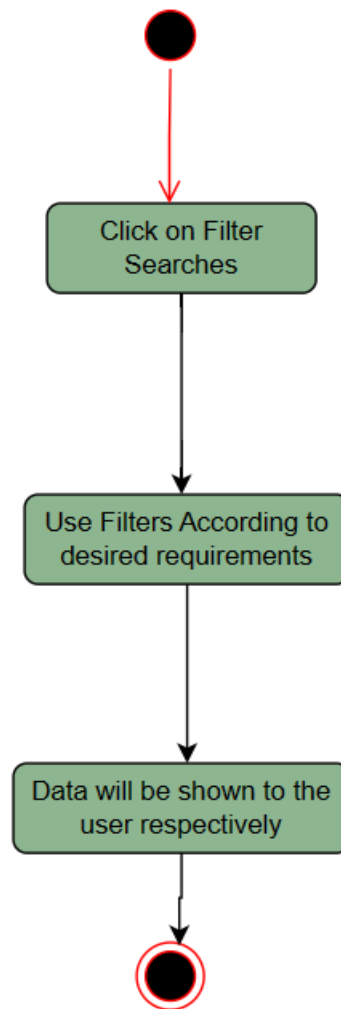
8.4.5 Booking
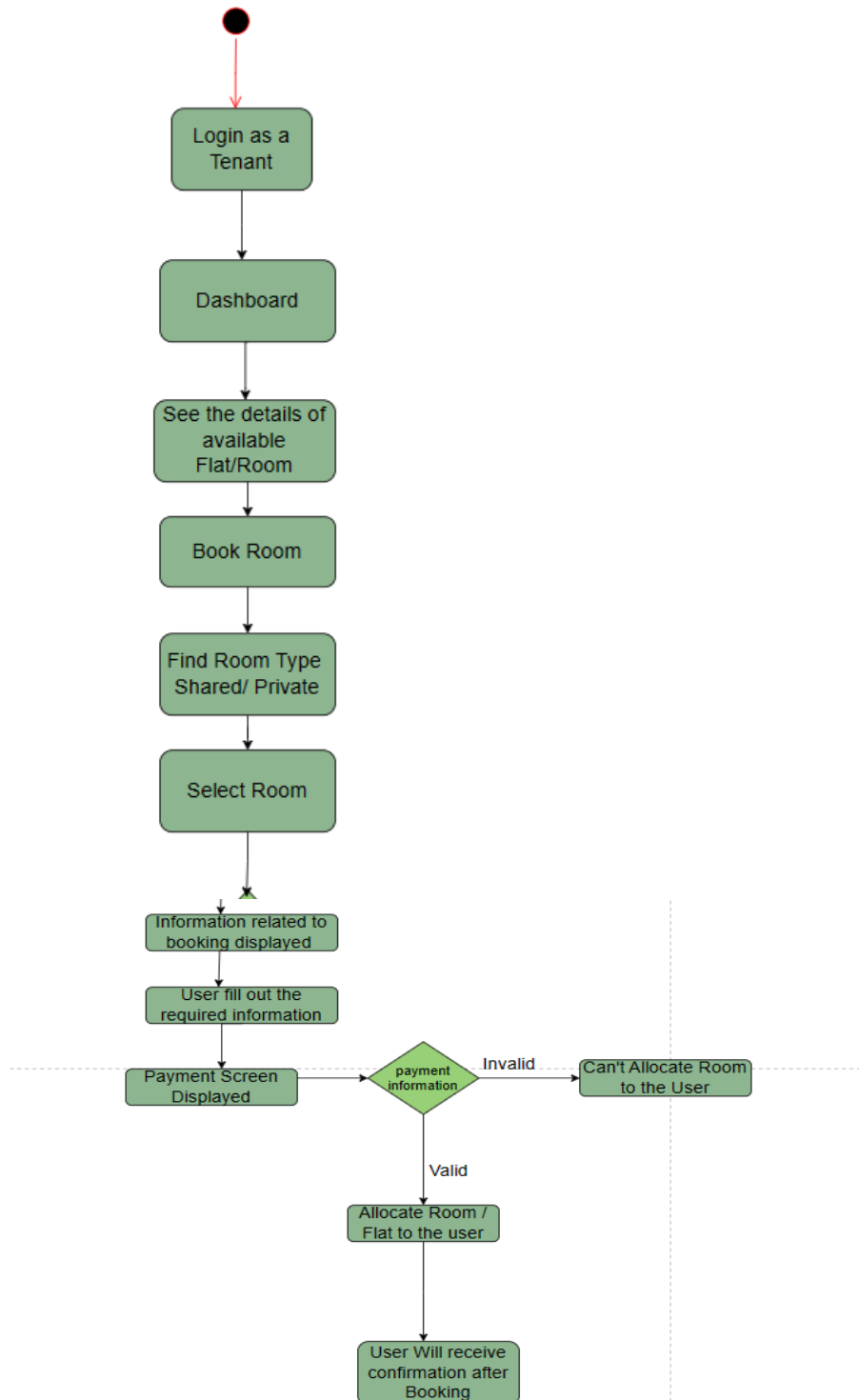
8.4.6 Booking History
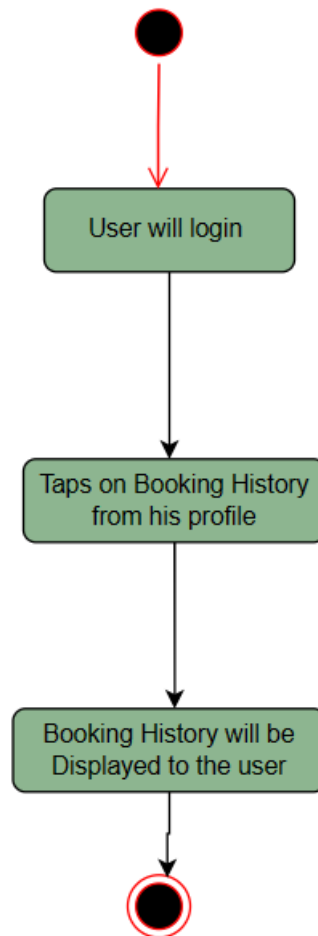
8.4.7 Cancel Booking
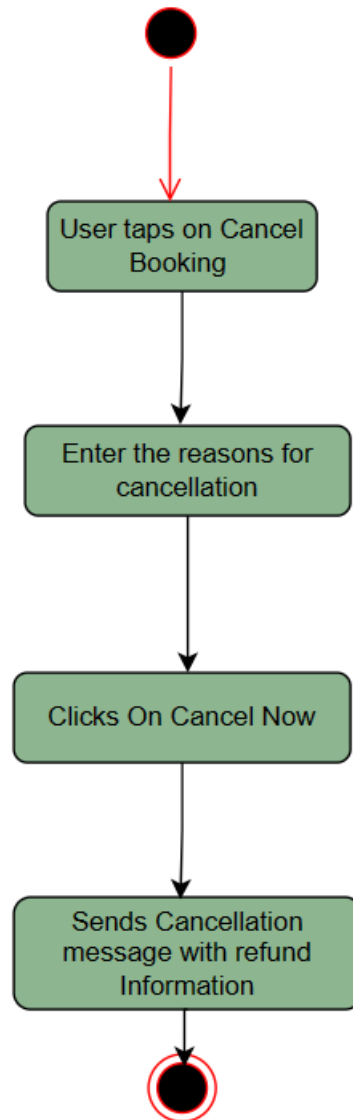
8.4.8 Chat
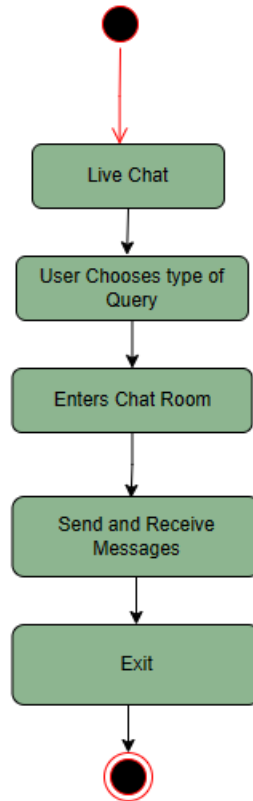
8.4.9 Lodge Complain
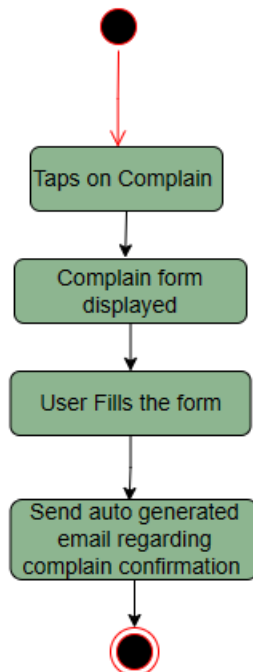
8.4.10 Create Property post
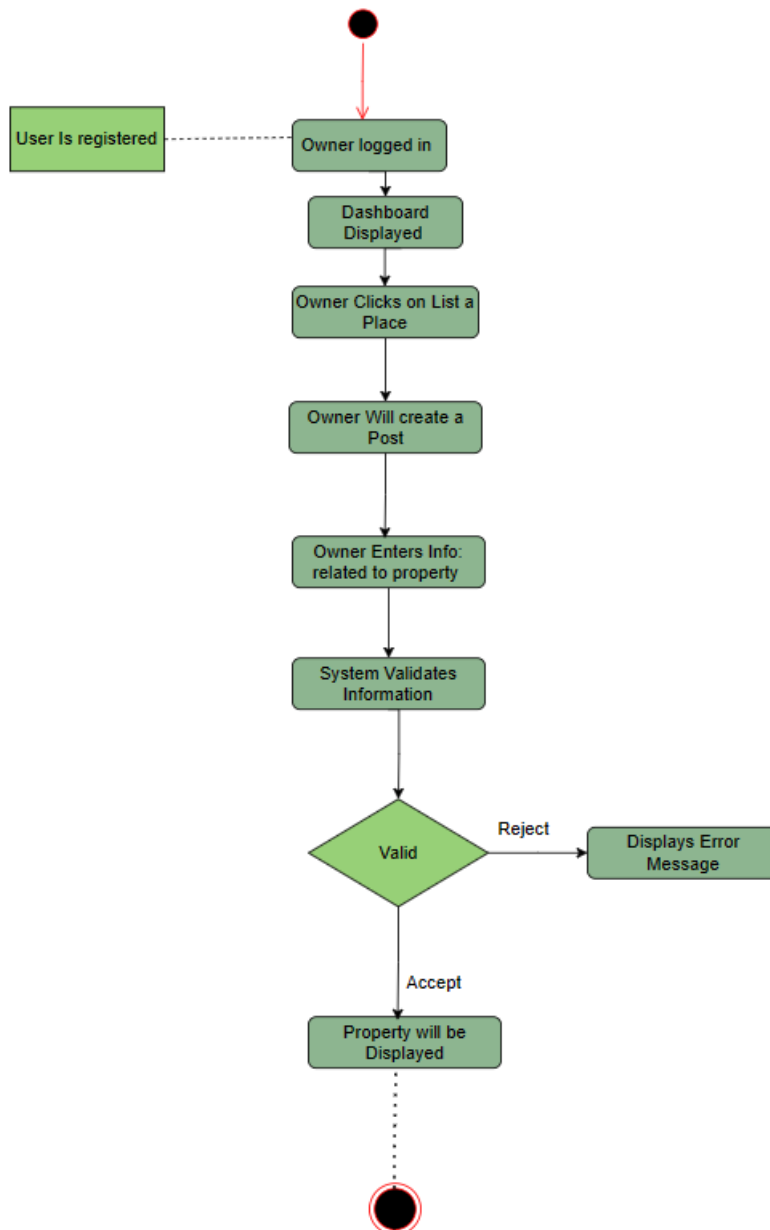
8.4.11 Edit Profile
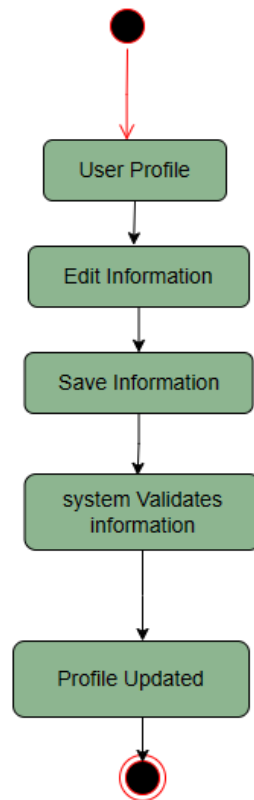
8.4.12 Request Visit
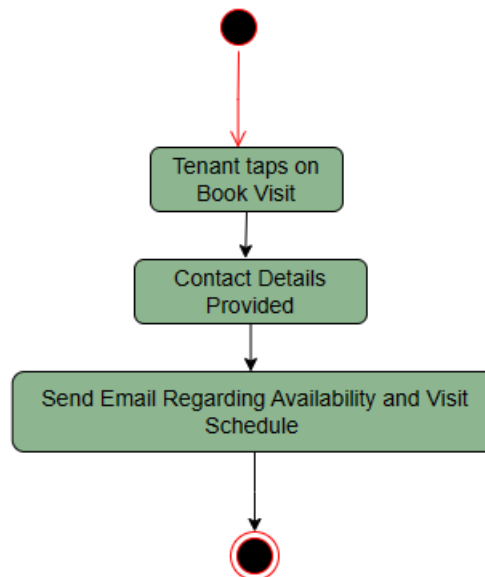
8.5 Sequence Diagram

8.5.1 Register
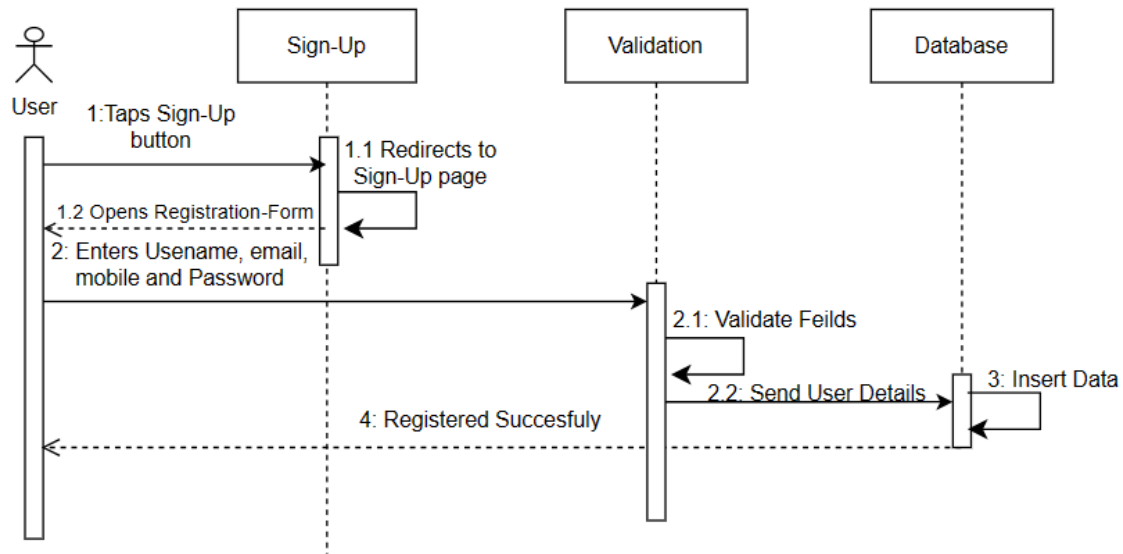
8.5.2 Login
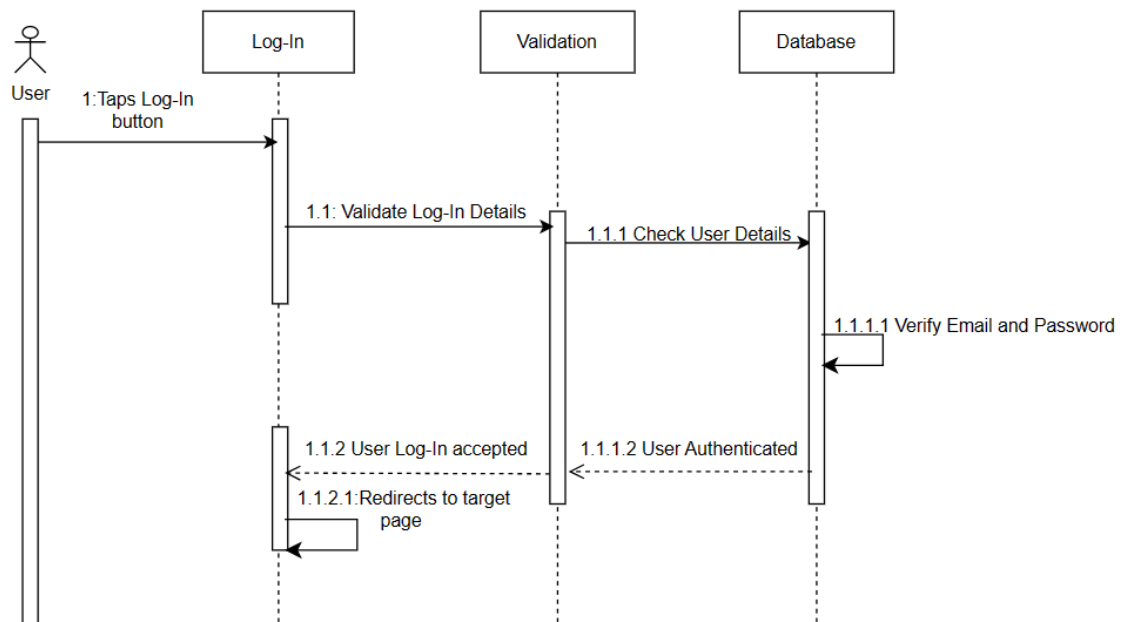
8.5.3 Edit Profile
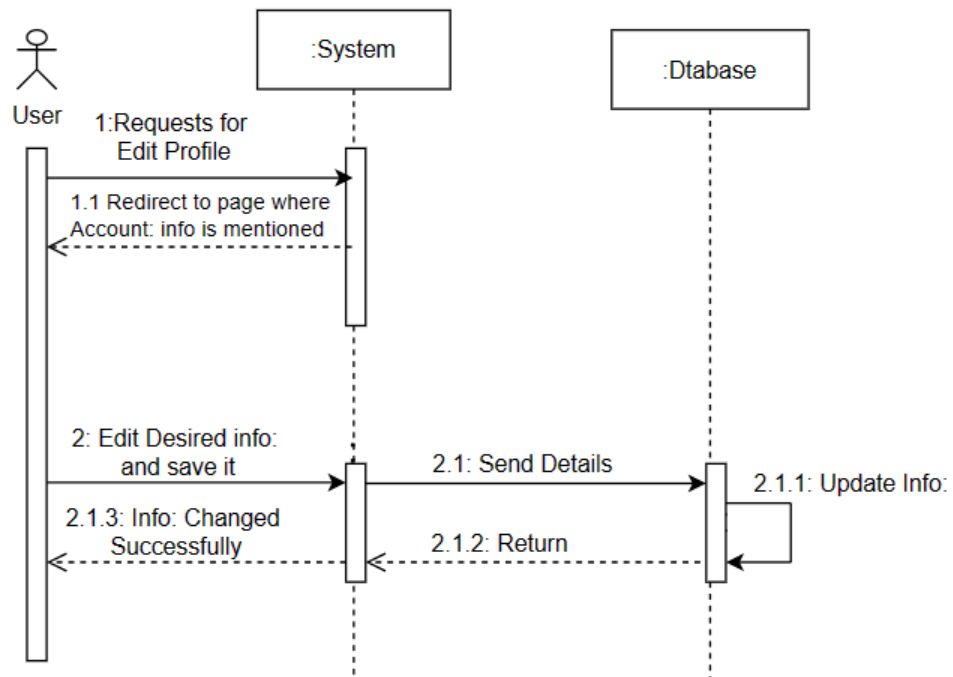
8.5.4 Reset Password
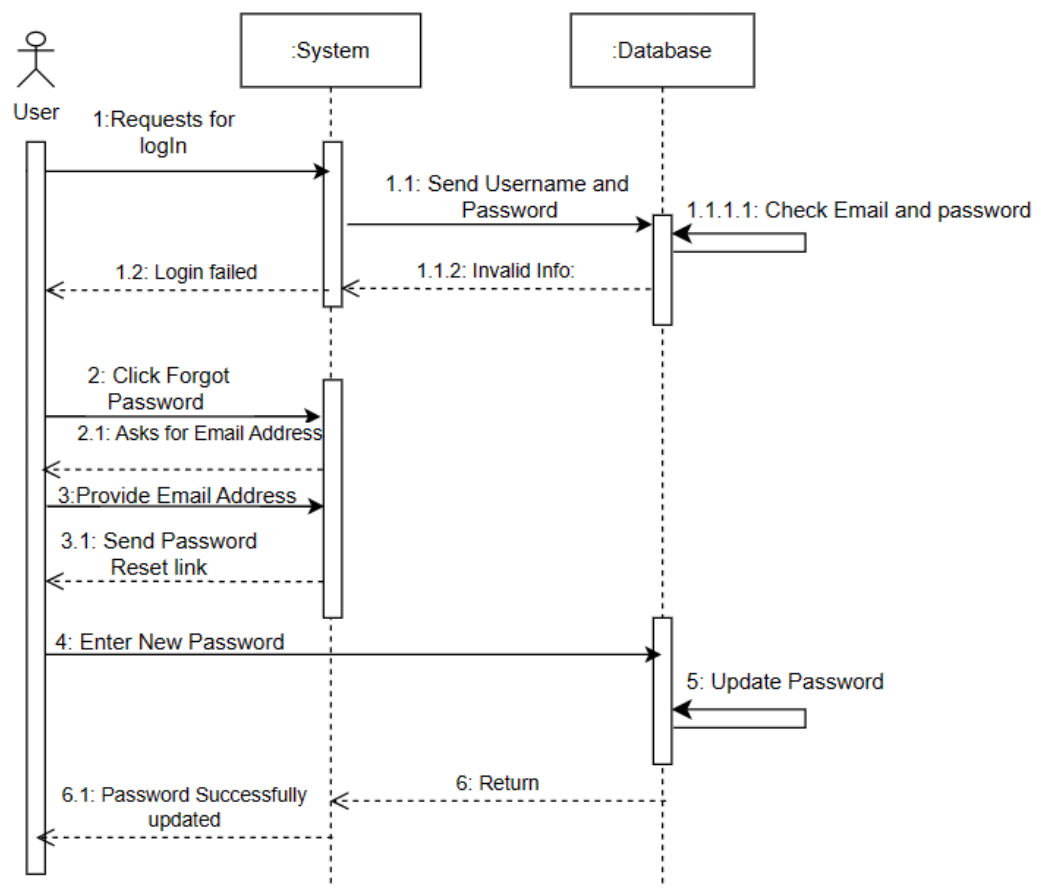
8.5.5 View History
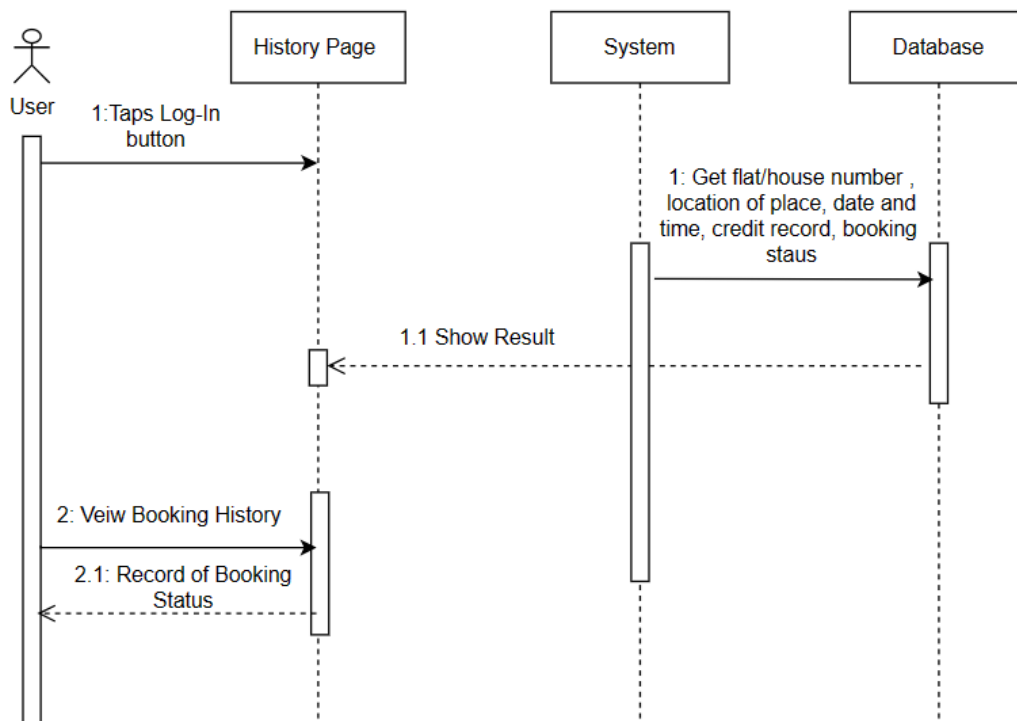
8.5.6   Filter Searches
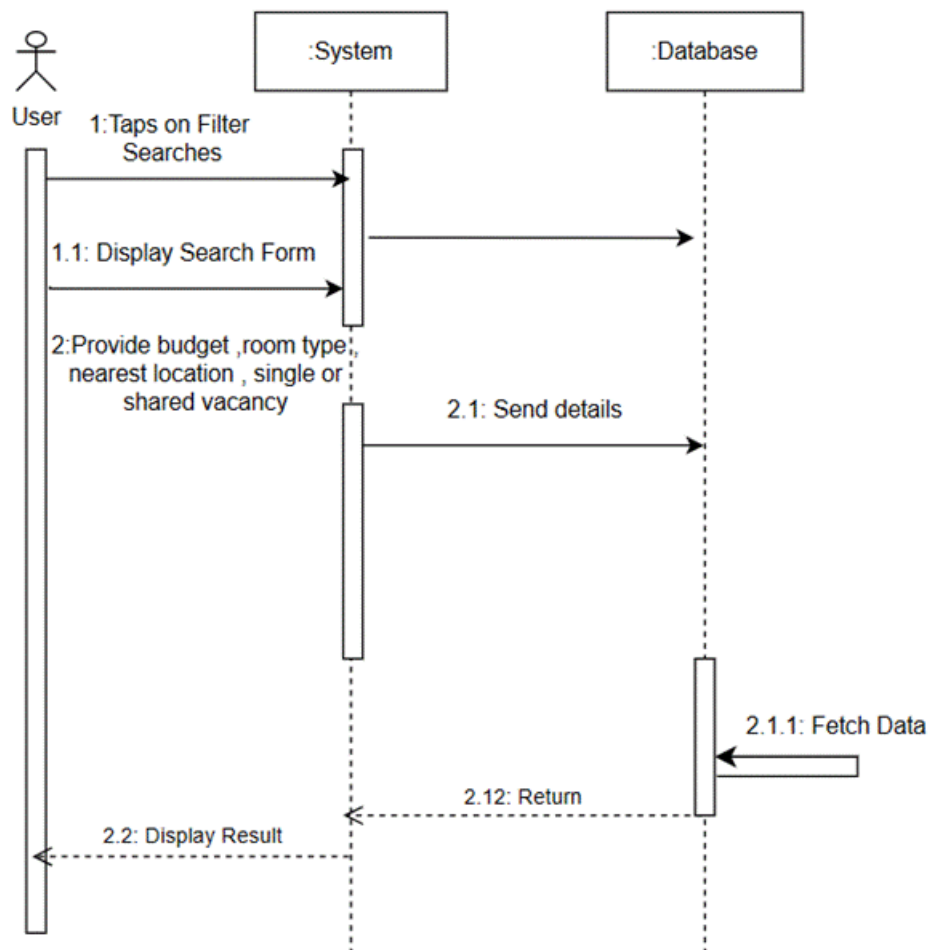
8.5.7 Post Adds
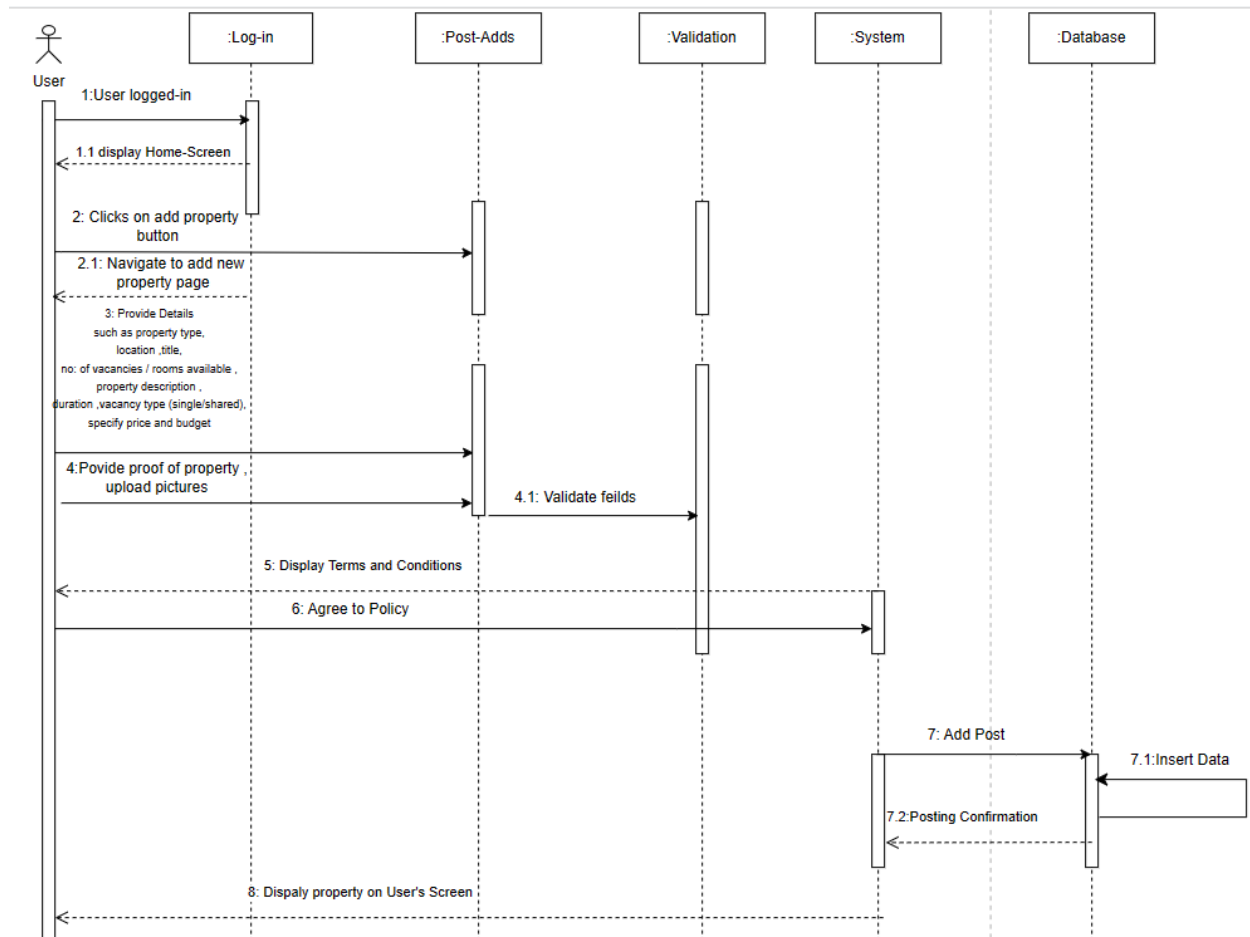
8.5.8 Request Visit
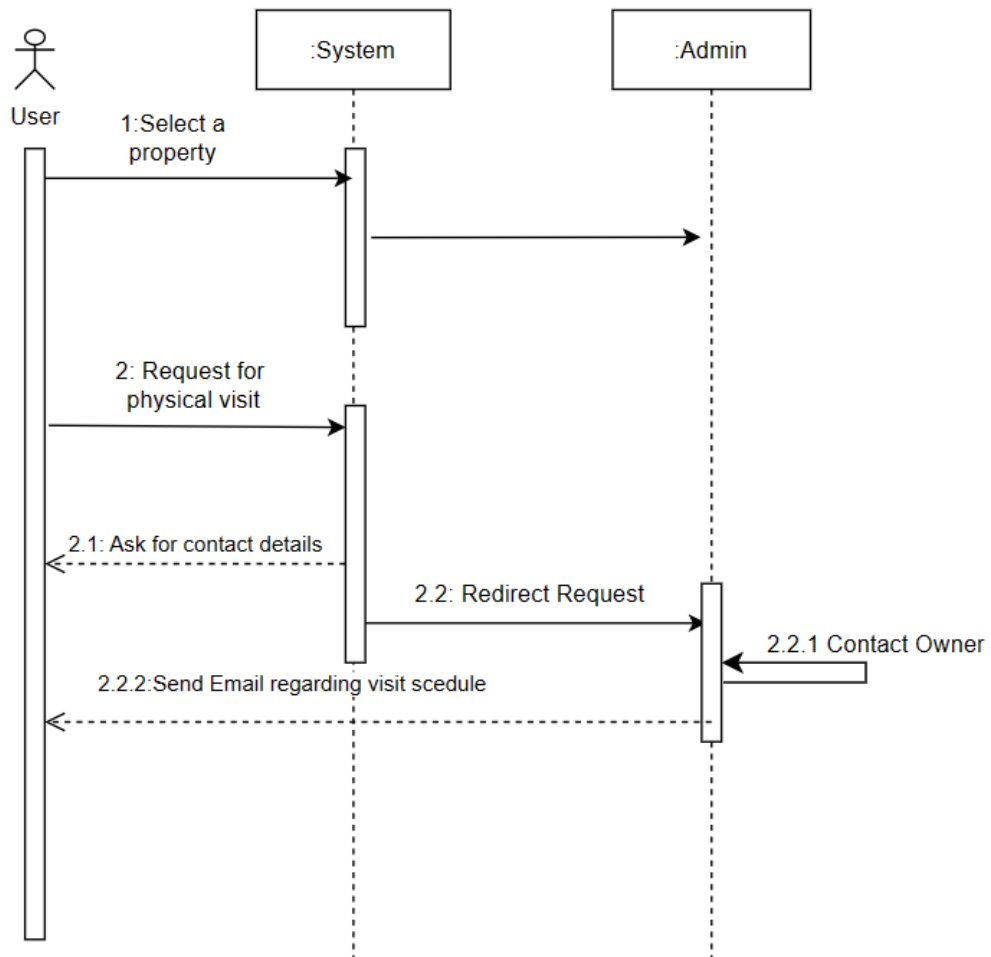
8.5.9 Booking
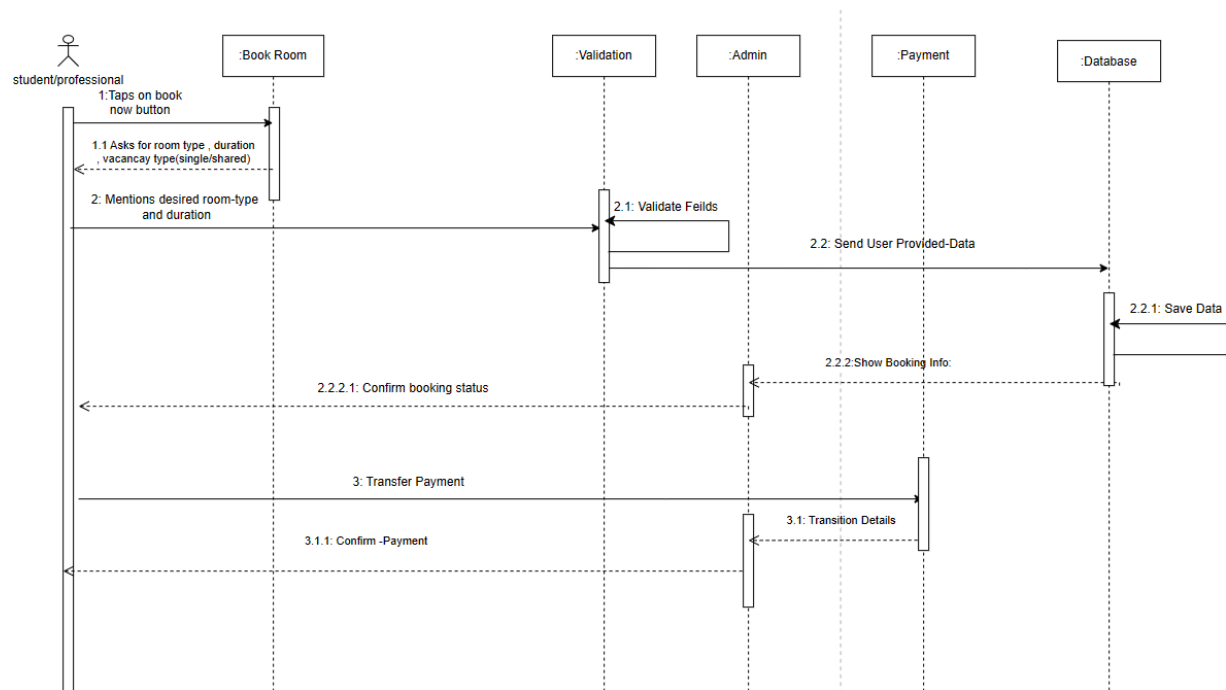
8.5.10 Cancel Booking
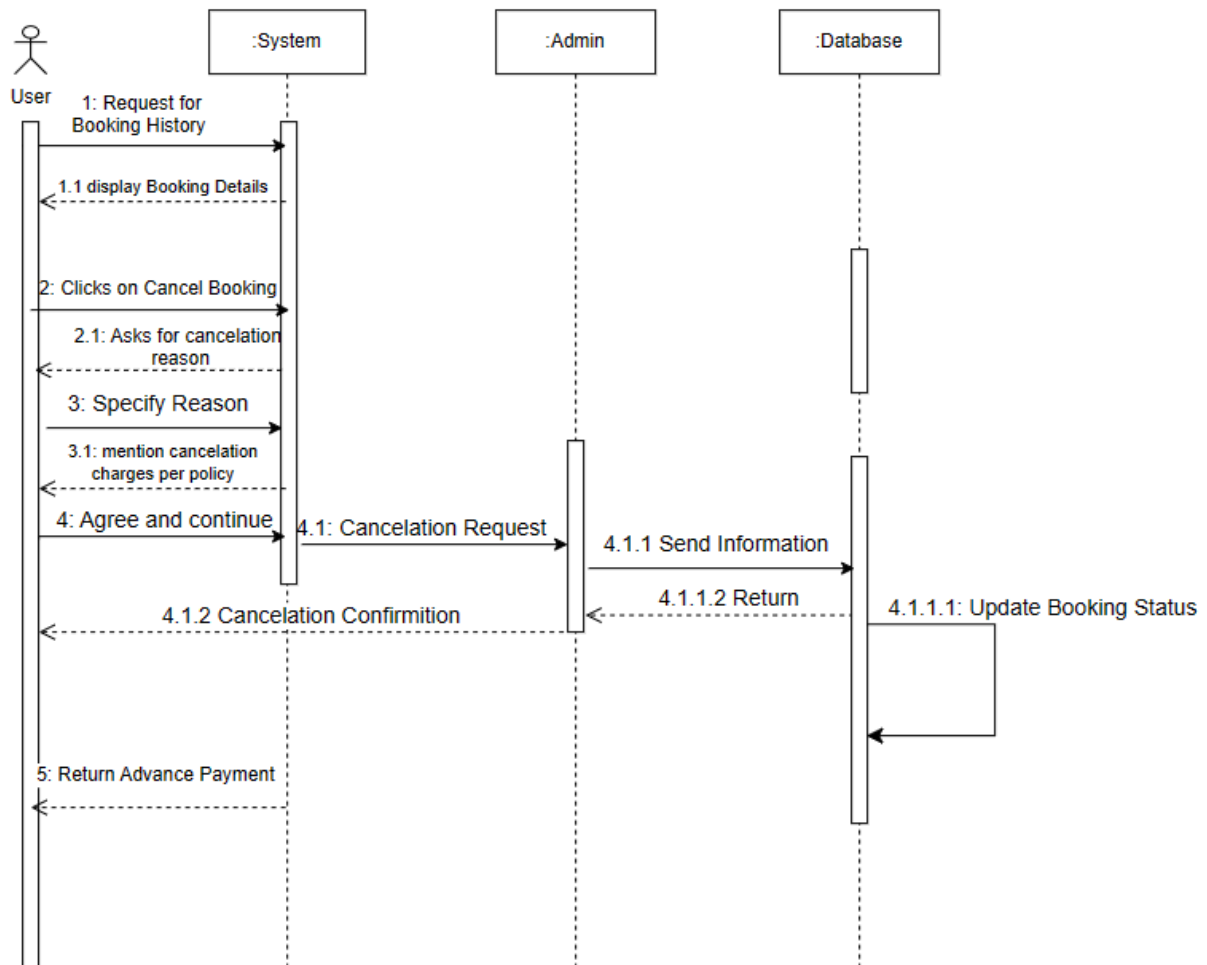
8.6 Collaboration Diagram

8.6.1 Register
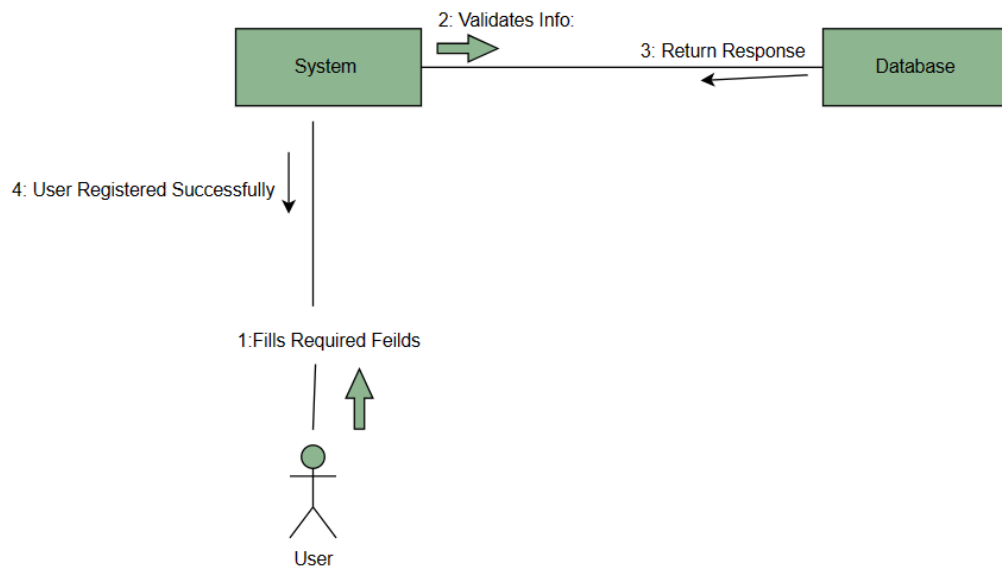
8.6.2 Login
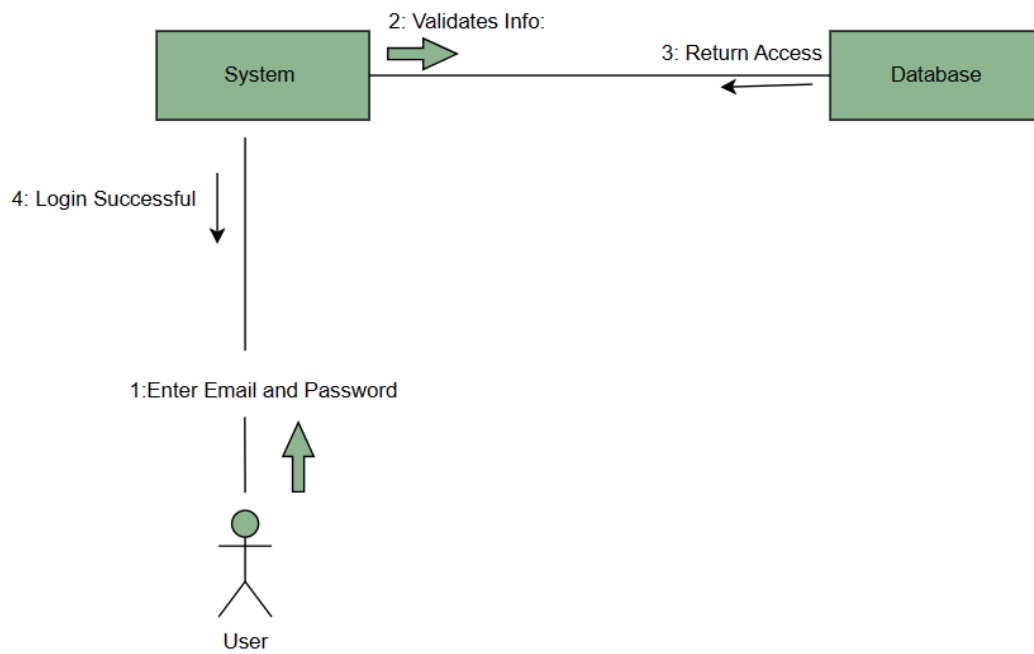
8.6.3 Post Adds
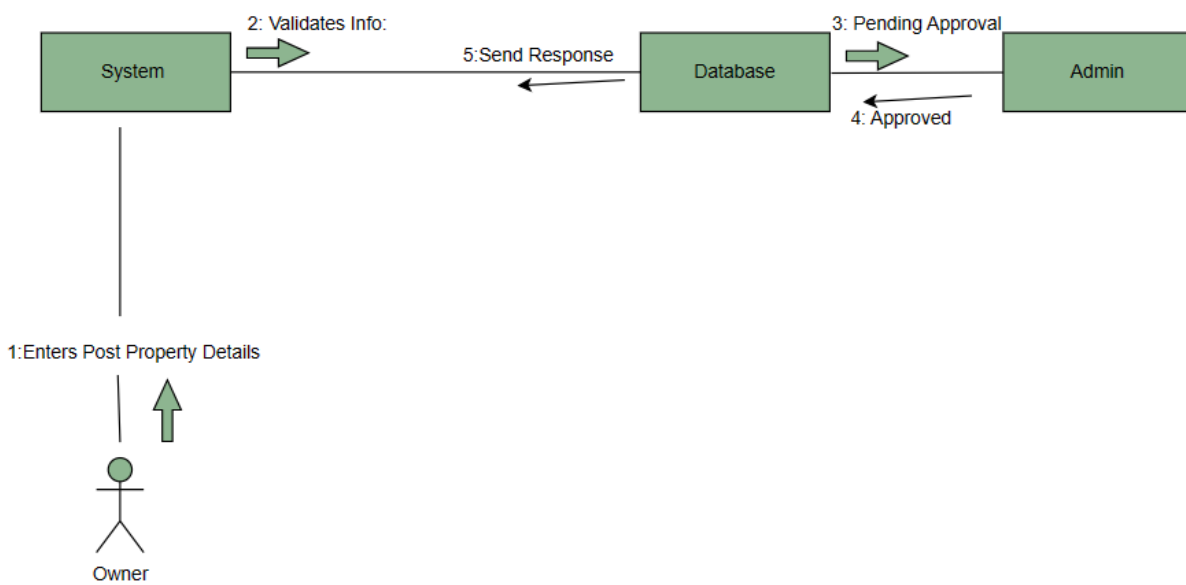
8.6.4 Booking

8.6.5 Update Password

2: Send Password

3:Update Password

System

Database

1: Clicks on Forget password and reset it

8.6.6 Cancel Booking

2: Send

3:Response

System

Database

4: Send Email with all the refund information

1: Taps on Cancel Booking

Tenant
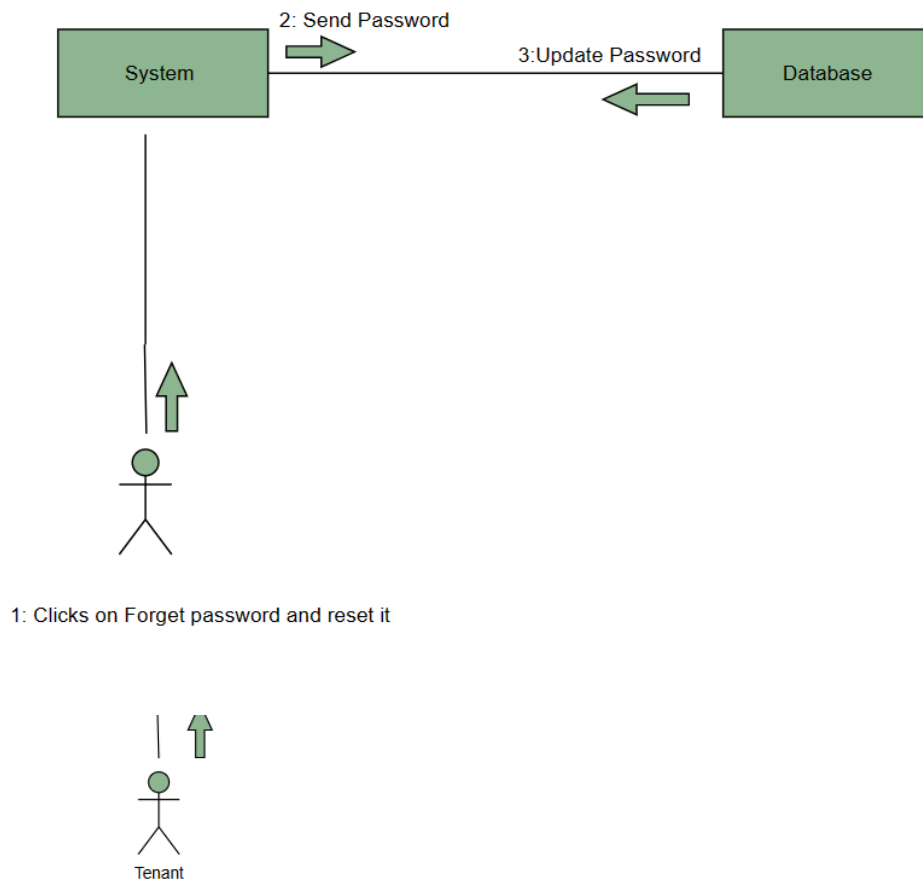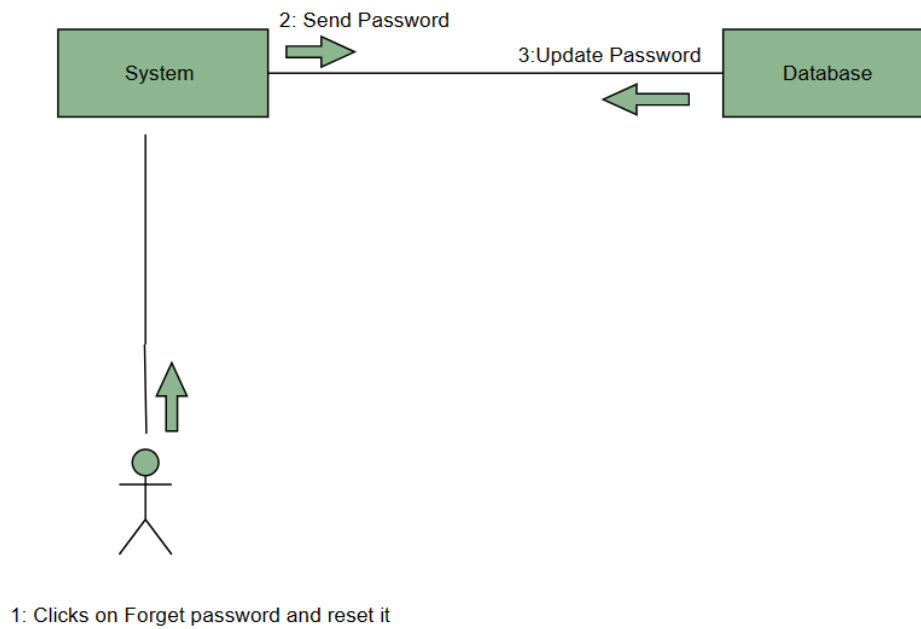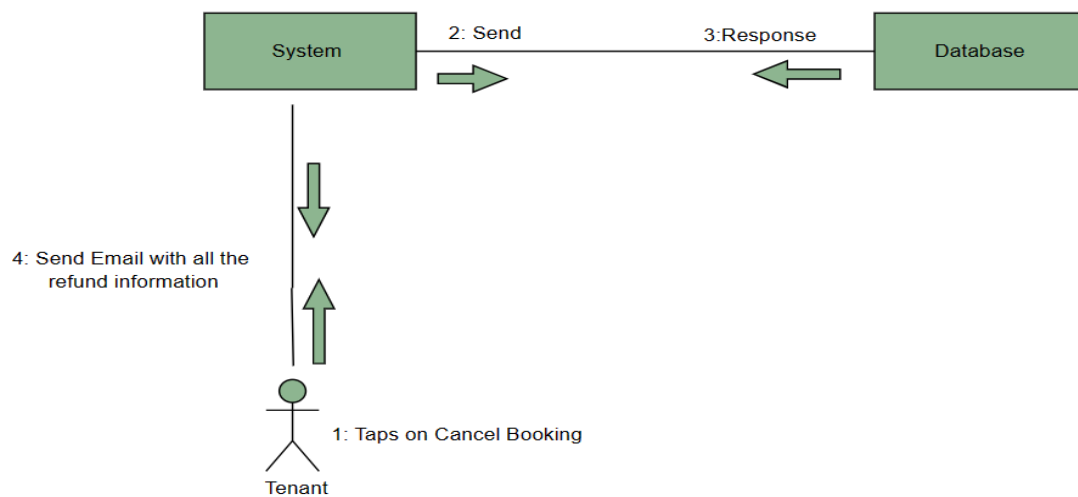
8.6.7 Lodge Complain
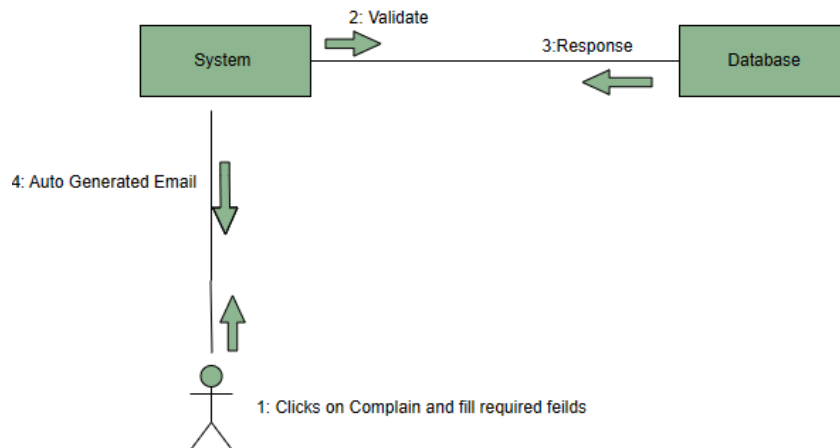
8.6.8 Filter
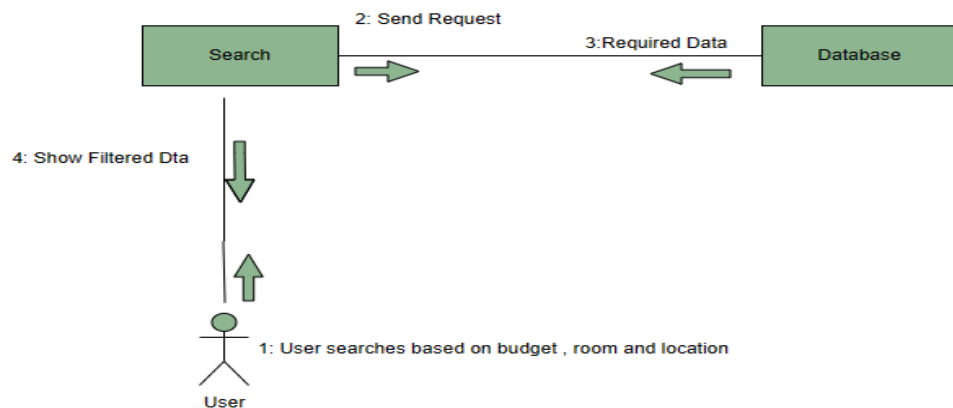
8.6.9 View Booking History
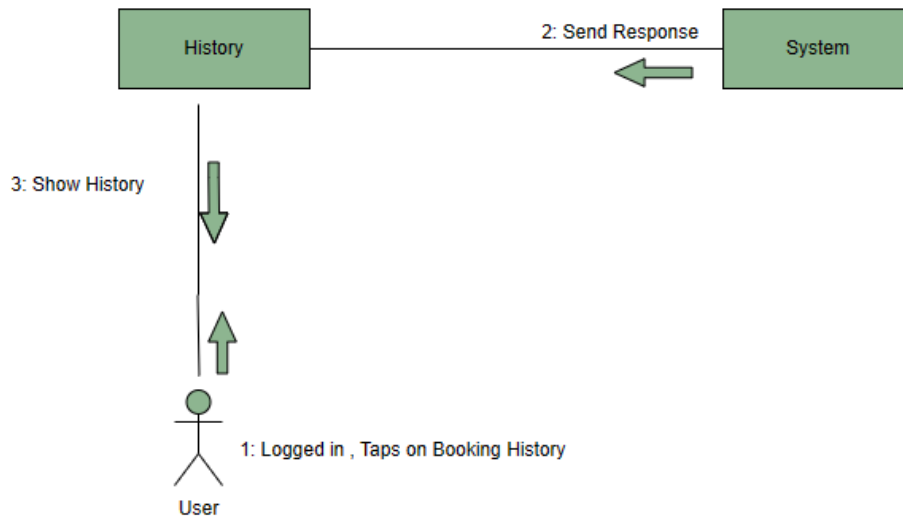
8.6.10 Edit Profile
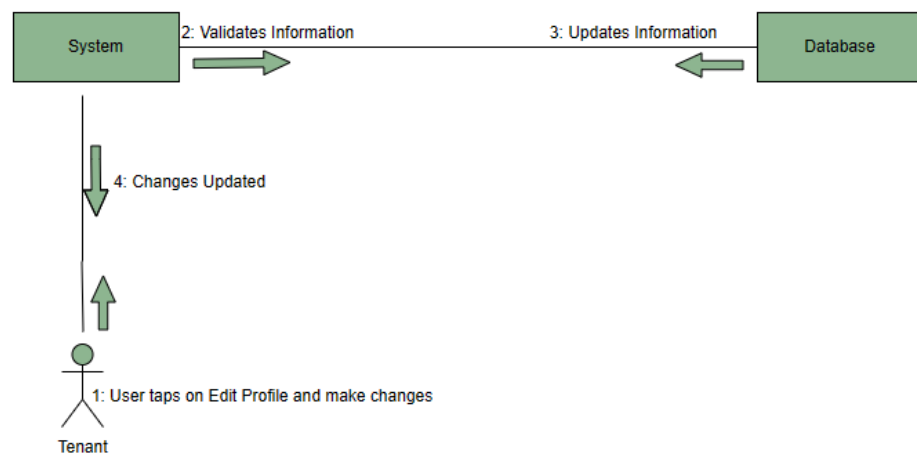
8.6.11 Place Query
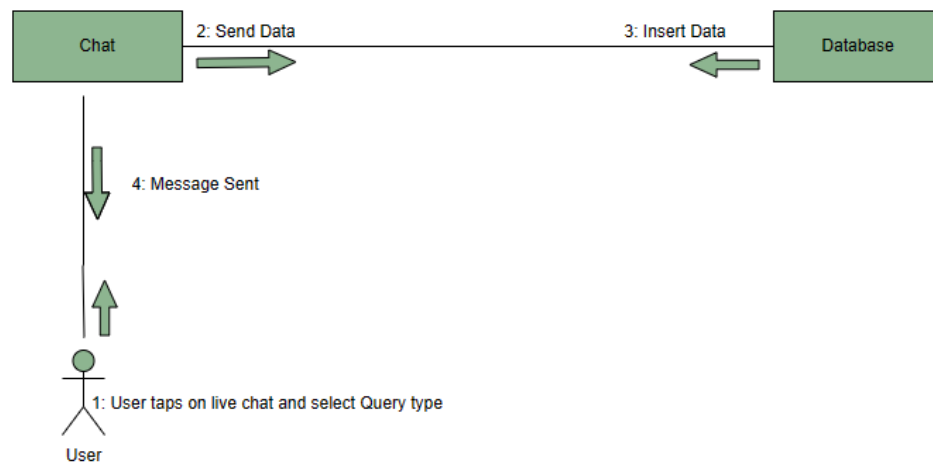
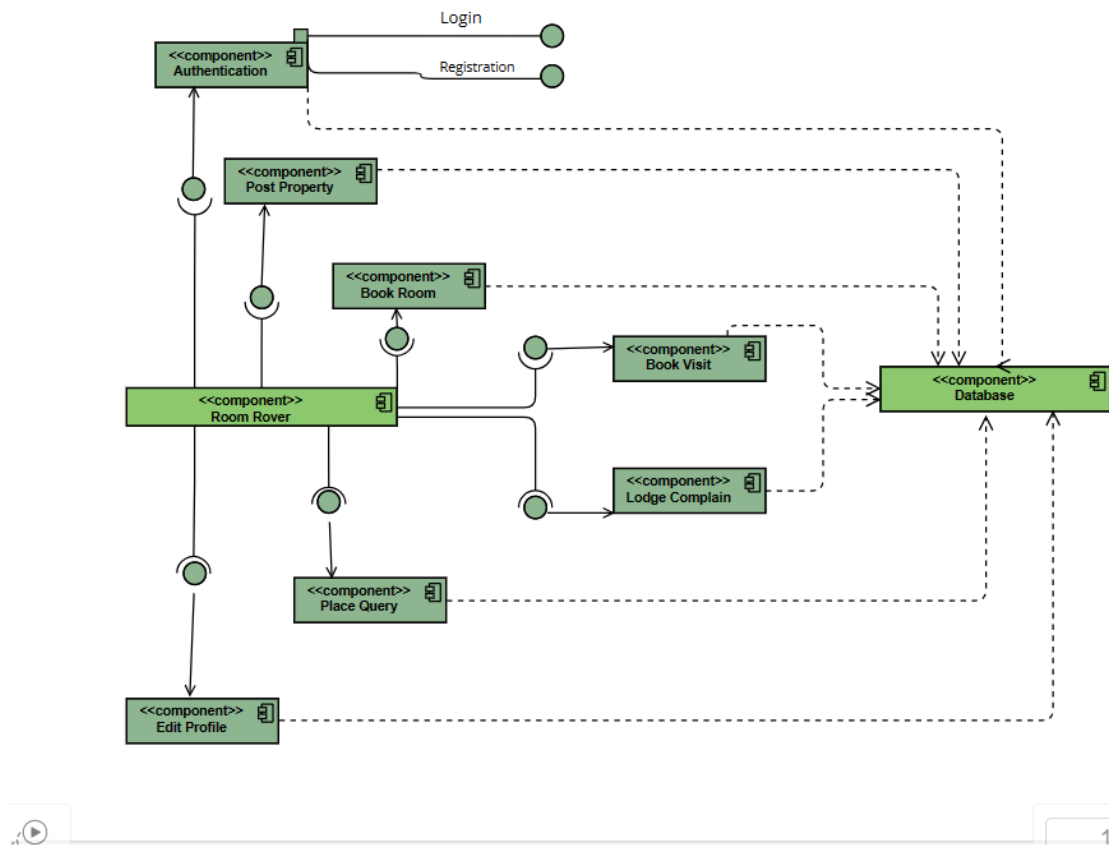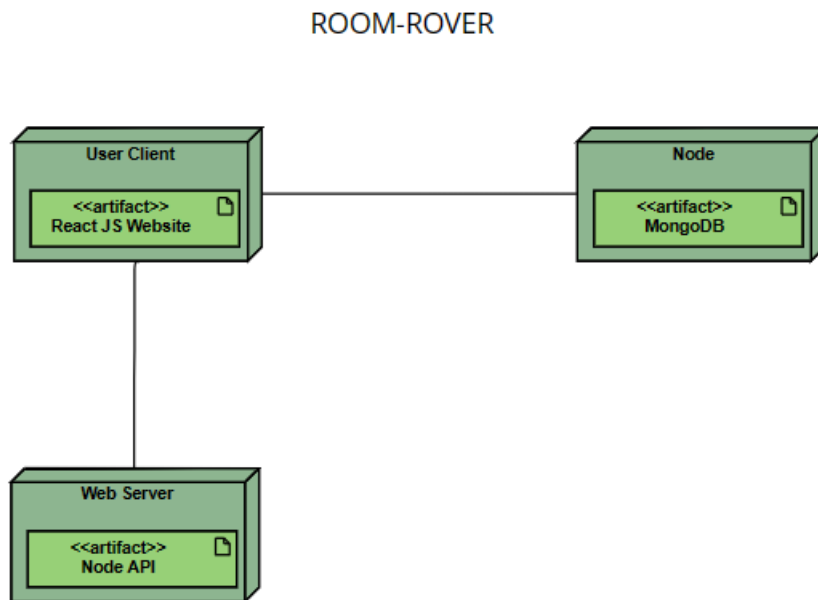# 8.7 Use Case Diagram

8.8 Component Diagram

8.9 Deployment Diagram

ROOM-ROVER

8.10 System Block Diagram