
Design Document

for

Homestay Booking Website Project

Version 1.0

Prepared by

Group 6

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REVISIONS

Version	Primary Author(s)	Description of Version	Date Completed
#1	Group 6	Initial Design Document	04/05/24

1. Introduction

1.1 Purpose

The purpose of this document is to provide a detailed architecture design of the Homestay Booking System by focusing on four key quality attributes: usability, availability, maintainability, and testability. This document will help the development team to determine how the system will be structured at the highest level. It is also intended for the project manager to sign off on the high-level structure before the team shifts into detailed design, and to validate that the development team is meeting the agreed-upon requirements during evaluation process.

1.2 Scope

This document will address the architecturally significant functional requirements as well as a prototype of the user interface design. Additionally, a class diagram and sequence diagram are provided for each use case. By addressing these aspects comprehensively, this document aims to provide stakeholders, including developers, designers, and project managers, with a clear understanding of the homestay booking website's design and functionality. It serves as a reference point throughout the development lifecycle, guiding decision-making and facilitating effective communication among project team members.

1.3 Definitions, Acronyms and Abbreviations

User refers to any individual who interacts with the homestay booking website.

Guest a user of the homestay booking website who seeks temporary accommodation in various locations.

Host a user who offers accommodation on the homestay booking website.

UI User Interface

1.4 References

Application Architecture Guide 2.0 patterns and practices. © 2008 Microsoft Corporation.

Retrieved from: http://fizyka.umk.pl/~jacek/docs/net/Application_Architecture_Guide_v2.pdf

Textbook: Software Engineering PEARSON Tenth Edition – Ian Sommerville.

Architecture model, use case diagram templates provided by teaching assistant.

2. Architectural Design

2.1 Overview

This figure shows a high-level overview of the system's architecture. Further details on the system components and their interactions will be explained in detail in the following sections.

Overall, the sections of the application design can be thought of as four basic sets of services:

- **Presentation services:** These are the user-oriented services responsible for managing user interaction with the system, and generally consist of components located within the presentation layer. They provide a common bridge into the core business logic encapsulated in the business services.
- **Application services:** These services handle the presentation layer requests, transformation of disparate data for presentation and serve as the controller component.
- **Business services:** These services implement the core functionality of the system and encapsulate the relevant business logic. They generally consist of components located within the business layer, which may expose service interfaces that other callers can use.
- **Data services:** These services provide access to data that is hosted within the boundaries of the system, and data exposed by other back-end systems; perhaps accessed through services. The data layer exposes data to the business layer through generic interfaces designed to be convenient for use by business services. This layer implements the communication with the data source (in this case, a database).

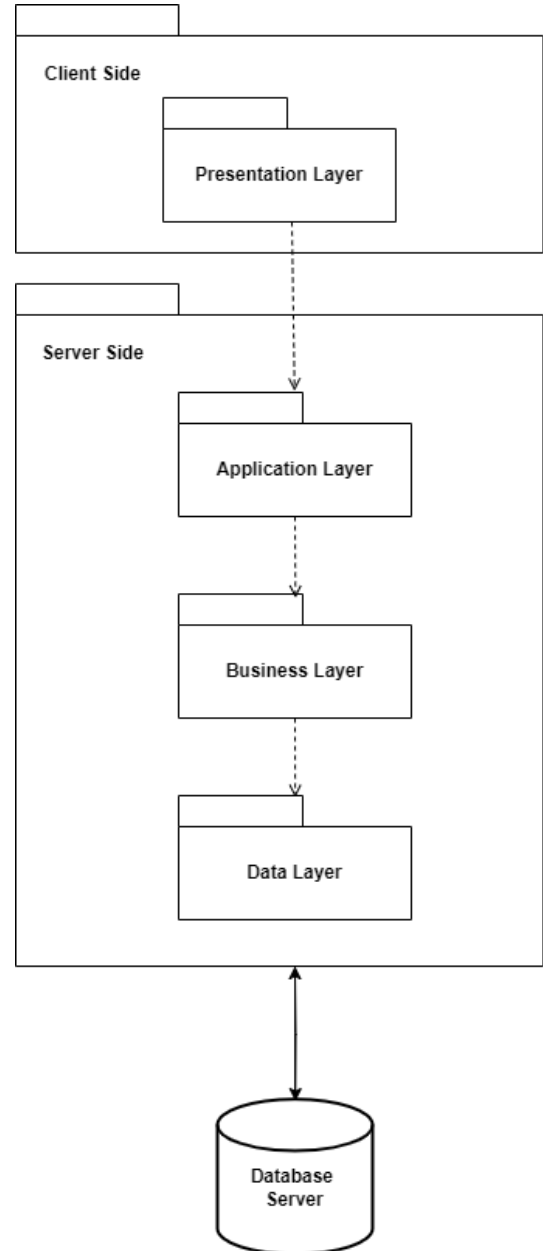


Figure 1. Architecture overview

2.2 Architectural Details

2.2.1 Presentation Layer Components

Presentation layer components implement the functionality required to allow users to interact with the application. In our Homestay Booking System, these components are separated into two types:

- **User interface (UI) components.** These components provide the mechanism for users to interact with the application. They format data and render it for display, acquire and validate data entered by user. Specifically, they are React components such as header, search bar, pop-up messages, etc.

HOMESTAY BOOKING WEBSITE PROJECT

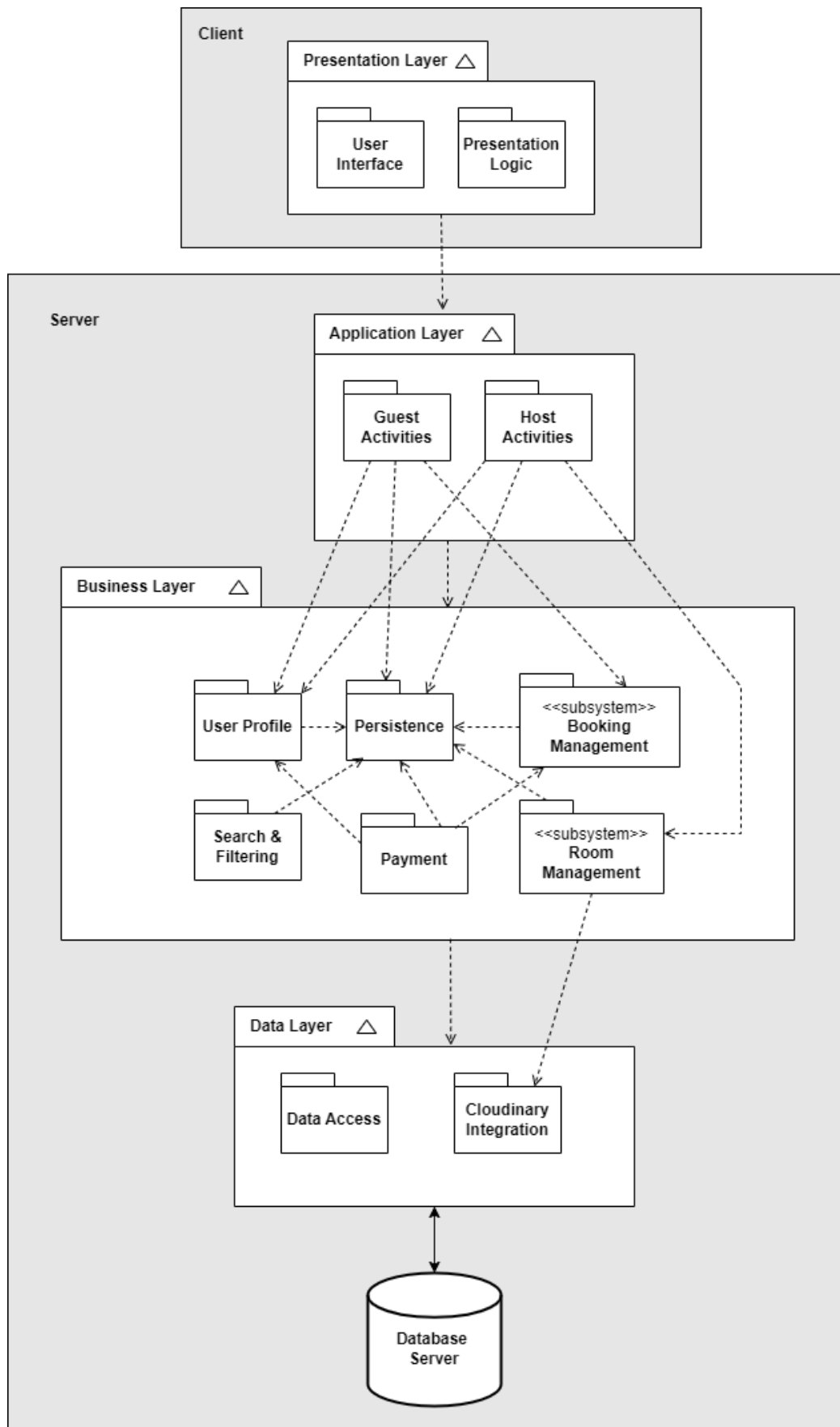


Figure 2. Architectural model

- **Presentation Logic components.** They are responsible for managing the user interface and controlling how data is presented to the user. These components handle tasks such as managing the state of UI elements and responding to user interactions. Within the homestay booking system, we also leverage caching mechanisms to optimize room lookups and avoid network round trips.

2.2.2 Application Layer Components

By placing guest and host activities in this layer, we separate the concerns of managing user interactions and business rules from other layers as they represent different sets of functionalities available to users acting as guests and hosts within the Homestay Booking System.

- Both guest and host activities rely on **User Profile** in the Business Layer for managing user information, preferences, and authentication. They have common user management functionalities, such as registration, login, profile editing.
- Both guest and host activities depend on **Persistence** component in the Business Layer for storing and retrieving data from the database.
- Guest activities rely on the **Booking Management** subsystem for functionalities such as searching for available rooms, making reservations, and managing bookings.
- Host activities depend on the **Room Management** subsystem for functionalities such as listing properties, managing room availability, editing room, viewing guests' bookings.

2.2.3 Business Layer Components

- The **Payment** component handles payment processing for homestay booking (in our project, this is done through Stripe). It interacts with both **User Profile** component to retrieve user payment information and the **Booking Management** component to associate payments with specific bookings.
- The **Search & Filtering** component enables users to search for rooms based on criteria such as location, dates, number of guests.
- All components in this layer interacts with **Persistence** component to ensure that each component can access and manipulate data stored in the database efficiently.
- **Room Management** subsystem is responsible for managing room inventory, including descriptions, amenities, and images. **Integrating with Cloudinary** in the Data Layer allows system to store room images and media assets in the cloud, providing a centralized and scalable solution for managing and serving media content.

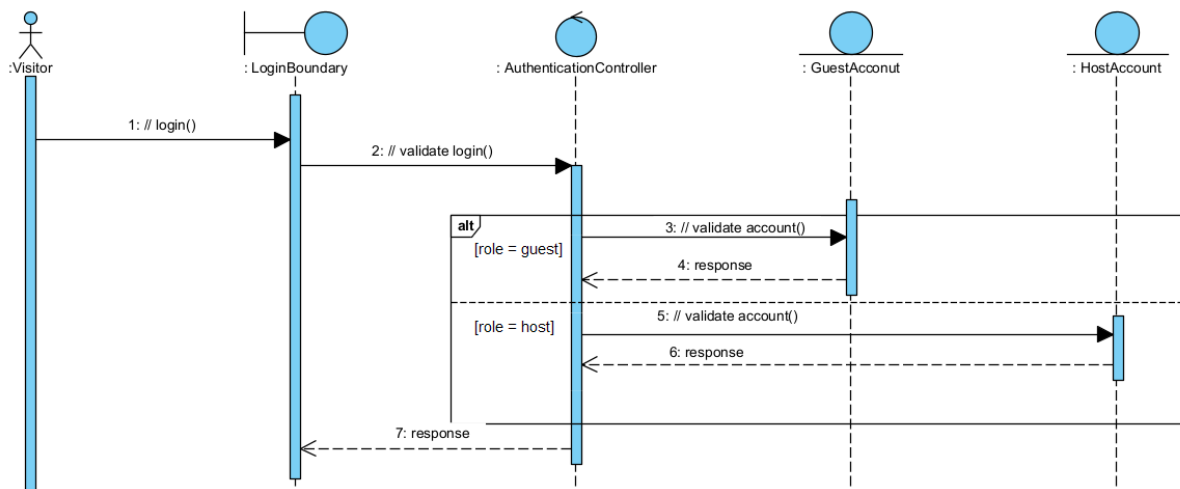
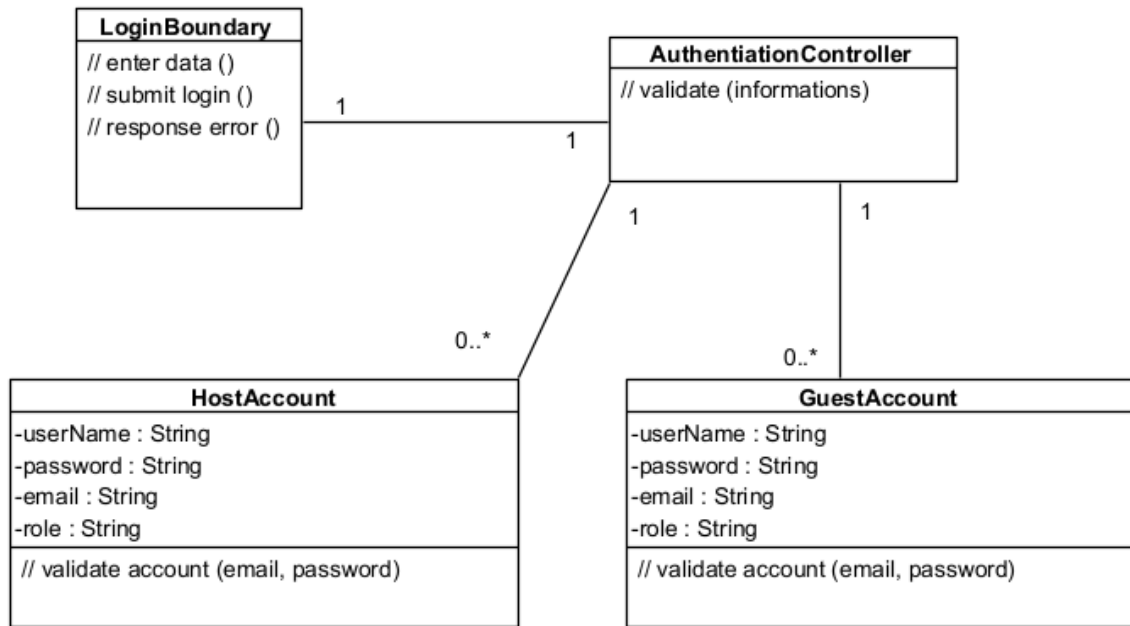
2.2.4 Data Layer Components

- The **Data Access** component is responsible for handling interactions with the database, providing a set of interfaces, methods, or classes that abstract the details of data storage and retrieval operations, allowing other components in higher layers to interact with the database without needing to know the underlying implementation details. It includes functionalities such as: connecting to the database, executing queries, inserting – updating – deleting data.
- **Cloudinary Integration**, as mentioned before, is a cloud-based media management platform that manages host's images, directly involves in the process of adding room which belongs to **Room Management** subsystem.

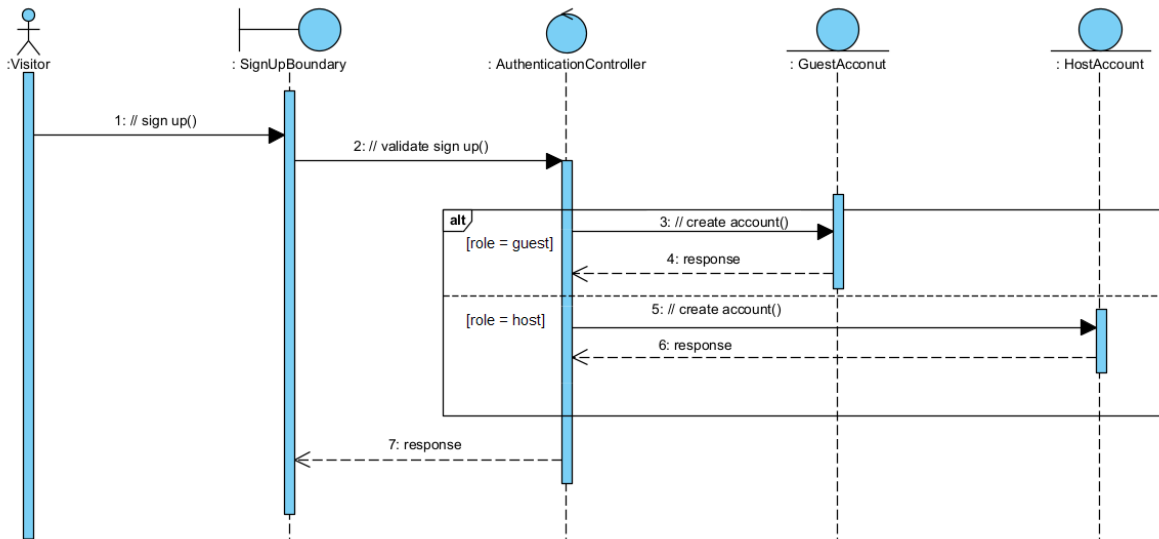
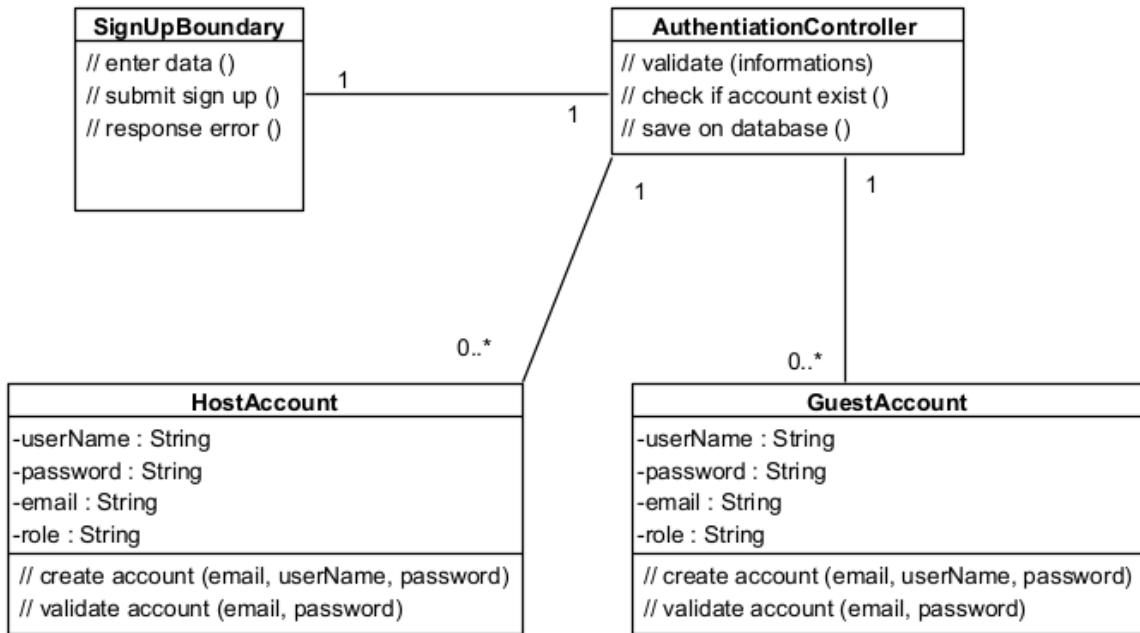
Figure 2 illustrates components of each layer and the dependencies between them.

2.3 Use Case Diagrams

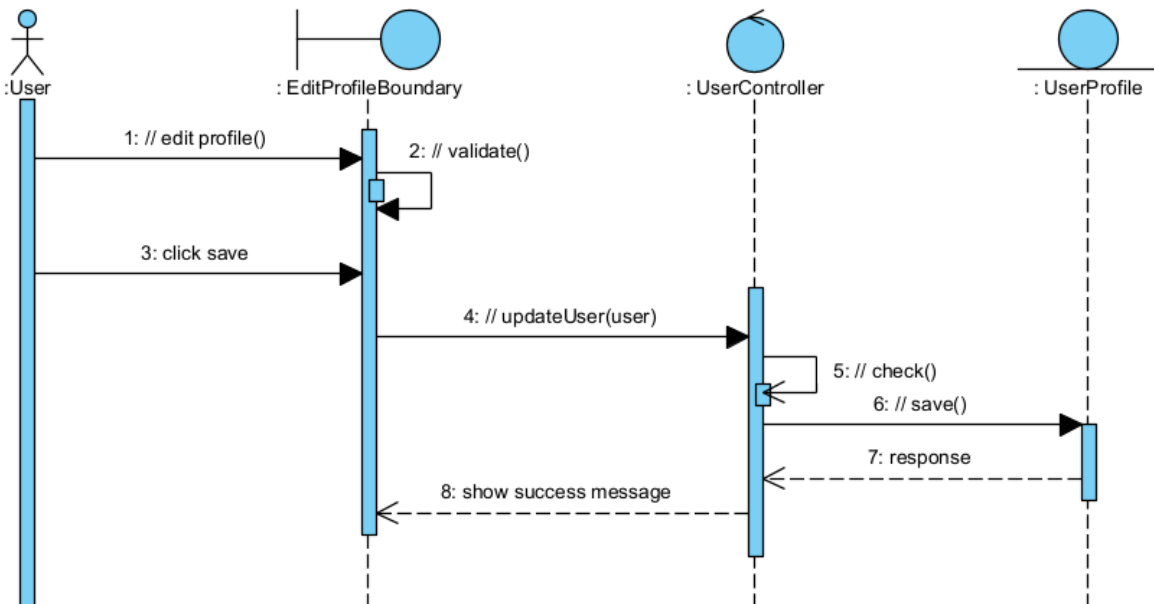
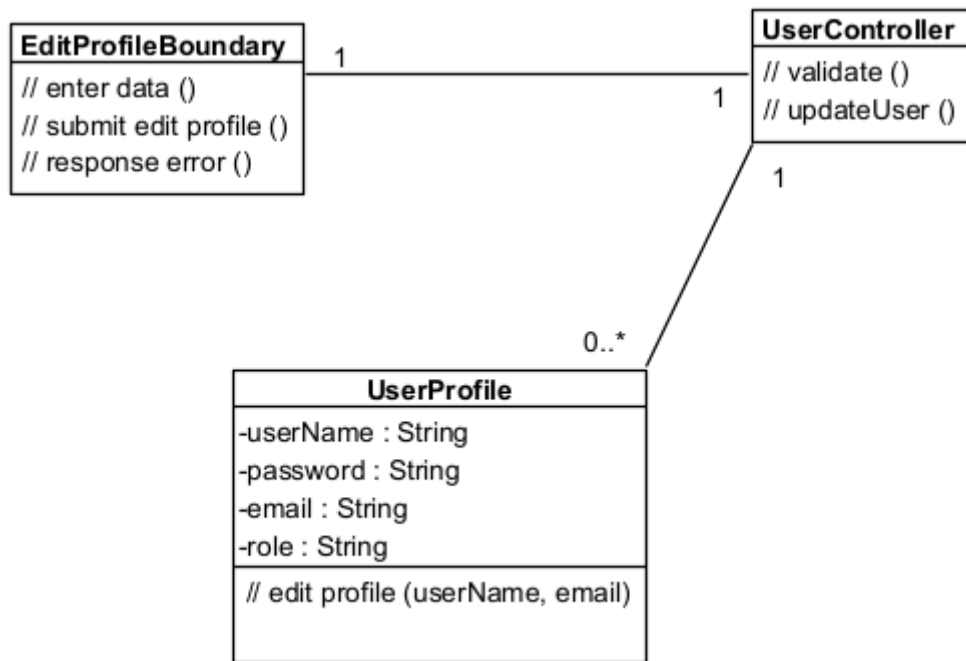
2.3.1 Login



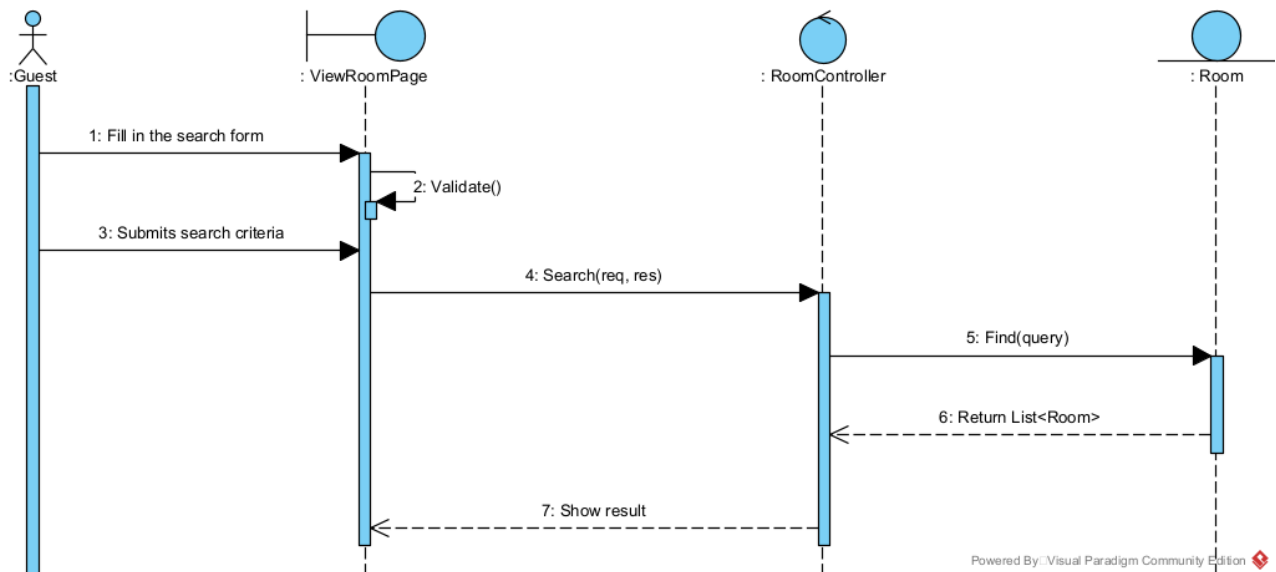
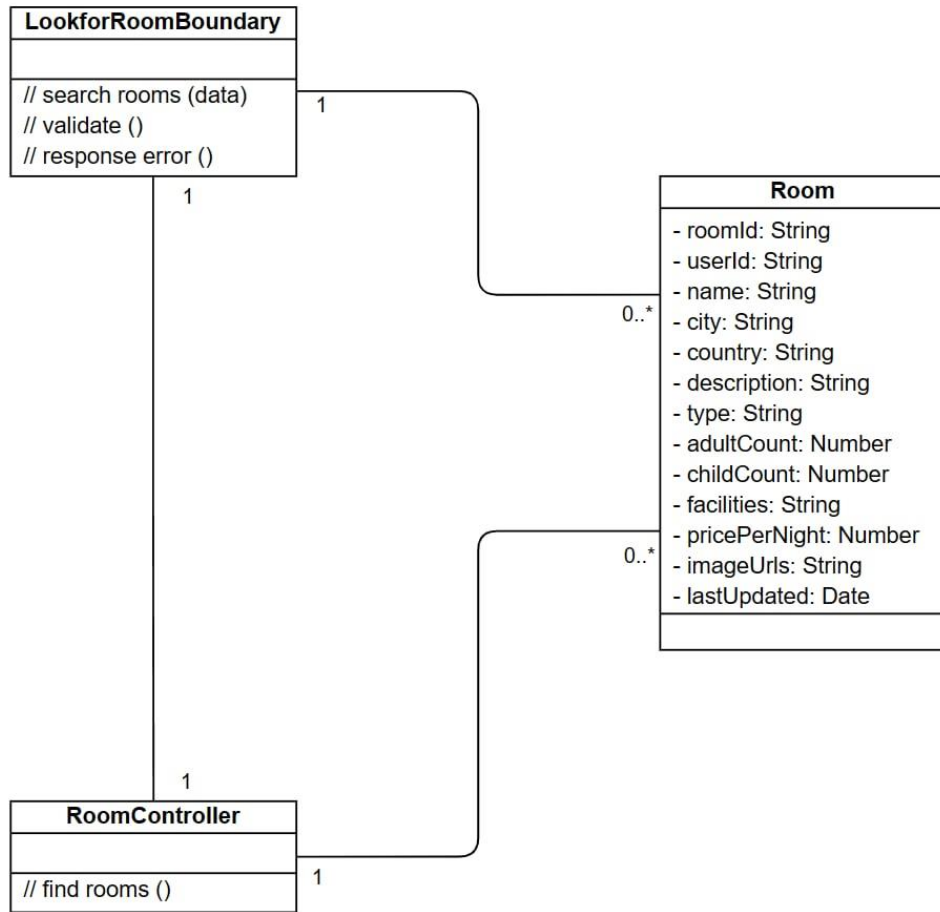
2.3.2 Register



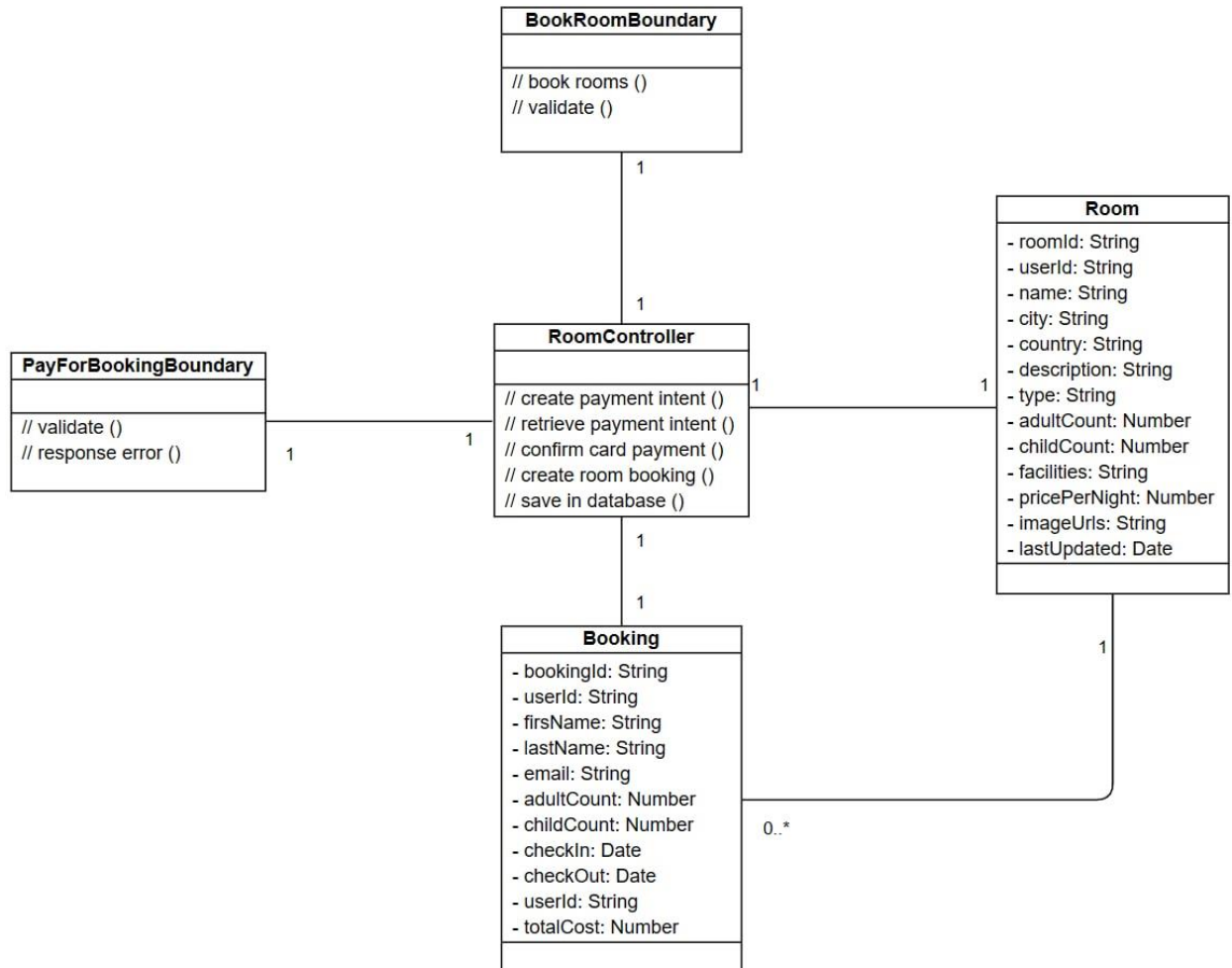
2.3.3 Edit Profile



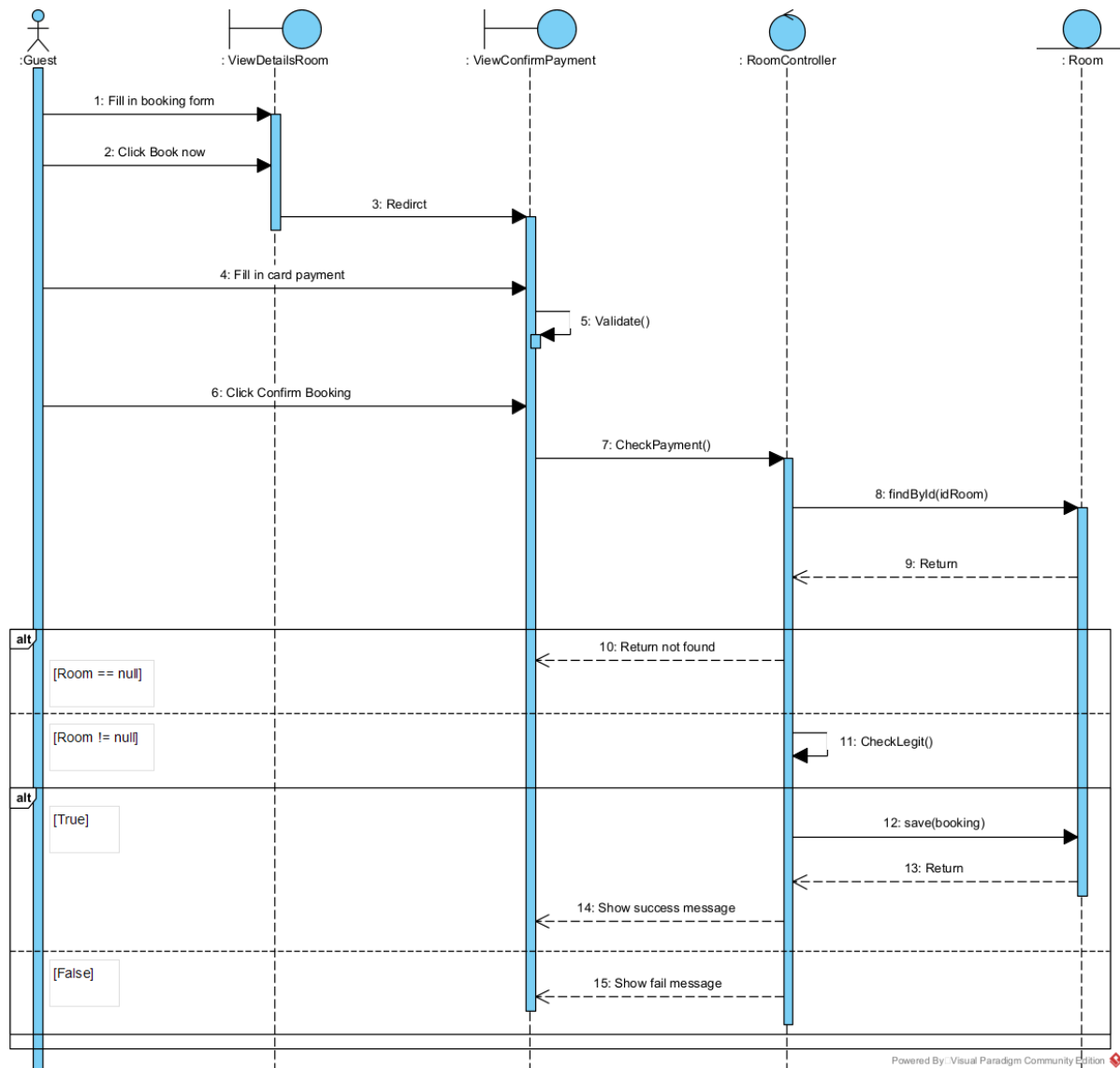
2.3.4 Search Room



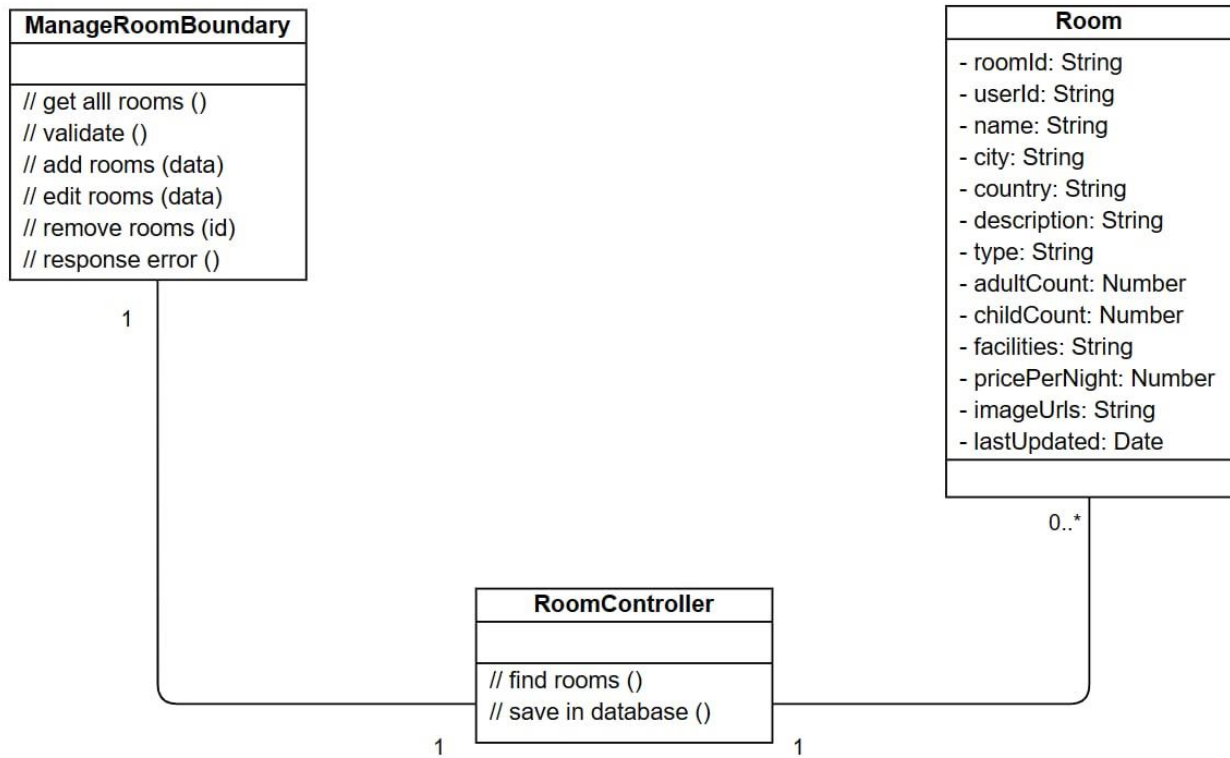
2.3.5 Book Room



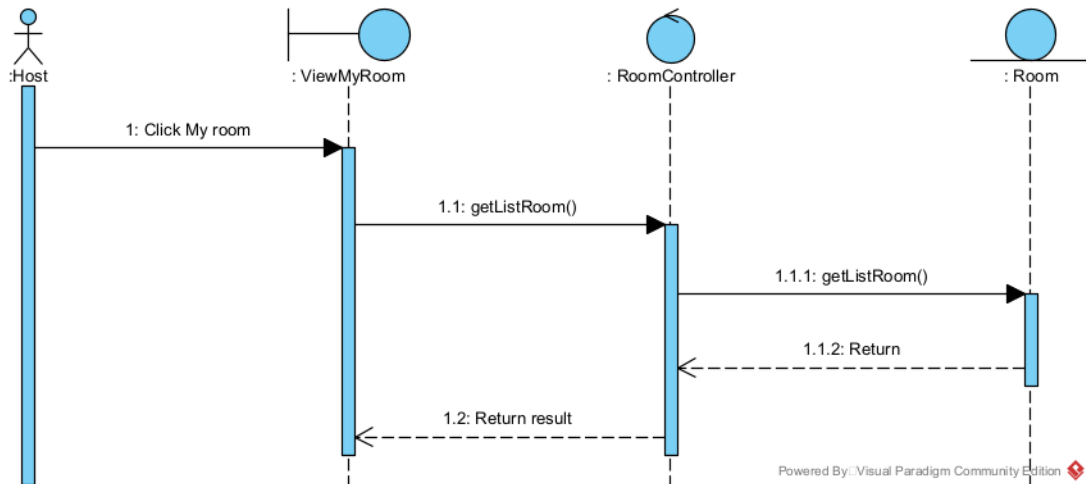
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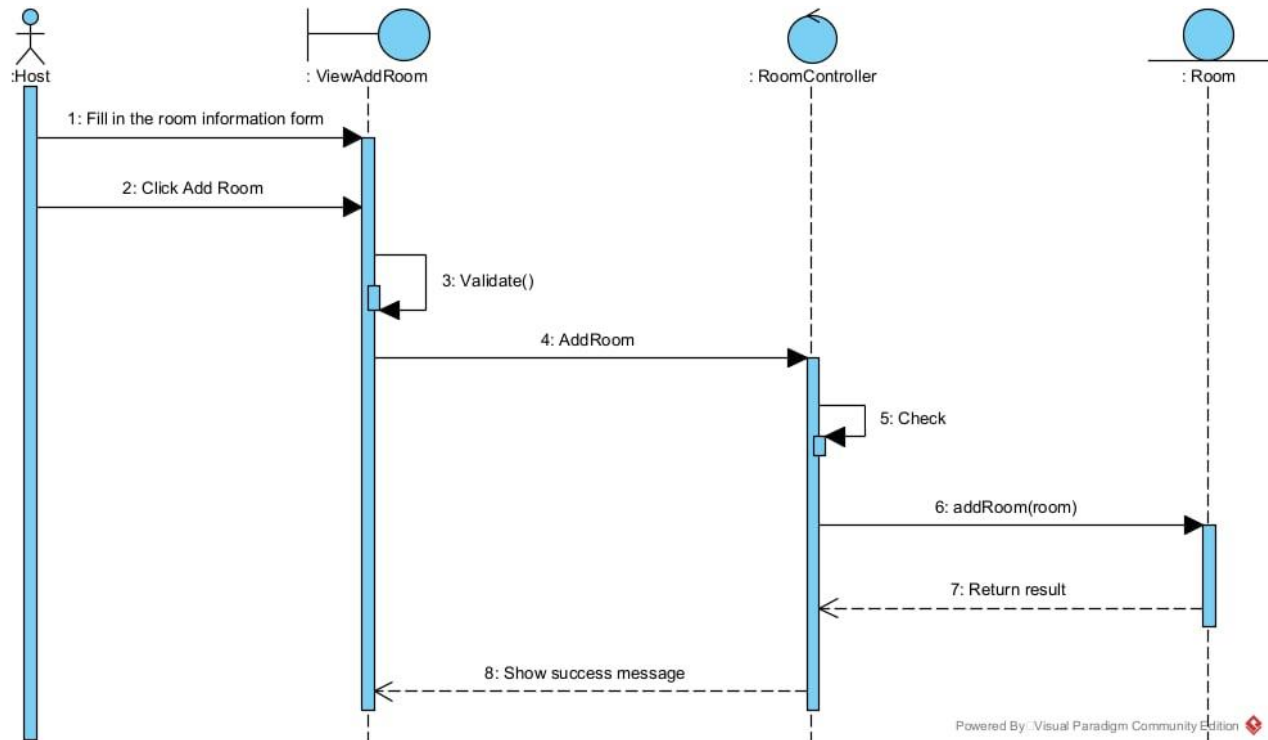


2.3.6 Manage Room

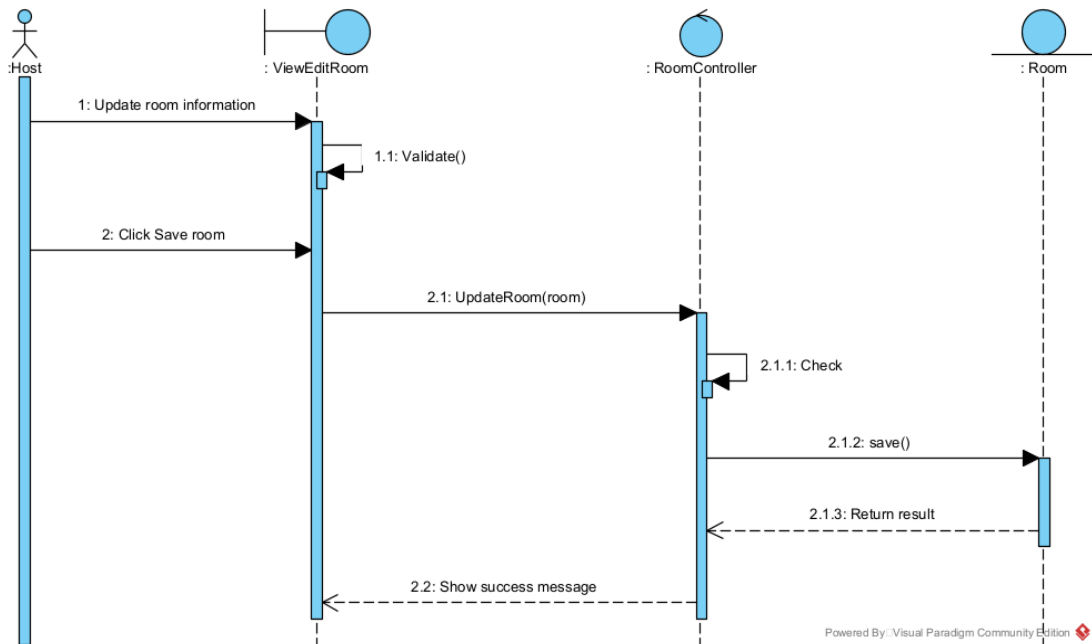


2.3.6.1 View my room

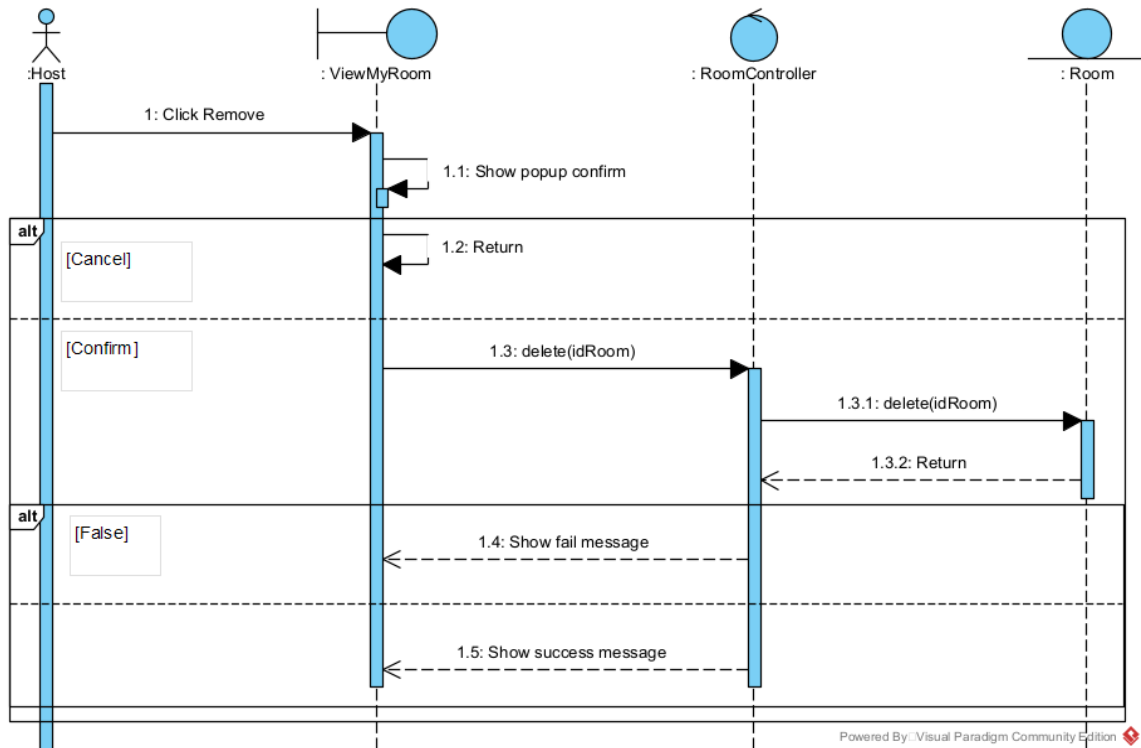




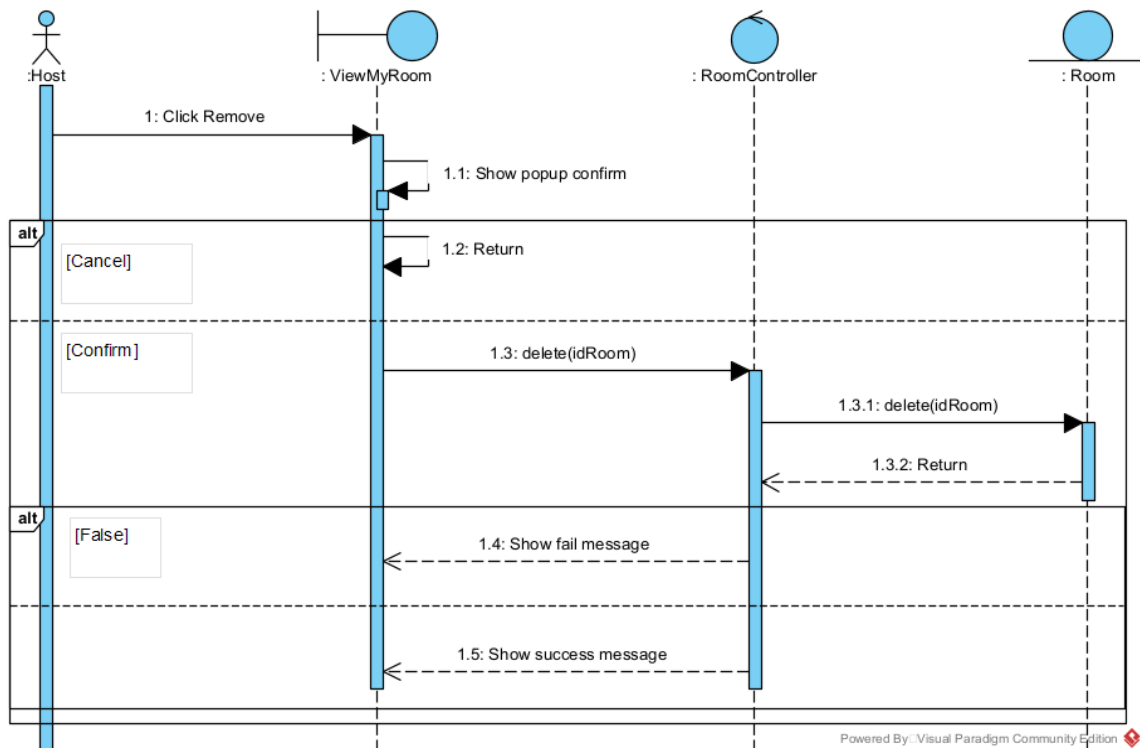
2.3.6.2 Add room



2.3.6.3 Edit room

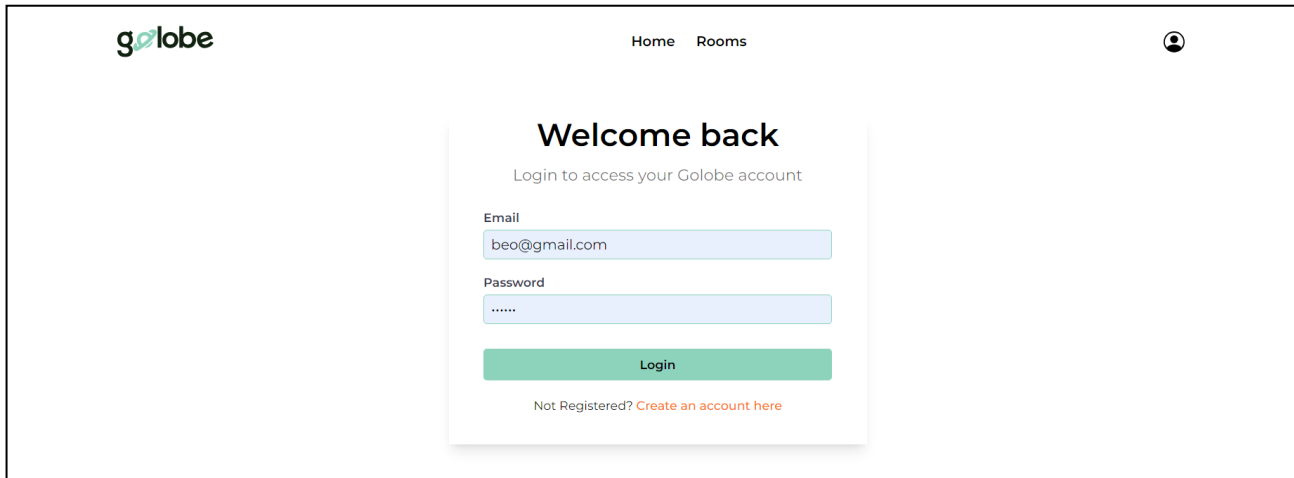


2.3.6.4 Delete room



3. User Interface Design

3.1 Login



The login form is centered on a white background. At the top left is the 'golobe' logo. At the top center are the links 'Home' and 'Rooms'. At the top right is a user profile icon. The form itself has a title 'Welcome back' and a subtitle 'Login to access your Golobe account'. It contains two input fields: 'Email' with the value 'beo@gmail.com' and 'Password' with masked characters '.....'. Below these is a green 'Login' button. At the bottom, there is a link 'Not Registered? Create an account here'.

golobe

Home Rooms

Welcome back

Login to access your Golobe account

Email

beo@gmail.com

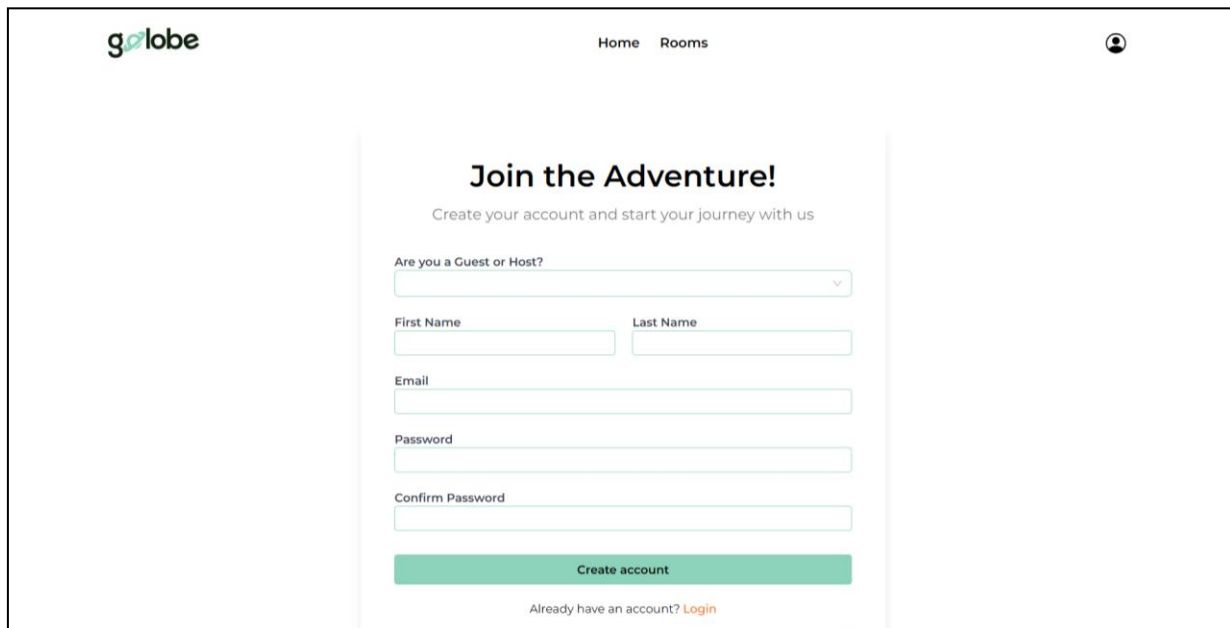
Password

.....

Login

Not Registered? [Create an account here](#)

3.2 Register



The register form is centered on a white background. At the top left is the 'golobe' logo. At the top center are the links 'Home' and 'Rooms'. At the top right is a user profile icon. The form has a title 'Join the Adventure!' and a subtitle 'Create your account and start your journey with us'. It starts with a dropdown menu 'Are you a Guest or Host?'. Below this are two input fields for 'First Name' and 'Last Name'. Then there are three more input fields for 'Email', 'Password', and 'Confirm Password'. A green 'Create account' button is at the bottom. At the very bottom, there is a link 'Already have an account? Login'.

golobe

Home Rooms

Join the Adventure!

Create your account and start your journey with us

Are you a Guest or Host?

First Name

Last Name

Email

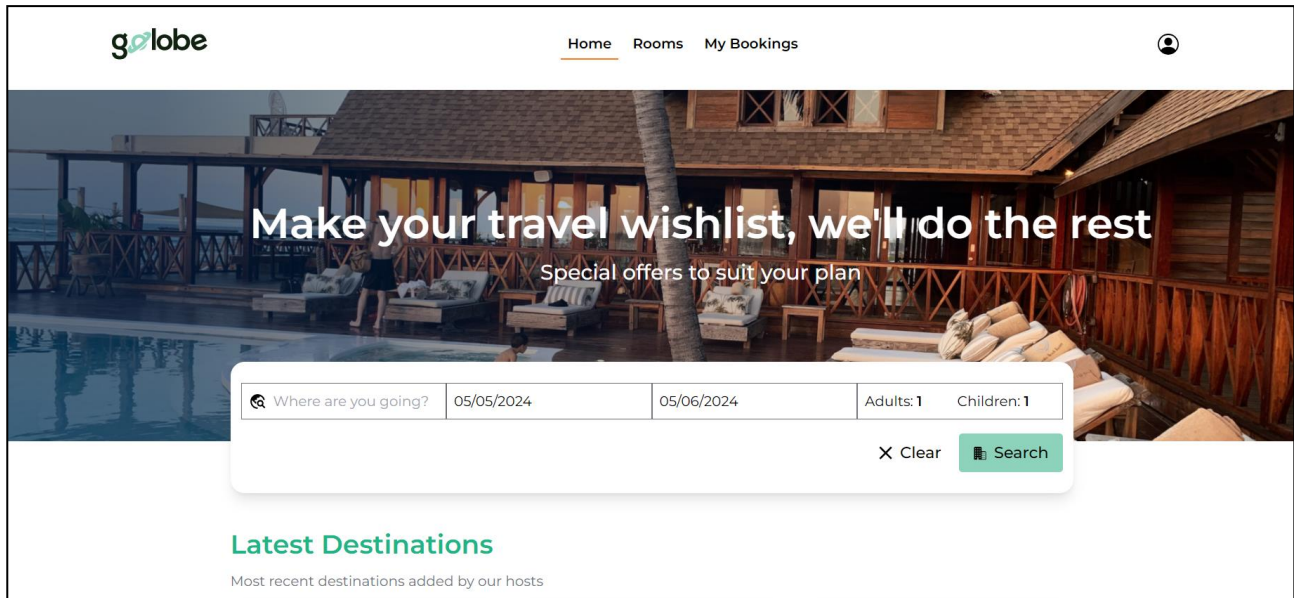
Password

Confirm Password

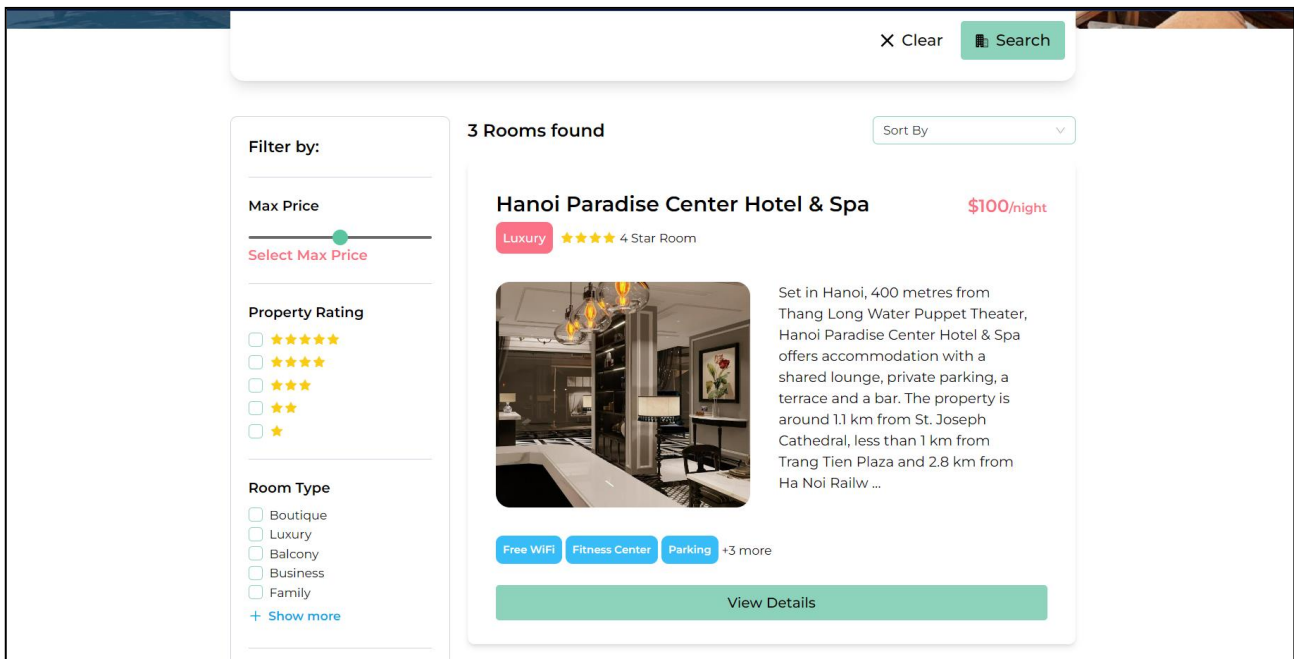
Create account

Already have an account? [Login](#)

3.3 Landing Page



3.4 Search Page



3.5 View Bookings

golobe

HomeRoomsMy Bookings

Make your travel wishlist, we'll do the rest

Special offers to suit your plan

Where are you going?

05/05/2024

05/06/2024


Adults: 2

Children: 1

X Clear

Search

My Bookings



Scent Premium Hotel

Hanoi, Vietnam

Dates: Mon May 06 2024 -Tue May 07 2024

Guests: 2 adults, 1 children

3.6 Booking Confirmation

Special offers to suit your plan

Where are you going?

05/05/2024

05/06/2024

Adults: 2

Children: 1

X Clear

Search

Your Booking Details

Location:

Scent Premium Hotel , Hanoi, Vietnam

Check-in

Mon May 06 2024

Check-out

Tue May 07 2024

Total length of stay:

1 nights

Guests

2 adults & 1 children

Confirm Your Details

First Name

Son

Last Name

Nguyen

Email

1234567@gmail.com

Your Price Summary

Total Cost: £100.00

Includes taxes and charges

Payment Details

Card number

MM / YY CVC

Confirm Booking

3.7 Hotel Detail Page

Book Now

3.8 User Profile

The screenshot shows the 'golobe' application interface. The top navigation bar includes the logo, 'Home', 'Rooms', 'My Bookings', and a user profile icon. The main banner features a resort pool scene with the text 'Make your travel wishlist, we'll do the rest' and 'Special offers to suit your plan'. On the left, a sidebar contains 'Personal Details' (selected) and 'Change Password'. The 'Personal details' form includes fields for 'First Name' (Son), 'Last Name' (Nguyen), and 'Email' (1234567@gmail.com), with an 'Edit' button at the bottom.

golobe Home Rooms My Bookings

Make your travel wishlist, we'll do the rest
Special offers to suit your plan

Personal Details
Change Password

Personal details
Keep your details current to ensure seamless communication and services

First Name Son
Last Name Nguyen
Email 1234567@gmail.com
Edit

3.9 Change Password

This screenshot displays the 'Change Password' page. The layout is consistent with the previous one, but the sidebar now highlights 'Change Password'. The main form area is titled 'Change Password' with the instruction 'Keep your password secure and up to date'. It contains three input fields: 'Current Password', 'New Password', and 'Confirm Password', followed by a 'Save' button.

golobe Home Rooms My Bookings

Make your travel wishlist, we'll do the rest
Special offers to suit your plan

Personal Details
Change Password

Change Password
Keep your password secure and up to date

Current Password
New Password
Confirm Password
Save

3.10 View Host's Rooms

My Rooms




Add Room

You're owning 2 rooms

Hanoi Paradise Center Hotel & Spa ★★★★★ 4 Star Rating

\$100/night

Hanoi, Vietnam

Description

Set in Hanoi, 400 metres from Thang Long Water Puppet Theater, Hanoi Paradise Center Hotel & Spa offers accommodation with a shared lounge, private parking, a terrace and a bar. The property is around 1.1 km from St. Joseph Cathedral, less than 1 km from Trang Tien Plaza and 2.8 km from Ha Noi Railway station. The accommodation features a 24-hour front desk, airport transfers, room service and free WiFi.

Luxury

5 adults, 5 children

Remove

Edit Details

View Bookings

The Five Residences Hanoi ★★★★★ 5 Star Rating

\$200/night

3.11 View Guests' Bookings

Where are you going?

05/05/2024

05/06/2024

Adults: 2 Children: 1

X Clear

Search

Guest Bookings

Booked by: Son Dopin

Email: 123456@gmail.com

Dates: From Saturday, May 4, 2024 to Monday, May 6, 2024

Guests: 2 adults and 3 children

3.12 Add Room

Add Room

Name

City

Country

Select a city

Select a country

Description

Price Per Night

Star Rating

Select as Rating

Type

Boutique

Luxury

Balcony

Business

Family

Romantic

Breakfast

Cabin

Non-Smoking

Bath

Motel

All Inclusive

Pet Friendly

Self Catering

Facilities

☐ Free WiFi

☐ Parking

☐ Airport Shuttle

☐ Outdoor Pool

☐ Spa

☐ Fitness Center

Guests

Adults

Children

Images

Choose Files

No file chosen

Save

4. Data Structures and Algorithms

There are some notable data structures and algorithms used in the project:

- Bcrypt hashing function: a cryptographic algorithm that hashes passwords in a way that is secure against brute-force attacks.
- sessionStorage: a web storage API that's used to store data on the client side for the duration of the session. In this project, sessionStorage is used to persist the state of destination, checkIn, checkOut variables across page reloads.

5. External Interfaces

a) GeoDB Cities API:

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- **Description:** The GeoDB Cities API provides a comprehensive database of cities worldwide. It allows us to retrieve city-related data based on user input, such as city name or geographical coordinates.
- **Functionality:** The API supports various endpoints for querying cities by name, country code, or location. It returns detailed information about cities, including their name, country, population, coordinates, and more.
- **Usage in the system:** When a user inputs a location, we'll send a request to the GeoDB Cities API to fetch relevant city data. This data will then be used to populate the UI with available location options.

b) REST Countries API:

- **Description:** The REST Countries API provides information about countries worldwide. It offers data such as country name, capital, population, languages, currencies, and more.
- **Functionality:** This API allows us to retrieve country-related data based on the city selected by the user. We'll use it to obtain additional information about the country corresponding to the chosen city.
- **Usage in the system:** After the user selects a city, we'll send a request to the REST Countries API to obtain data about the corresponding country. This data can then be displayed alongside the selected city information in the UI, providing users with additional context.