
Design Document

for

Homestay Booking Website Project

Version 1.0

Prepared by

Group 6

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REVISIONS

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#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).

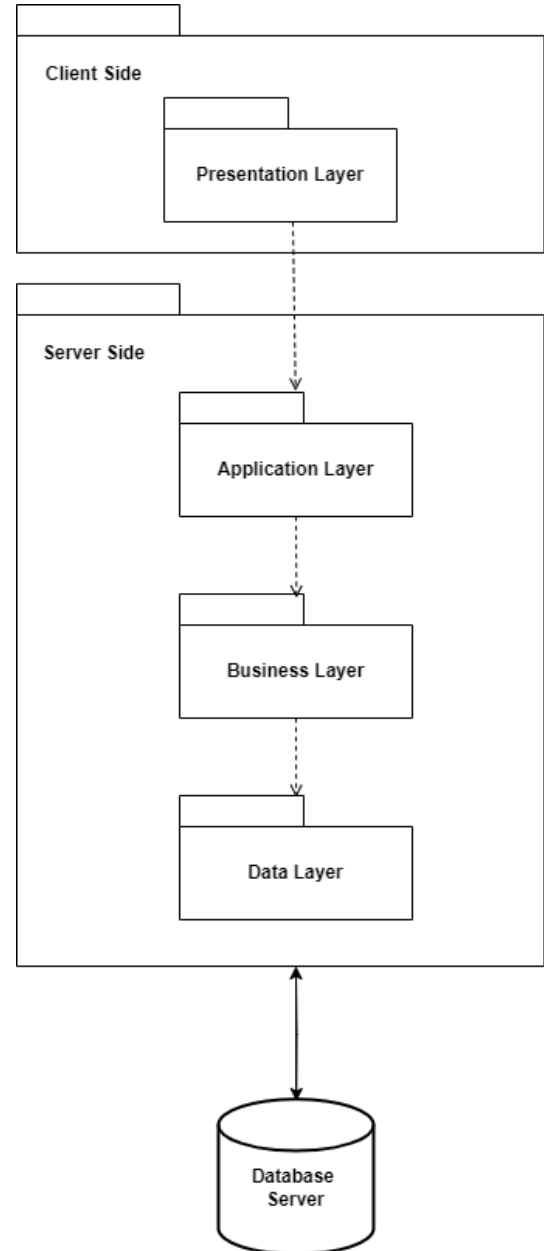


Figure 1. Architecture overview

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.

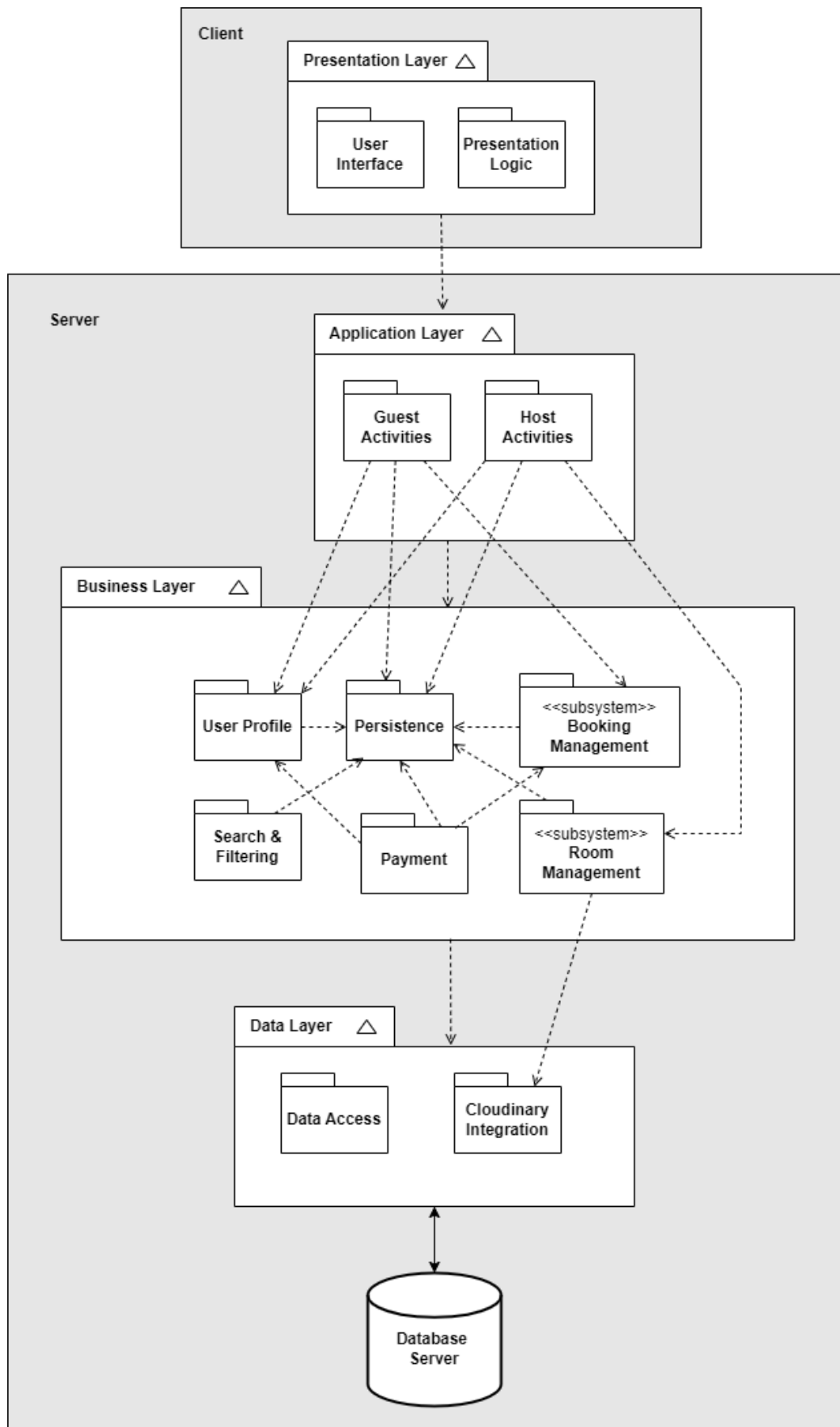


Figure 2. Architectural model

- **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.

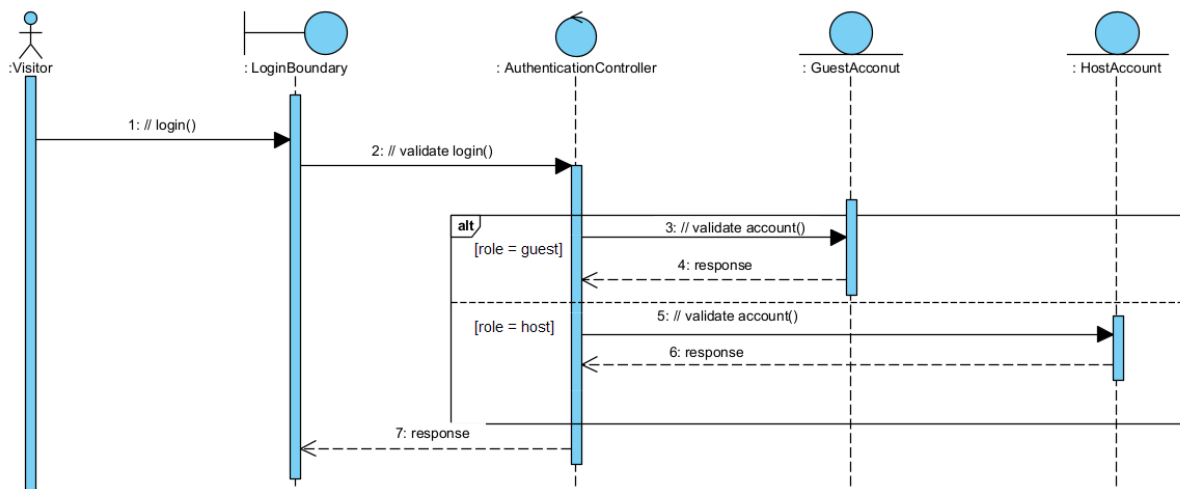
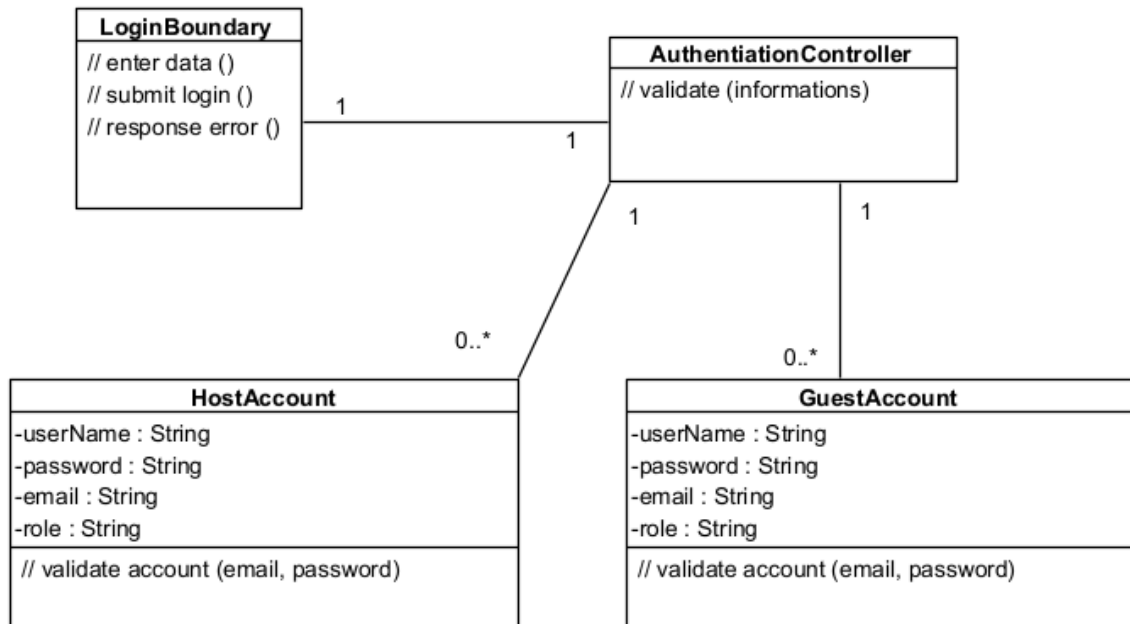
2.2.4 Data Layer Components

- 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.

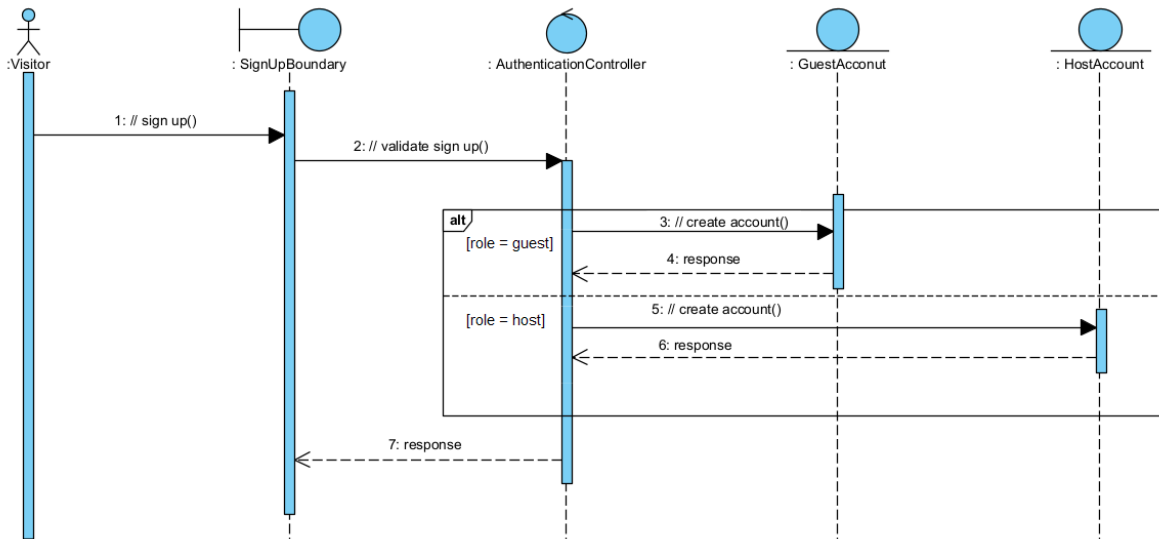
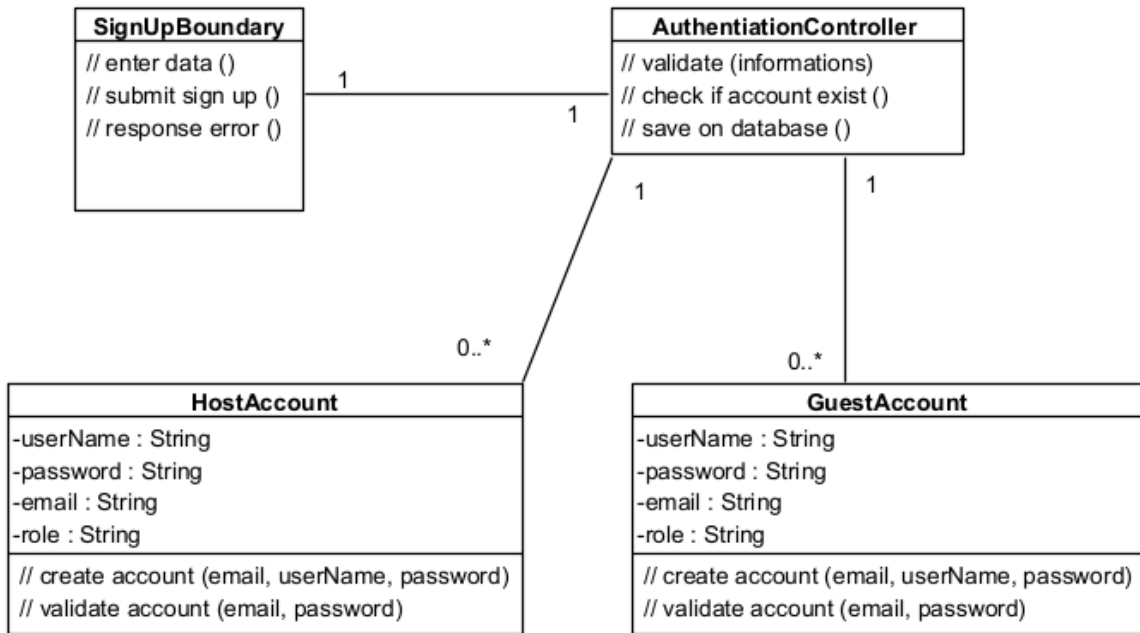
Figure 2 illustrates components of each layer and the dependencies between them.

2.3 Use Case Diagrams

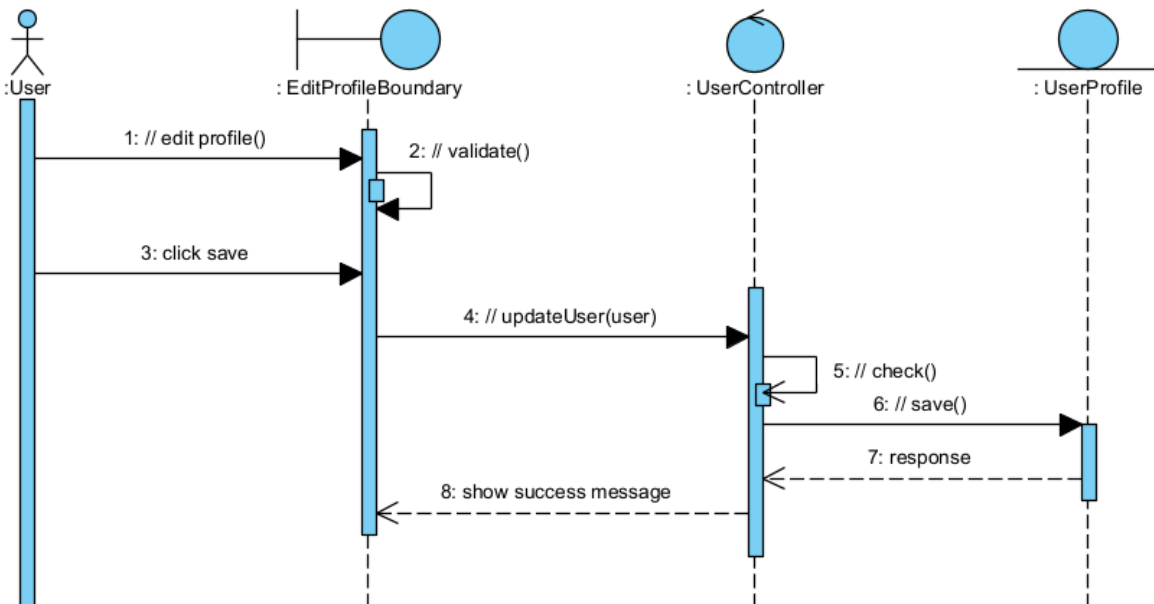
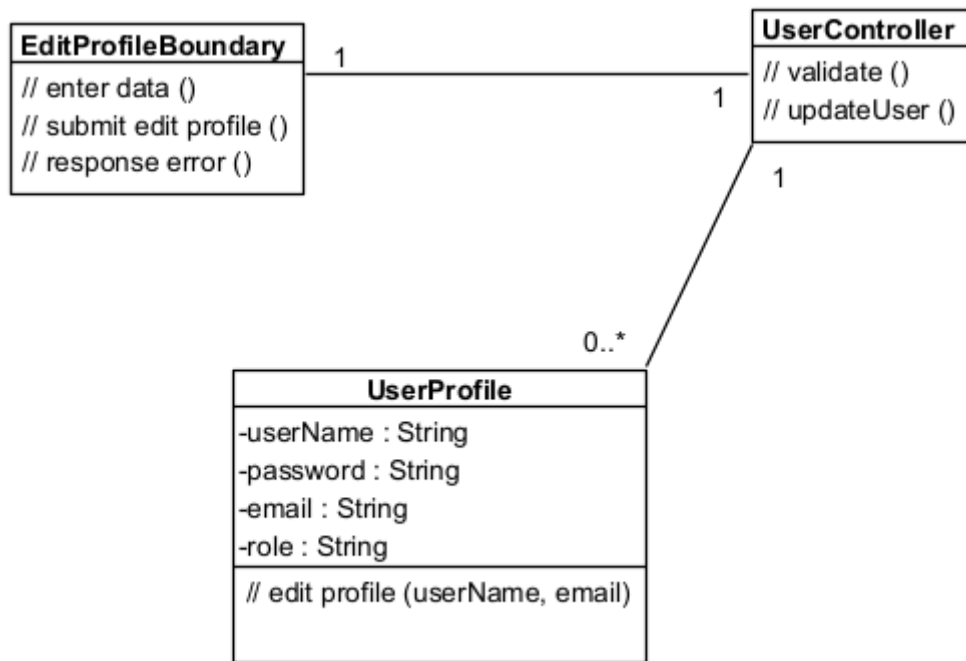
2.3.1 Login



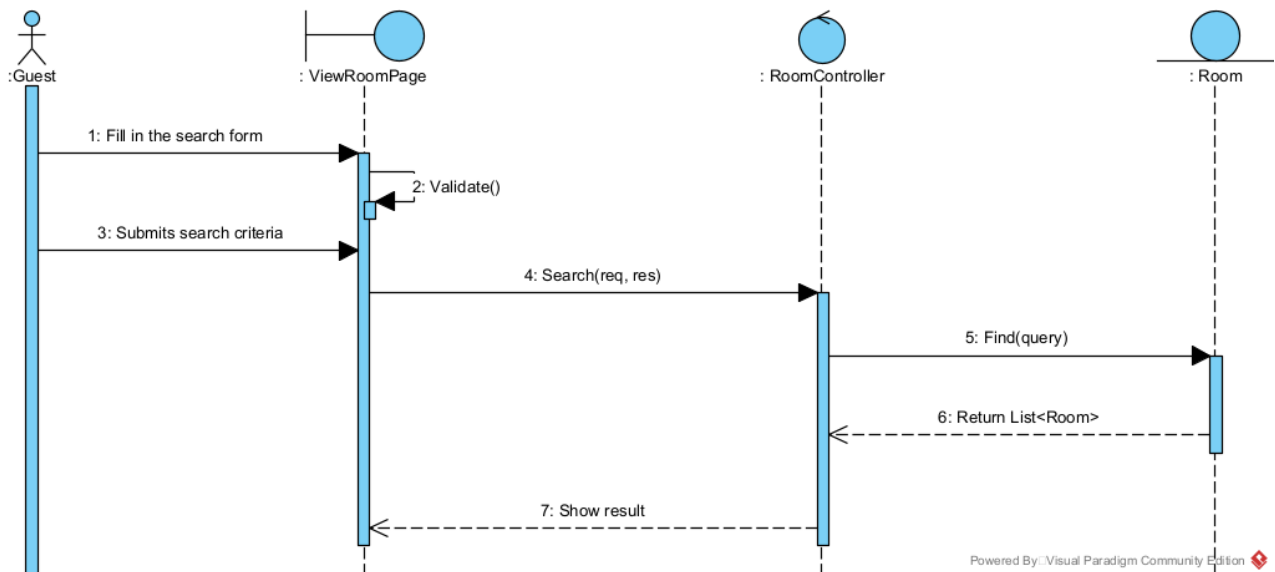
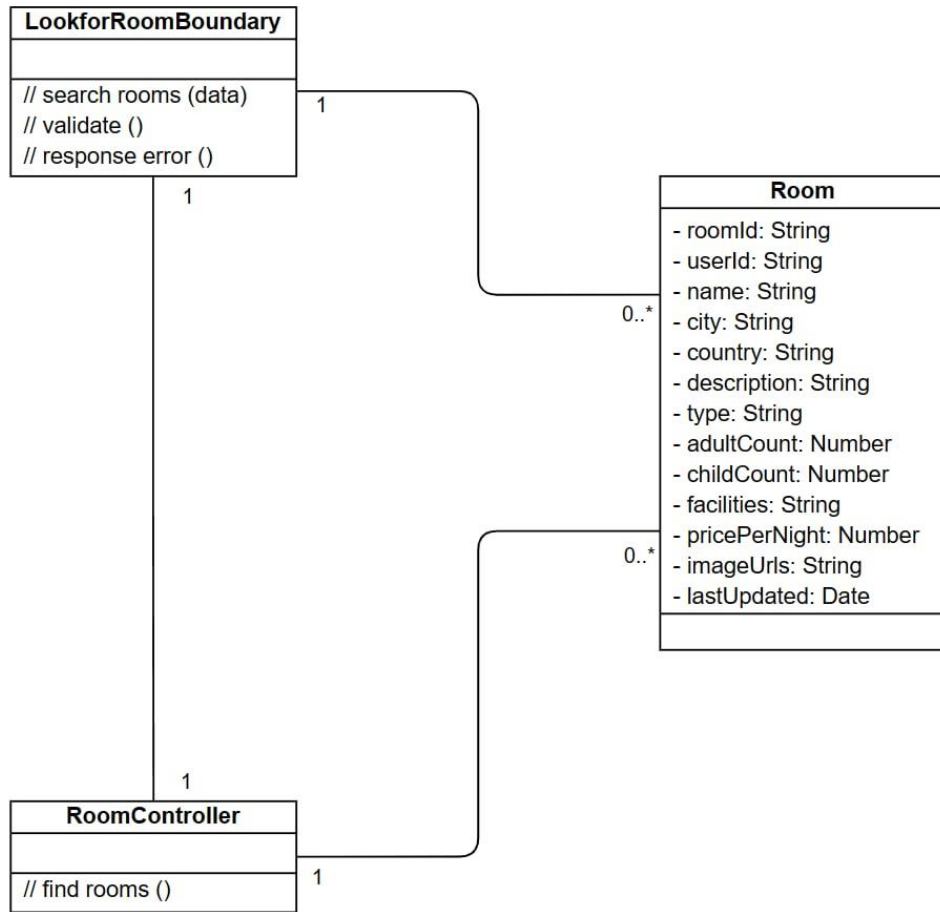
2.3.2 Register



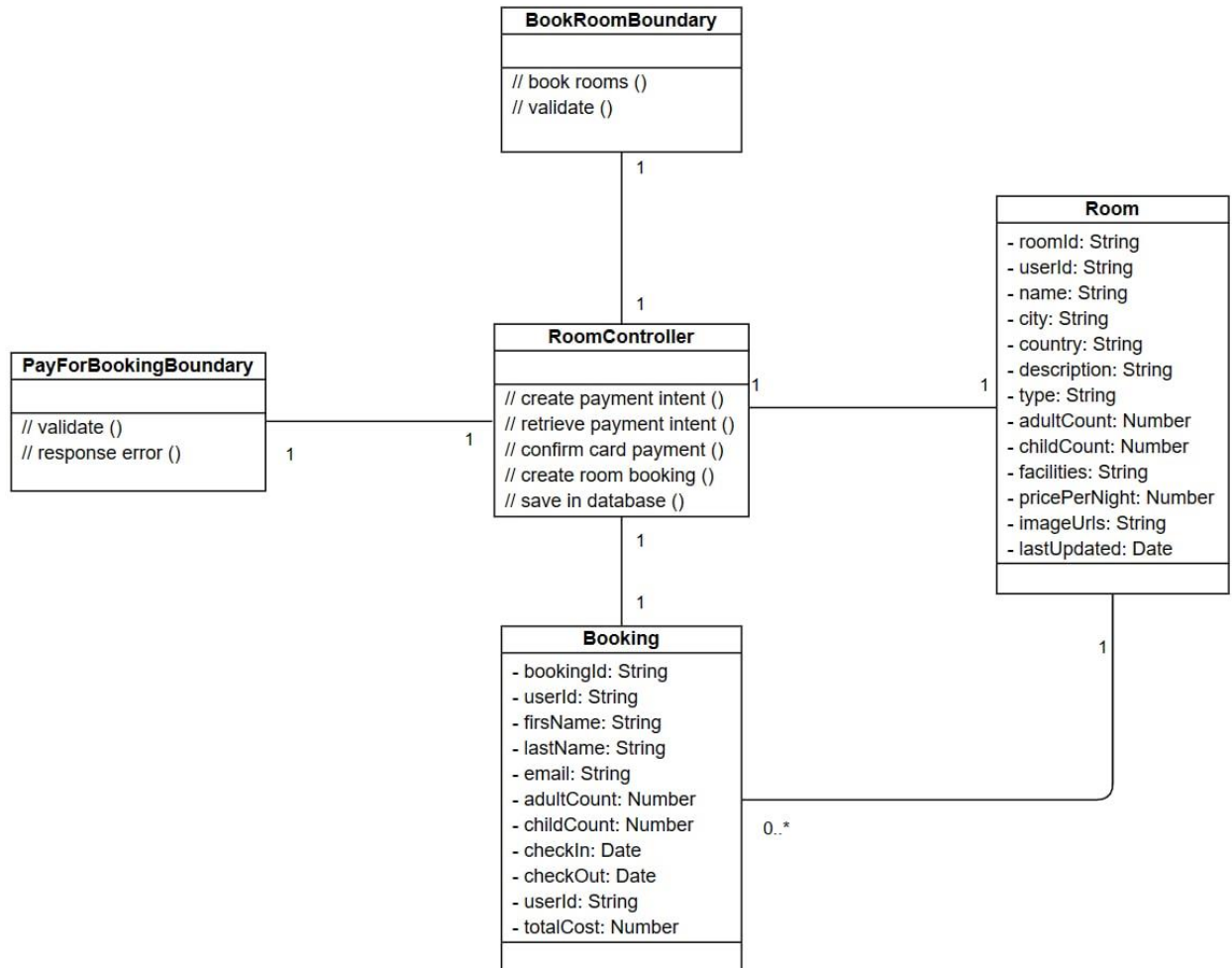
2.3.3 Edit Profile



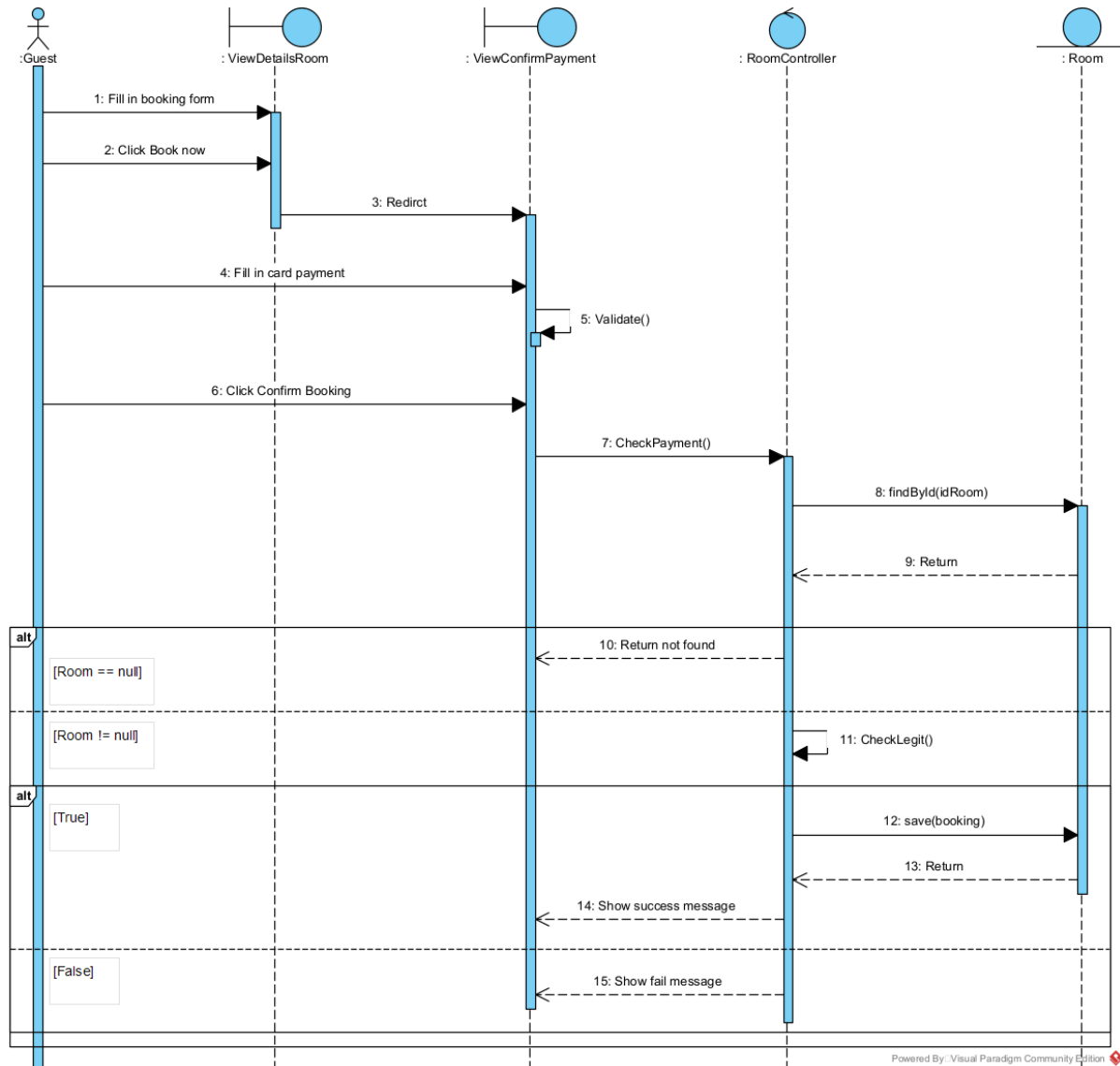
2.3.4 Search Room



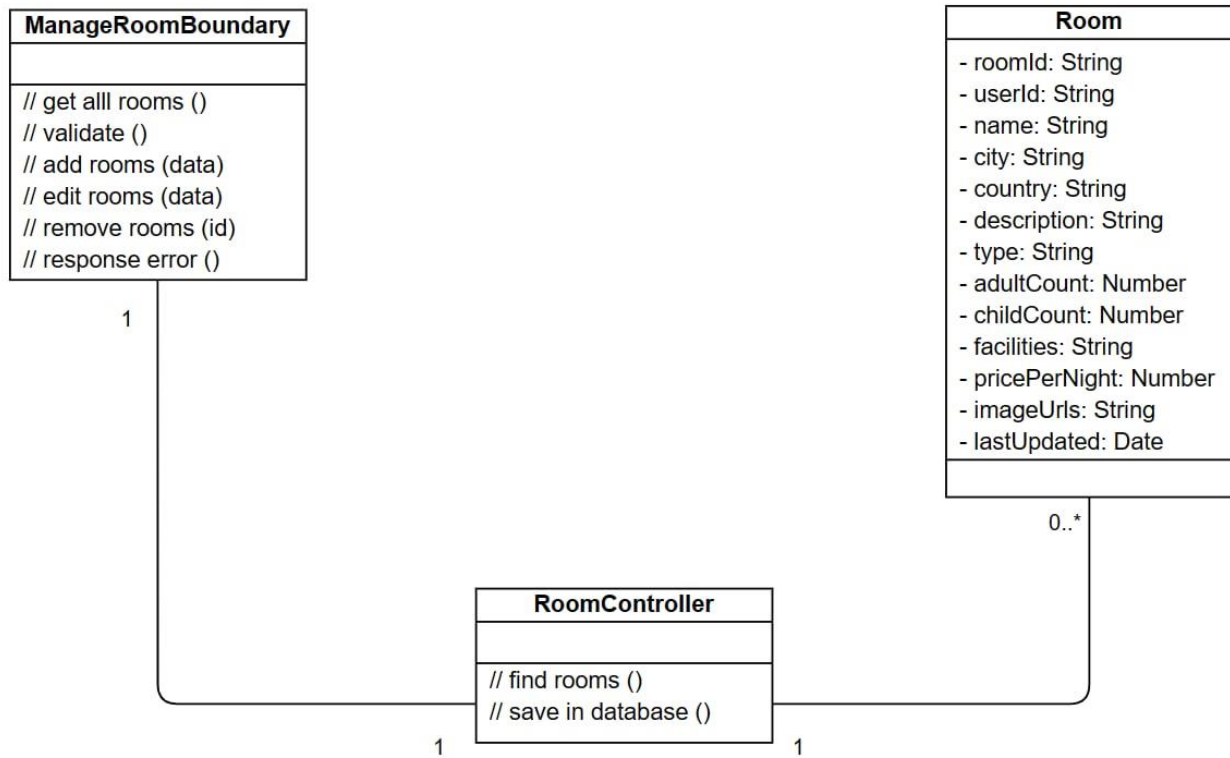
2.3.5 Book Room



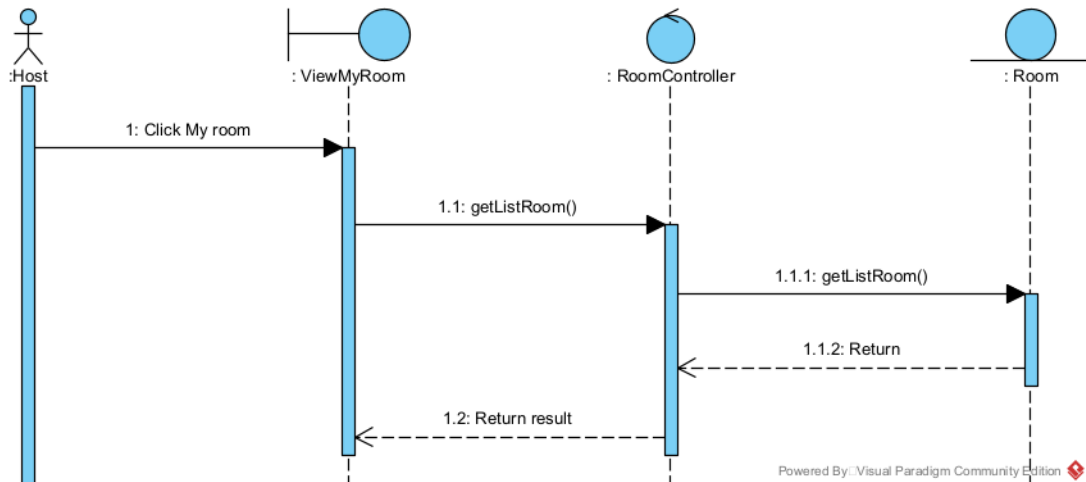
HOMESTAY BOOKING WEBSITE PROJECT

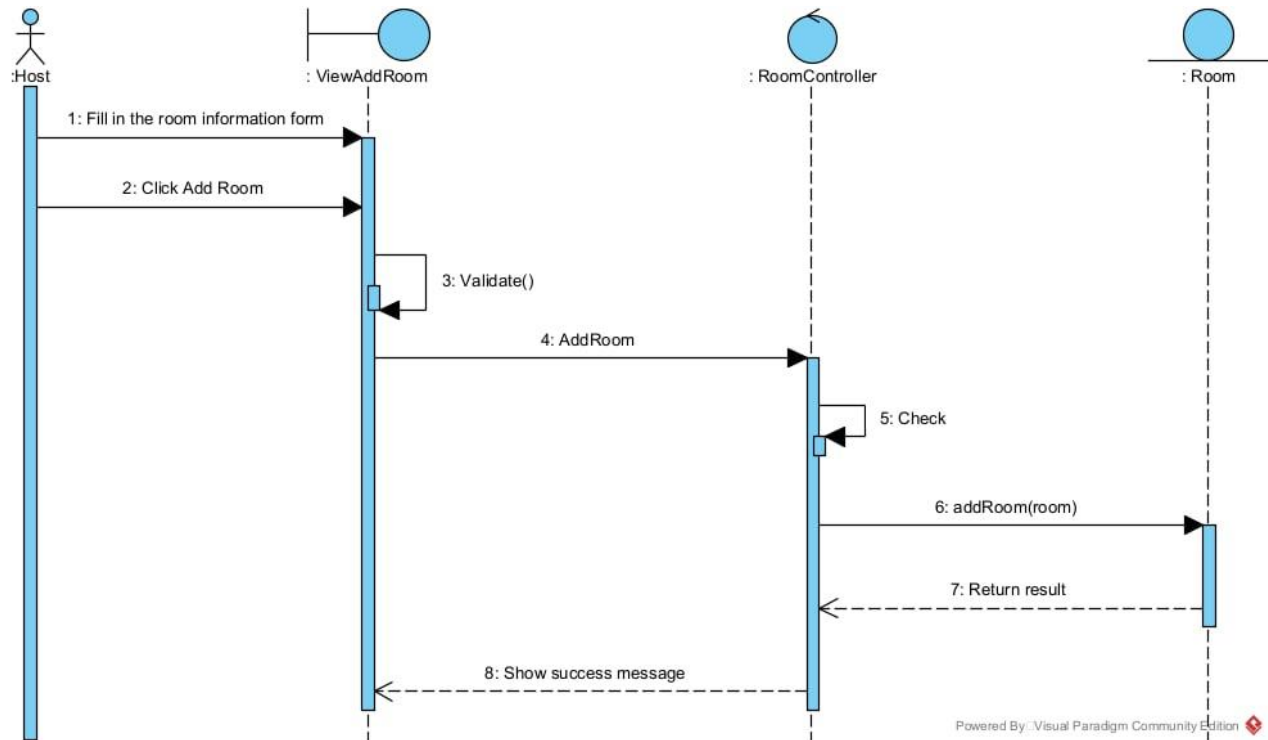


2.3.6 Manage Room

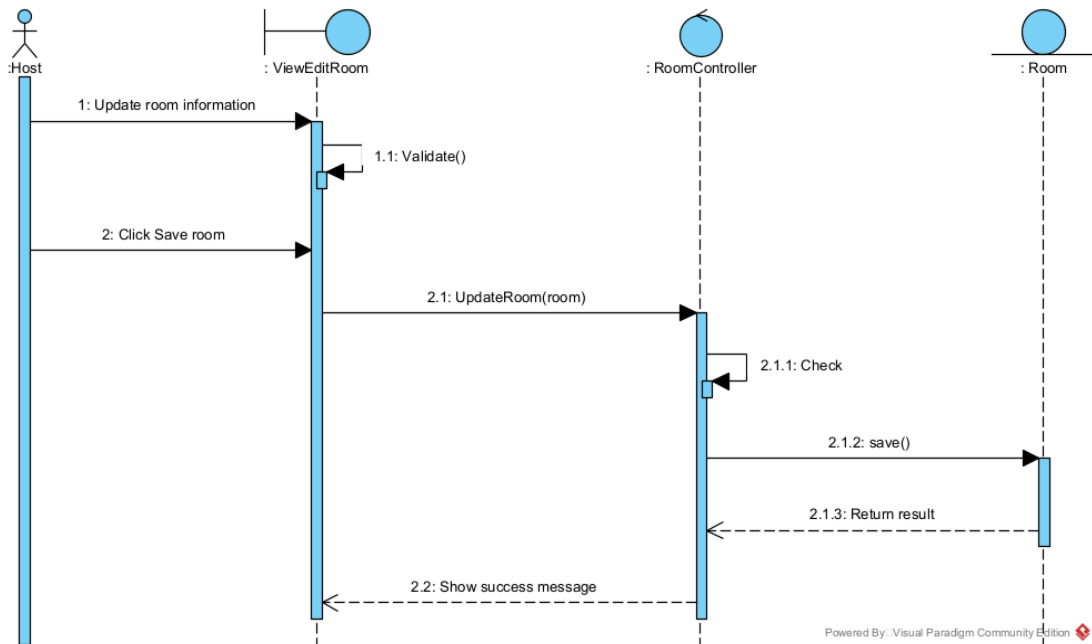


2.3.6.1 View my room

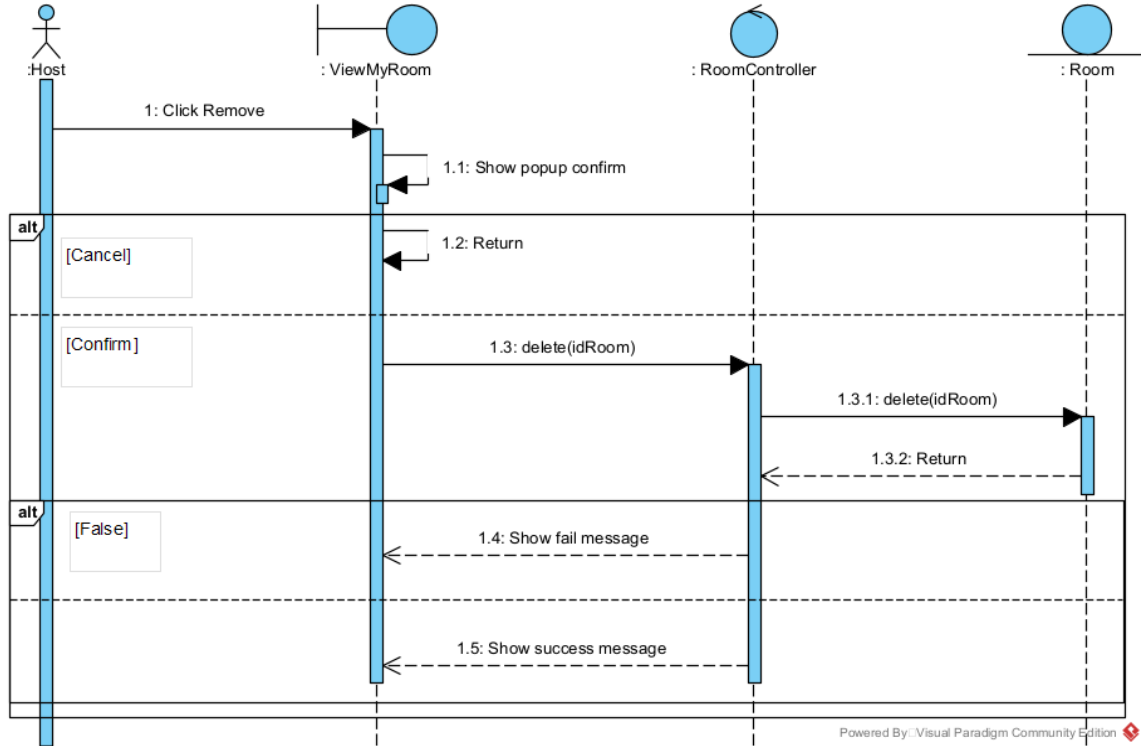




2.3.6.2 Add room



2.3.6.3 Edit room



2.3.6.4 Delete room

3. User Interface Design

3.1 Login

[Home](#)
[Rooms](#)

Welcome back

Login to access your Golobe account

Email

Password

Login

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

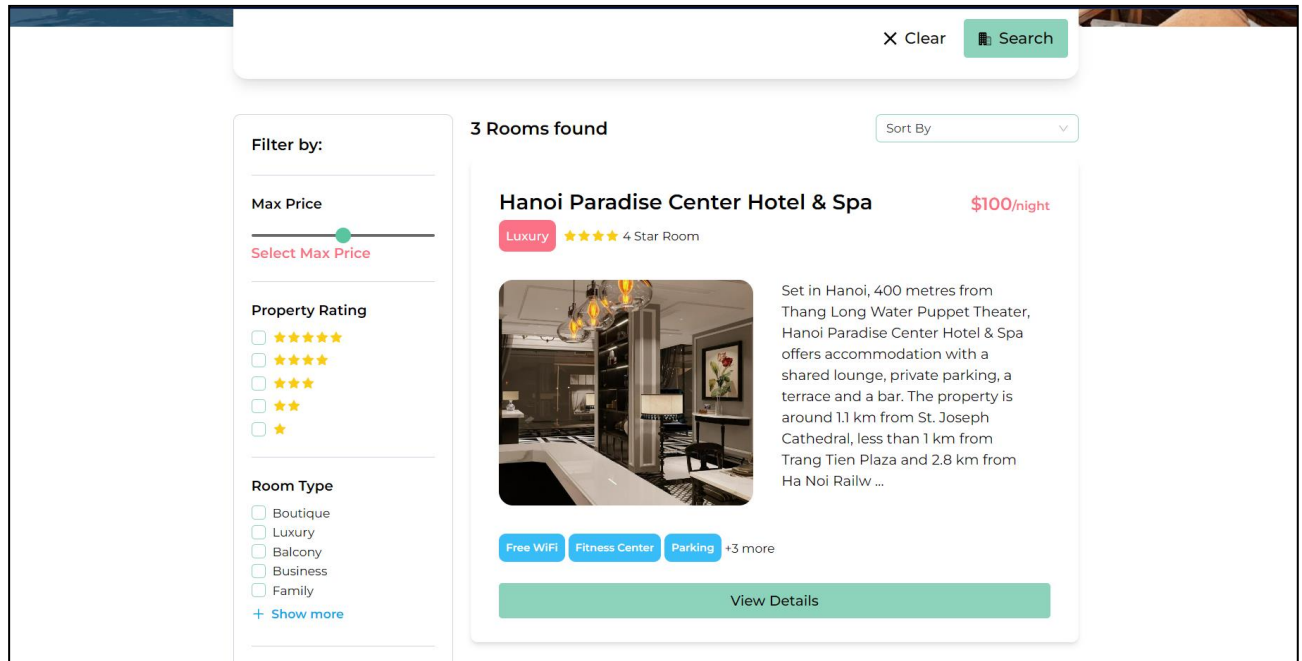
3.2 Register

The screenshot shows the registration page of the goLobe website. The header includes the goLobe logo, navigation links for 'Home' and 'Rooms', and a user profile icon. The main heading is 'Join the Adventure!' with the subtext 'Create your account and start your journey with us'. Below this is a registration form with the following fields: a dropdown menu for 'Are you a Guest or Host?', input fields for 'First Name' and 'Last Name', an 'Email' field, a 'Password' field, and a 'Confirm Password' field. A green 'Create account' button is at the bottom of the form. Below the button, there is a link that says 'Already have an account? Login'.

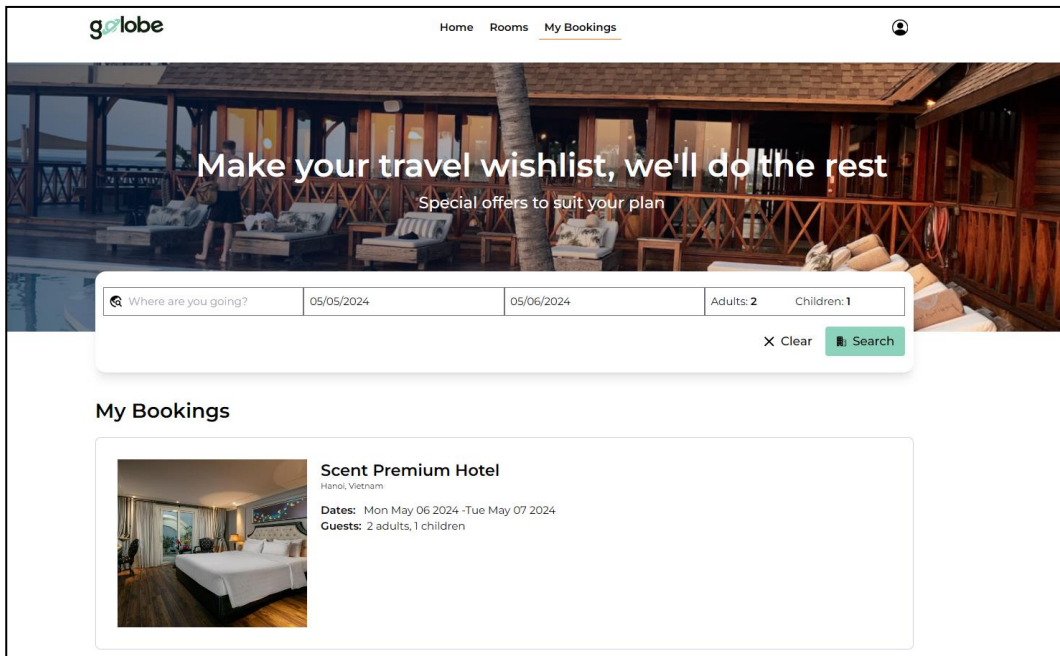
3.3 Landing Page

The screenshot shows the landing page of the goLobe website. The header includes the goLobe logo, navigation links for 'Home', 'Rooms', and 'My Bookings', and a user profile icon. The main visual is a large banner image of a tropical resort with a pool and lounge area. Overlaid on the banner is the text 'Make your travel wishlist, we'll do the rest' and 'Special offers to suit your plan'. Below the banner is a search bar with the following fields: 'Where are you going?', '05/05/2024', '05/06/2024', 'Adults: 1', and 'Children: 1'. There are 'Clear' and 'Search' buttons. Below the search bar is a section titled 'Latest Destinations' with the subtext 'Most recent destinations added by our hosts'.

3.4 Search Page



3.5 View Bookings



3.6 Room Detail Page


Vietnam > Hanoi > Hanoi Paradise Center Hotel & Spa

Luxury

★★★★★ 4 Star Room

\$100/night

Hanoi, Vietnam



Overview

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.

Facilities

- Free WiFi
- Fitness Center
- Parking
- Airport Shuttle
- Outdoor Pool
- Spa

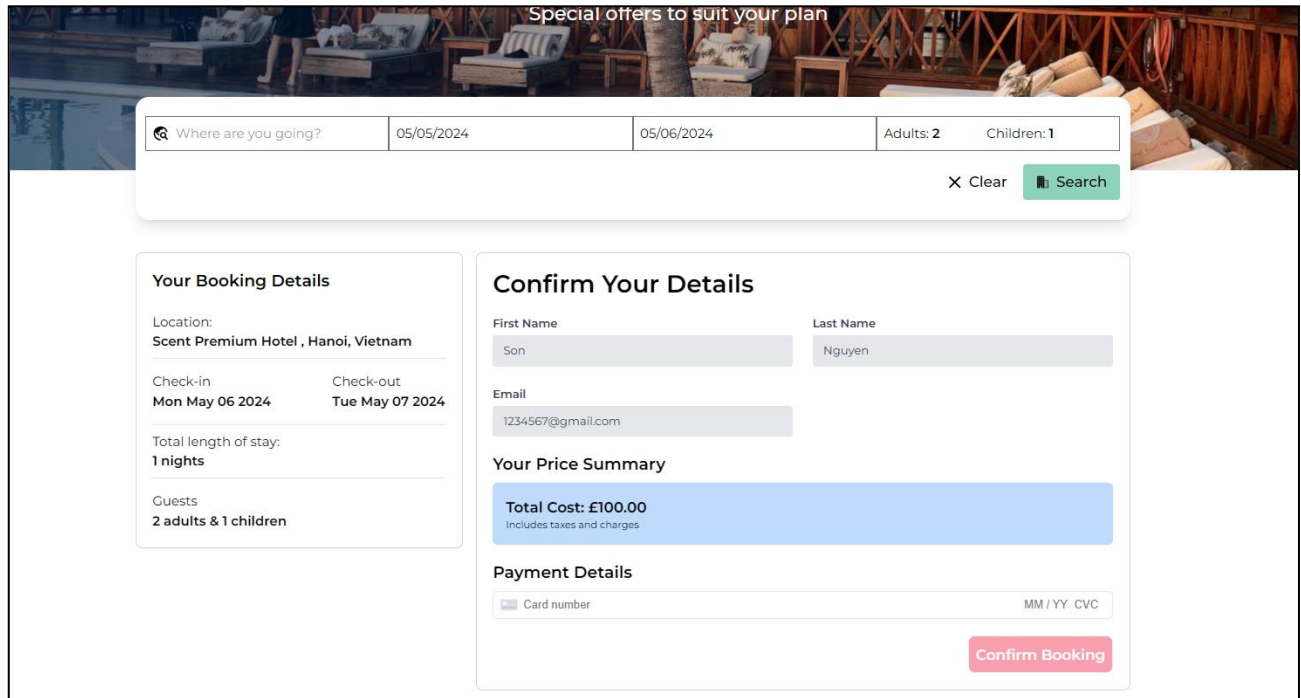
05/05/2024

05/05/2024

Adults: 1 Children: 1

Book Now

3.7 Booking Confirmation



The booking confirmation form is displayed on a background image of a hotel pool area. At the top, a banner reads "Special offers to suit your plan". Below this is a search bar with the text "Where are you going?". To the right of the search bar are two date fields: "05/05/2024" and "05/06/2024". Further right are two fields for "Adults: 2" and "Children: 1". To the right of these fields are two buttons: "X Clear" and "Search".

The form is divided into two main sections: "Your Booking Details" and "Confirm Your Details".

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

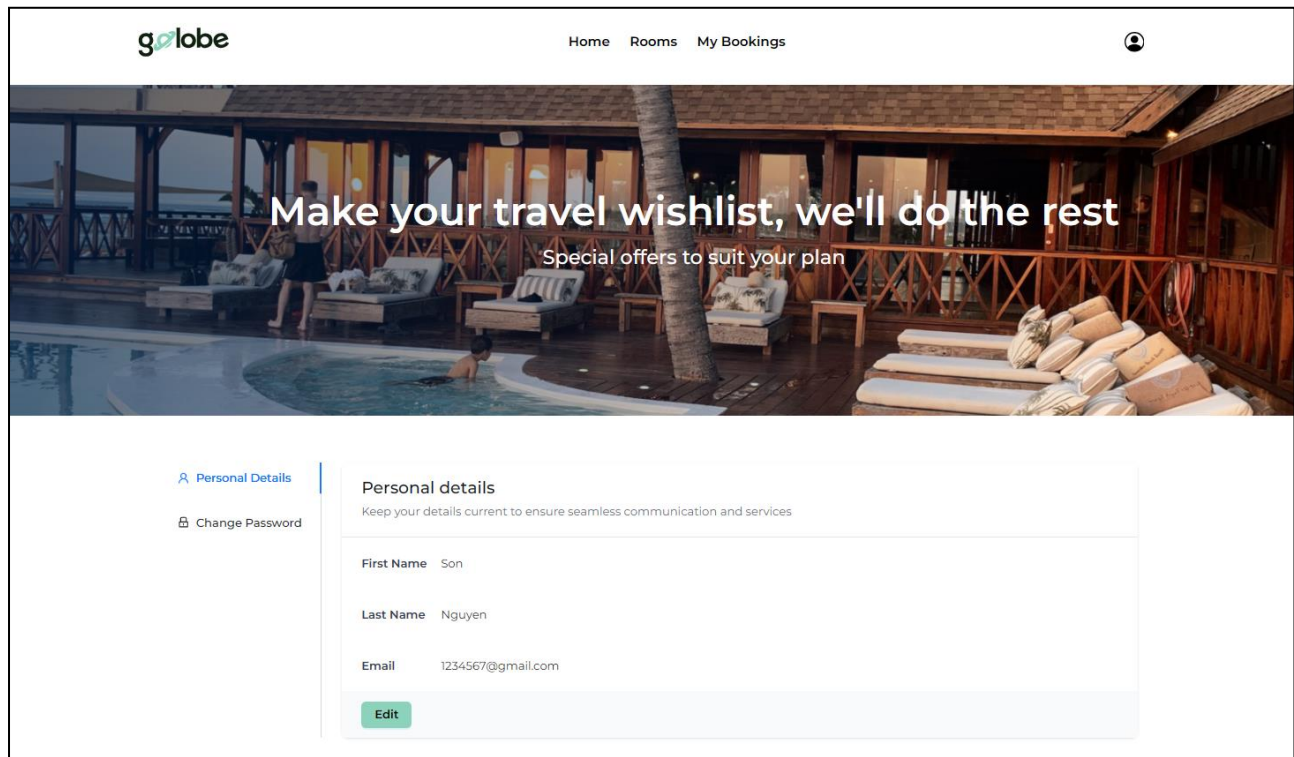
Payment Details

Card number

MM / YY CVC

Confirm Booking

3.8 User Profile



The user profile form is displayed on a background image of a hotel pool area. At the top, the "golobe" logo is on the left, and "Home Rooms My Bookings" is on the right. A user icon is on the far right. Below the header is a banner with the text "Make your travel wishlist, we'll do the rest" and "Special offers to suit your plan".

The form is divided into two main sections: "Personal Details" and "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

globe

HomeRoomsMy 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

18

3.11 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

3.12 View Guests' Bookings

Where are you going?

05/05/2024

05/06/2024

Adults: 2

Children: 1

✕ 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

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:

- 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.