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(قسم الطالبات)

**CS 431: Mobile Computing and Applications Development**

**Project Report**

# Hotel Reservation System

**By**

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**Section: C9A**

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# ABSTRACT

The project is an android application to help people booking their favorite hotels after they sign in. The booking can be done either by choosing the hotel from the list or by searching. The payment is also done inside the application. This project has been through four main software development phases which are: system analysis, system design, system implementation, and system testing.

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# 1. Introduction

## 1.1 Introduction

According to 'Travelport' 58% of people prefer to use mobile apps to search and book for travel and hotels. One of the main reasons for mobile booking apps is that you can complete the booking process without any human interaction, all you need is a mobile app and an internet connection.

Nazeel is a hotel reservation application that aims to deliver easy to use, fast booking experience. This report discusses the analysis and design process of the system.

## 1.2 Project Objectives

The following list shows the main objectives of the project:

- To develop a mobile application that allows the user to search for a hotel room and book it or cancel a reservation online at any time.
- To design and implement a database to integrate with the application.
- To allow the users to get real-time information on room availability.
- To allow the hotel owner to get fast and easy retrieval of guest records

## 1.3 Benefits of the application

The proposed application can deliver many features to its users, the following list shows the main benefits the application aims to deliver:

- **Ease of use:** the application has an intuitive user interface that is straight forward.
- **Time saving:** the application makes searching for hotels in a specified date fast.
- **Booking a hotel online:** the application allows the users to complete the booking of the desired hotel room through the app, without the need for any human interaction.
- **Online payment:** the application offers different online payment methods to complete the booking.
- **Availability around the clock:** the application is always available and updates automatically from the database.

- **Easy access to clients:** the application provides hotel owners with access to more clients.

## 1.4 Project Scope

The project is helpful for anyone who wishes to book a resident stay in a trustful hotel without personally going to the hotel. Hotels can be from many locations and countries.

## 1.5 Project Timeline

Figure 1 shows our plan to achieve the project objectives in approximately 6 weeks.

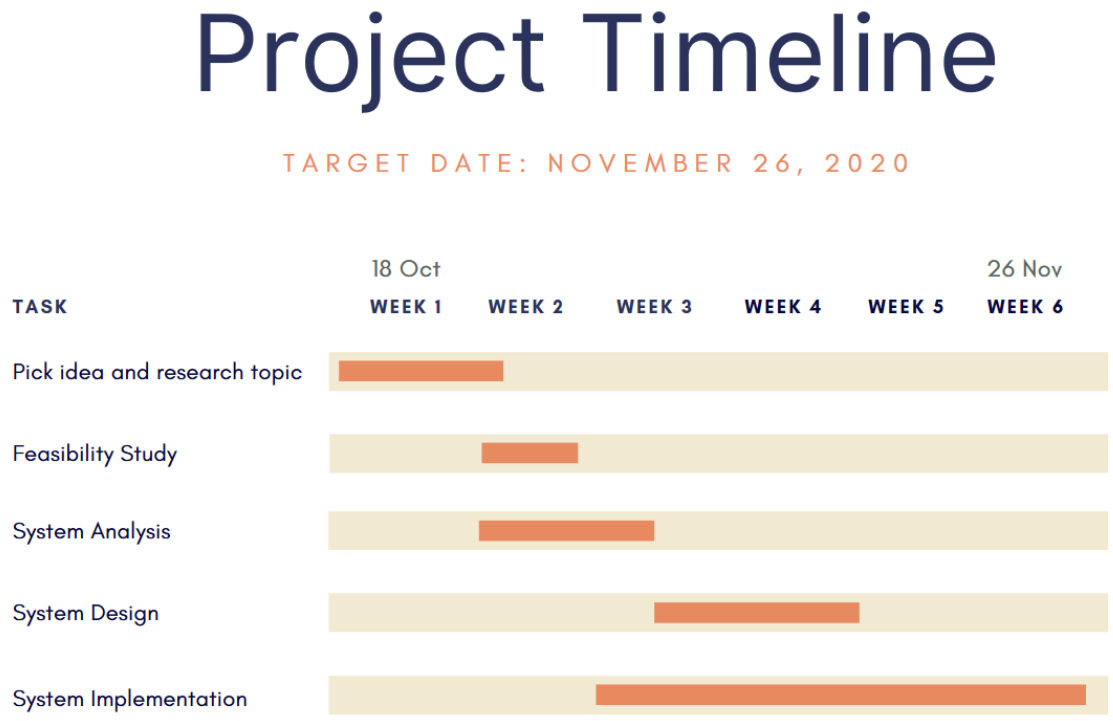



**Figure 1** Project Gantt Chart

## 1.6 Team Organization

Figure 2 shows how we divided the tasks among the team to achieve our objectives before the deadline.

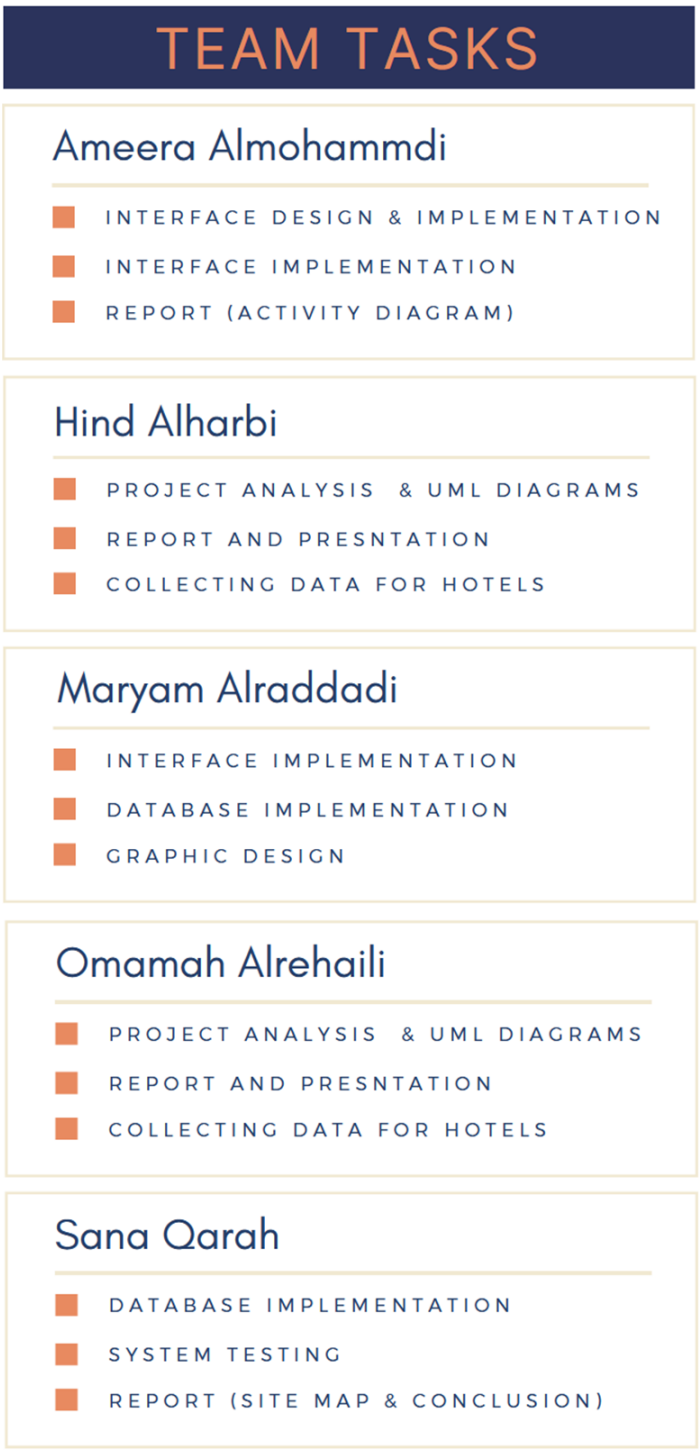



**Figure 2** Team tasks

# 2. System Analysis

This section discusses the system analysis process including the requirements definition and the methodology used to develop the system.

## 2.1 Requirements Elicitation

Requirements elicitation or requirements gathering is the process of researching the requirements of the system from the different types of users.

### 2.1.1 Functional Requirements

Functional requirements state what the system should do to which users and defines the services provided by the system:

- The user should search for the available room (based on price, hotel, city, and rating).
- The user should be able to cancel the reservation.
- The user should be able to put room booking details.
- The user should be able to pay online.
- The administrator should be able to insert hotels details.
- The administrator should be able to manipulate the system database.

### 2.1.2 Non-Functional Requirements

| | |
|---|---|
| **Usability** | The application should have an intuitive user interface that is easy to use. |
| **Availability** | The system should be available most of the time and updated automatically from the database. |
| **Security** | The system should be security and follow security best practices when handling user passwords, payments, and other user information. |

**Table 1** Non-functional requirements

## 2.2 Requirements Specification

Requirements specification is the process of recording the user and system requirements. It uses several ordered techniques that help understanding the requirements. These techniques include natural language or graphical representation. In this section, we will be using UML use case diagram to illustrate our requirements.

### 2.2.1 Use case diagram

The use case diagram presents the set of functionalities, different types of actors and their relationship. It describes the goal of the system and the actor interactions with the system.

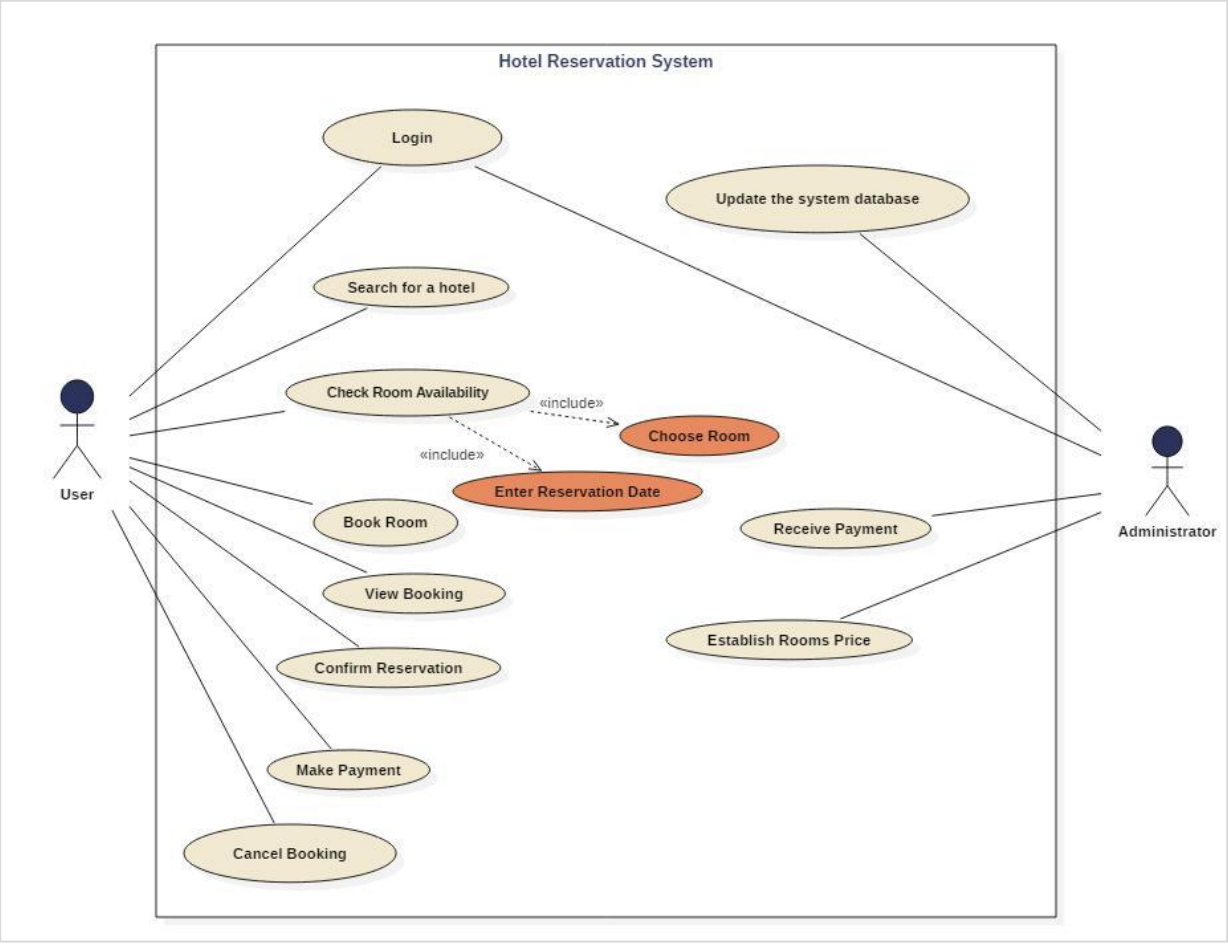



**Figure 3** Use case diagram

### 2.2.2 Use case description

| Use Case Name | Actors | Pre-condition | Post-condition | Use Case Description |
|---|---|---|---|---|
| Login | User and Admin | User must exist in the database | User is logged in | This use case describes that the user can log in to their account on the system using their corresponding username and password |
| Book Room | User | User must fill in the booking details | Room booking succeeded | This use case describes a user's booking of a room in a specific hotel for a period of time |
| Make Payment | User | The user must fill in the payment card information | Payment must be created and associated with the user's account | This use case describes the process of payment through the system |
| Cancel Booking | User | There should be a reserved room to be cancelled | The booking is cancelled | The use case allows the user to cancel booking |
| Update the system database | Admin | Admin exists on the system | System database is updated | The system administrator update the hotel information such as offers, discounts on rooms. When the user checkout from the hotel, the database need to update and show the availability to the new users |

**Table 2** Use case description

## 2.3 Developmental Methodology

To develop our project, we choose to follow the agile development methodology. Agile development is a methodology of developing software and working on a team that is iterates between cycles during the software development lifecycle.


**Figure 4** The agile model

We found agile development to best suit our need because it helps us focus on what needs to be done rather than planning an documenting, it is also suitable for delivering software projects in a limited period of time since most of the time is dedicated for development.

The project process in the agile lifecycle is as follows:

- **Plan:** In this stage, all the project features will be prepared, and know what will be built depending on the project delivery term.
- **Design:** At this stage, the design begins with the existing system and requirements structure and the UML design to visualize what needs to be followed during the development phase.
- **Development:** This stage adopts the system by starting to implement the database and application interfaces.
- **Testing:** The testing phase will only begin when the entire development process is complete, check to ensure that the app is running properly without errors and functions are working as expected.
- **Release:** A trial version of this stage of the product for users.
- **Feedback:** This stage is to collect feedback about the system from users and work to improve it

# 3. System Design

## 3.1 Object Oriented Design

The Object-Oriented Design is concerned with describing the static and dynamic operations of the system.

### 3.1.1 Structural Static Models

Structural model represents how the entities are organized in the system. The class diagram is the most commonly used model. It represents the elements and the relationship between them.

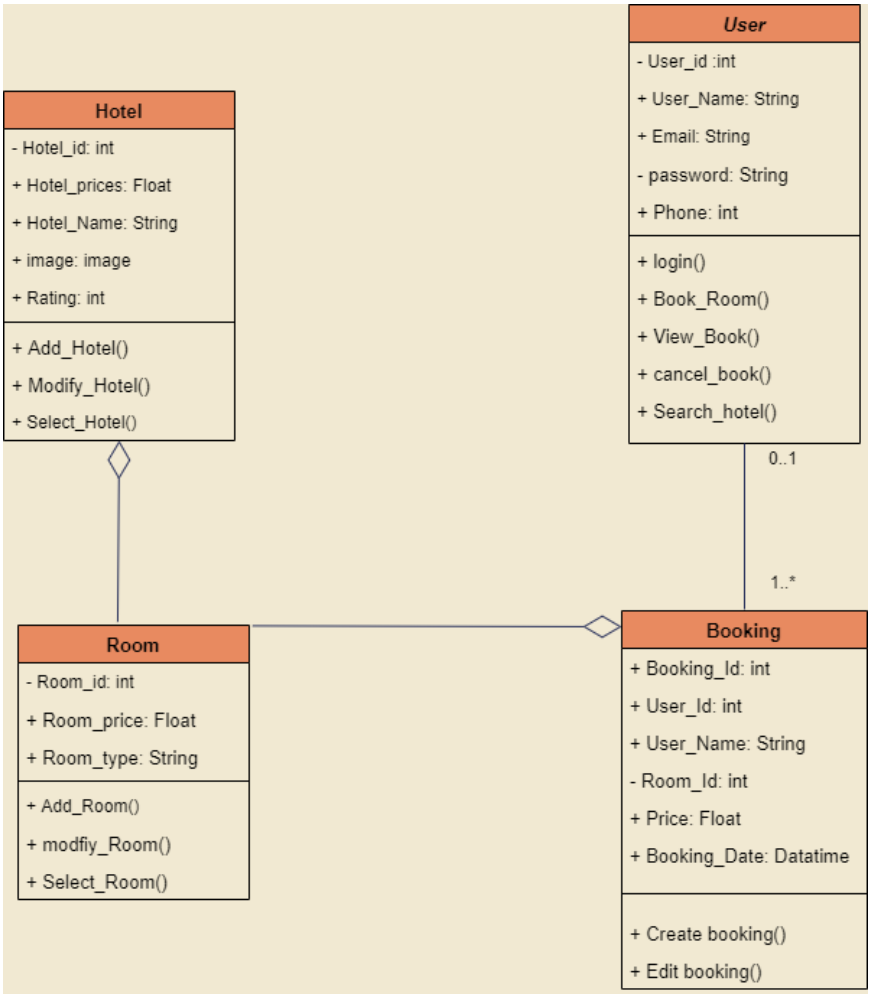



**Figure 5** Class diagram.

### 3.1.2 Dynamic Models

Activity diagram is a dynamic model that is used to show the control flow from the start circle to the end. It focuses on the consecutive functional activity of the system. Figure 6 starts with the sign up activity and shows the order of sequential functions.

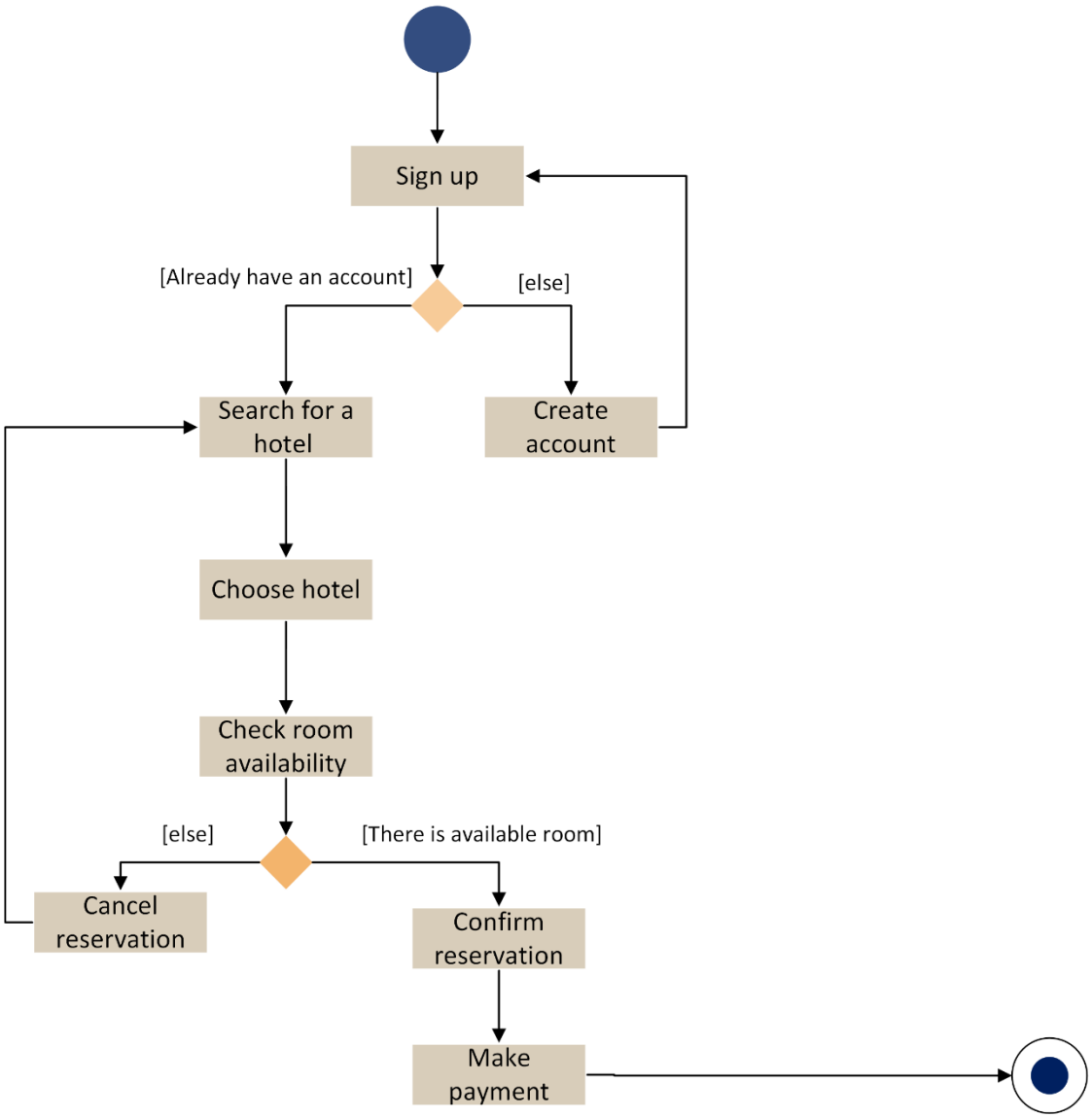



**Figure 6** Activity diagram.

## 3.2 Data Modelling

### 3.2.1 ER Diagram

Database design is organizing the data in models. This design is used to store and manage the data and their relationships in a database. Using database models makes it easier and simpler to read.

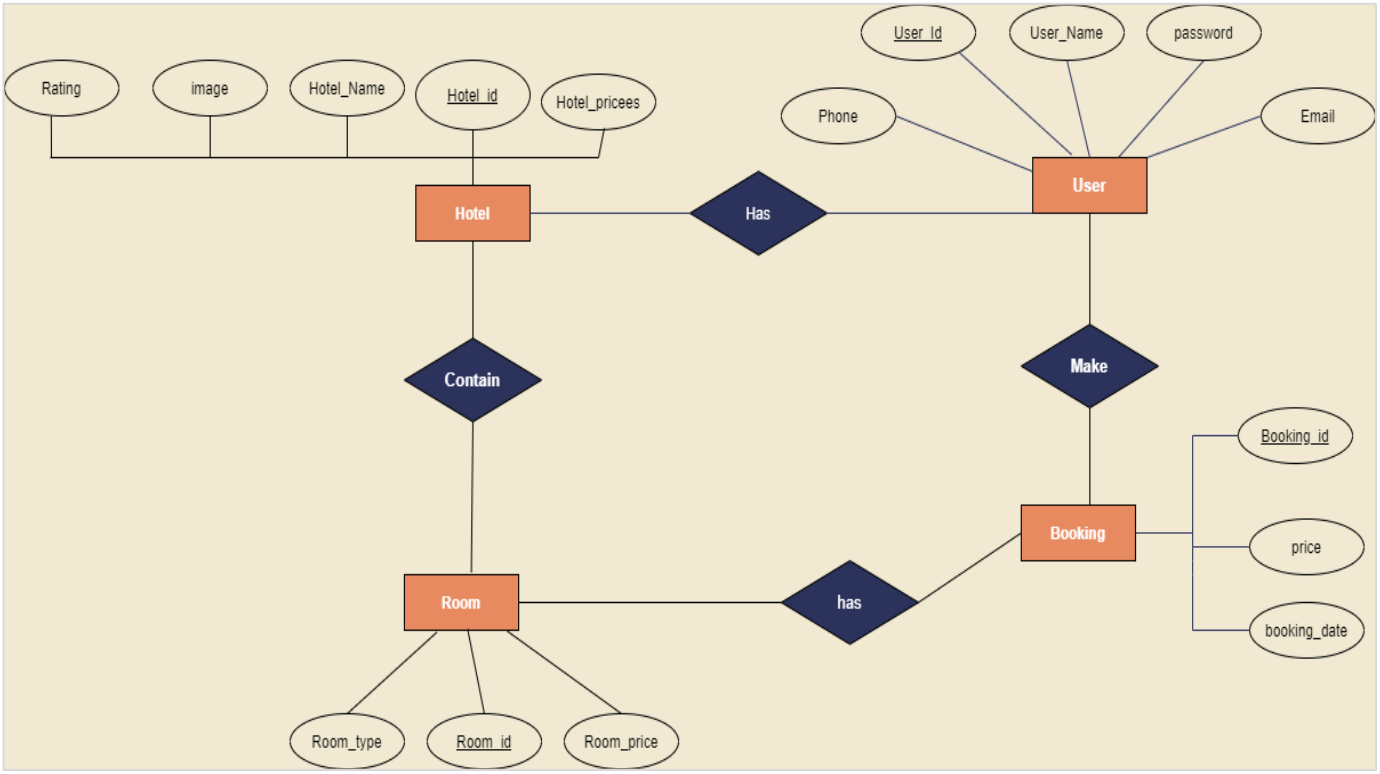



**Figure 7** ER diagram.

## 3.3 Project Map

The project site map used to show the activities within the application, and details each of these activities. The diagram provides information about all pages and shows the connections between them.

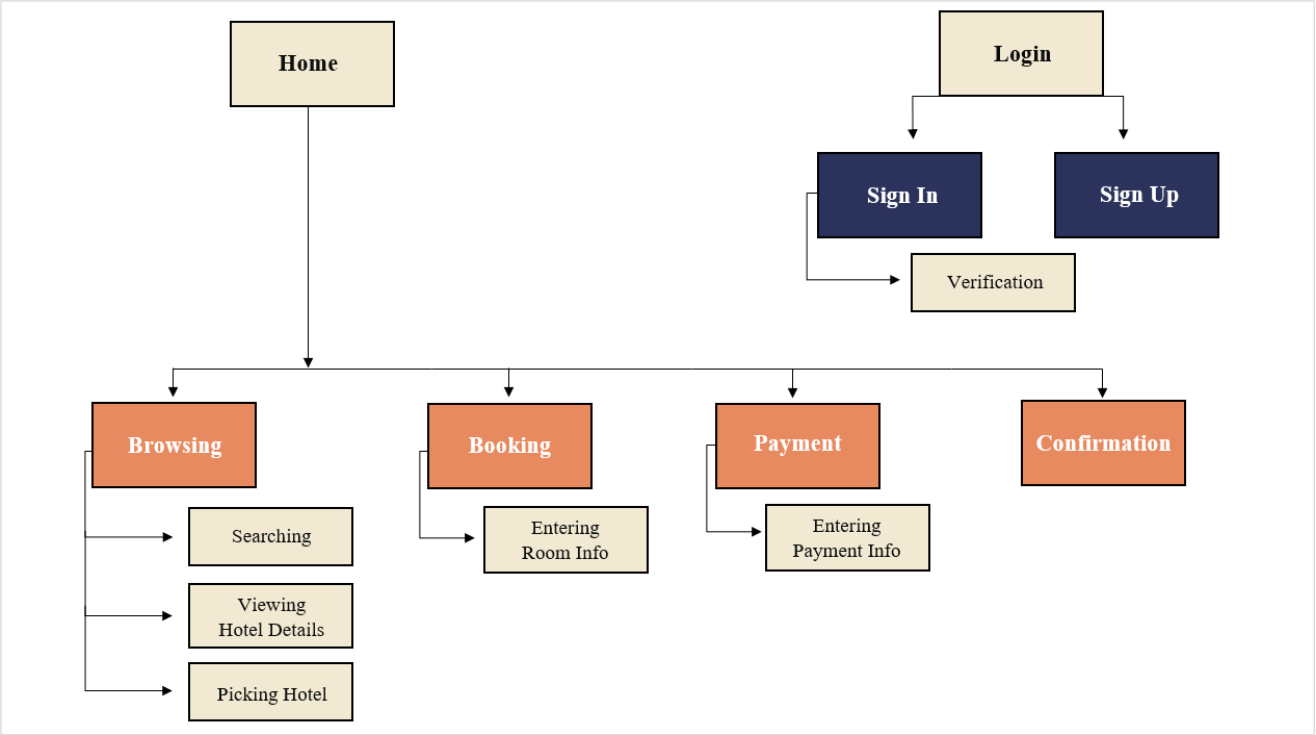
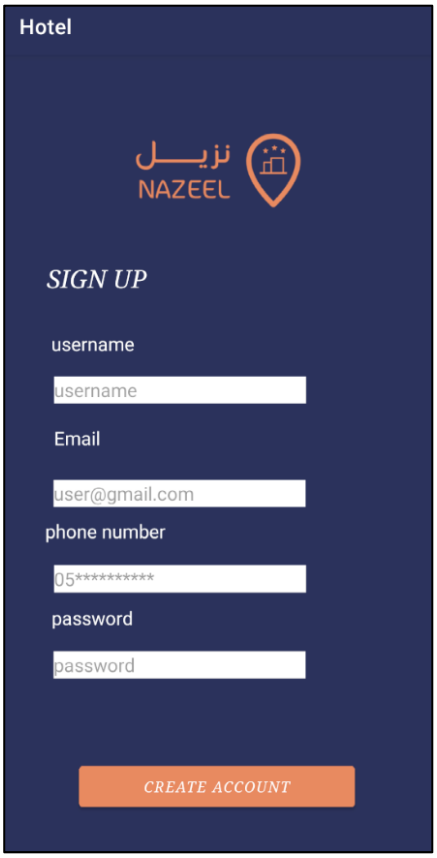
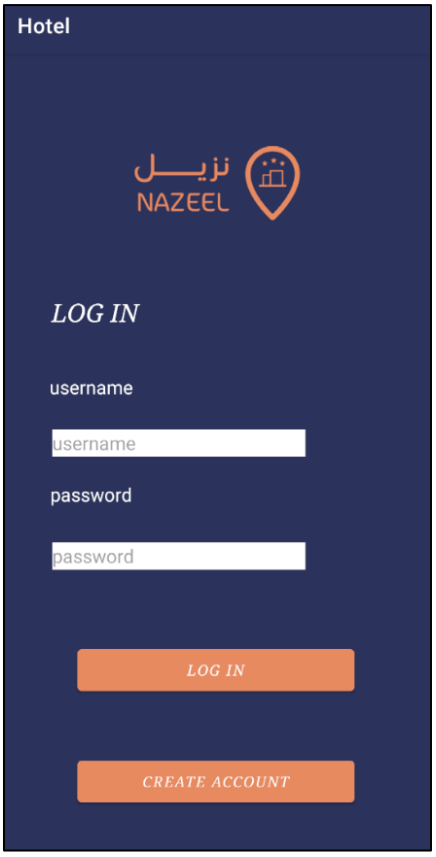
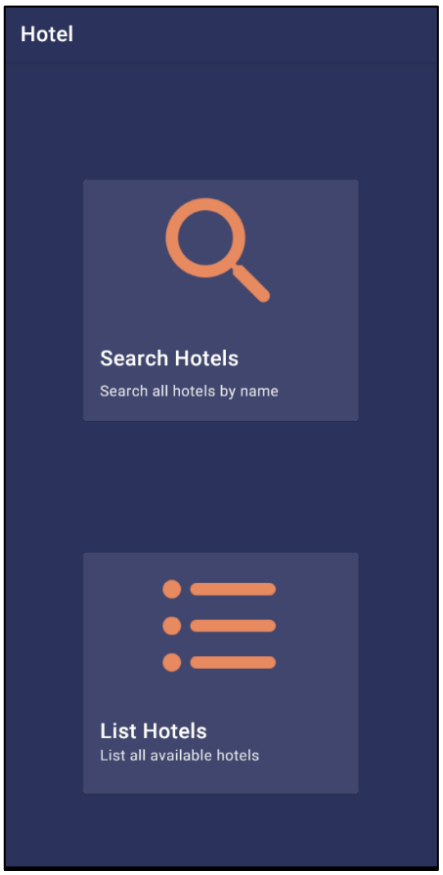


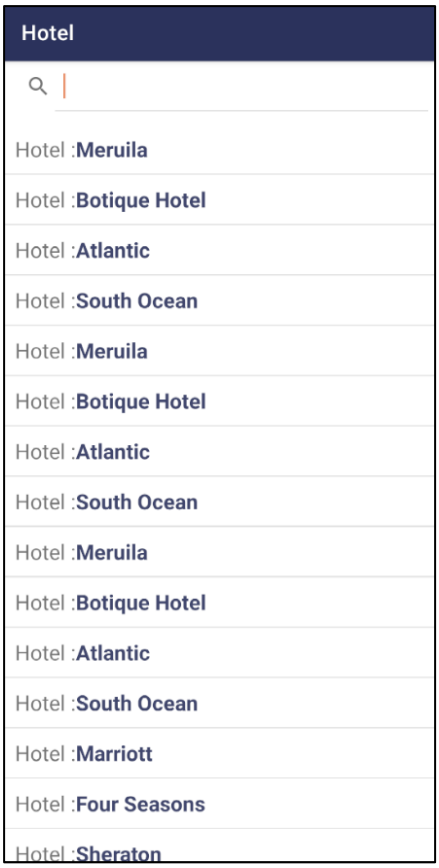

**Figure 8** Site map diagram.

## 3.4 User Interface Design



Hotel

**Meruila**
Bercelona
1.5km to city center
$168
per night

**Botique Hotel**
Berlin
0.5km to city center
$200
per night

**Atlantic**
Bercelon
1km to city center
$632
per night

**South Ocean**
Bercelona
3km to city center
$120
per night

**Meruila**
Bercelona
1.5km to city center
$168
per night

Hotel

*Meruila*

check in

Nov 07 2019
Dec 08 2020
Jan 09 2021

check out

Nov 07 2019
Dec 08 2020
Jan 09 2021

number of rooms 2

adult 2

children 4

NEXT

Hotel

*$168*

*credit card information*

card type visa,mada,etc

card number 1111 1111 1111 1111

expire date mm-yy

ccv 110

NEXT

Hotel

Done

Your reservation details

| | |
|---|---|
| **Hotel** | *Meruila* |
| **Rooms** | *1* |
| **Check in date** | *8-12-2020* |
| **Check out date** | *8-12-2020* |
| **Bill** | *$168* |

HOME

# 4. System Implementation

## 4.1 Tools and Languages

| *Name* | Logo | Use |
|---|---|---|
| *Android Studio* |  | Code editor environment to write and run codes for android projects. |
| *Genymotion* |   | Cross-platform Android emulator for running the application. |
| *Java* |  | Class-based, object-oriented programming language. |
| *XML* |   | Extensible Markup Language is a markup language that defines user interface components and proprieties. |
| *SQLite* |   | A library that implements SQL database engine. |
| *DB Browser (SQLite)* |  | Tool to create, design, and edit database files compatible with SQLite. |

**Table 3** Tools and languages.

# 5. System Testing

- In sign in, when user skip a field without filling it, sign in cannot be done, and a message shows up indicating the mistake. The same happens when user enters wrong username or password.
- If when user enters wrong data 3 times, the application will assume someone else is trying to enter the real user's account and will disable login button.

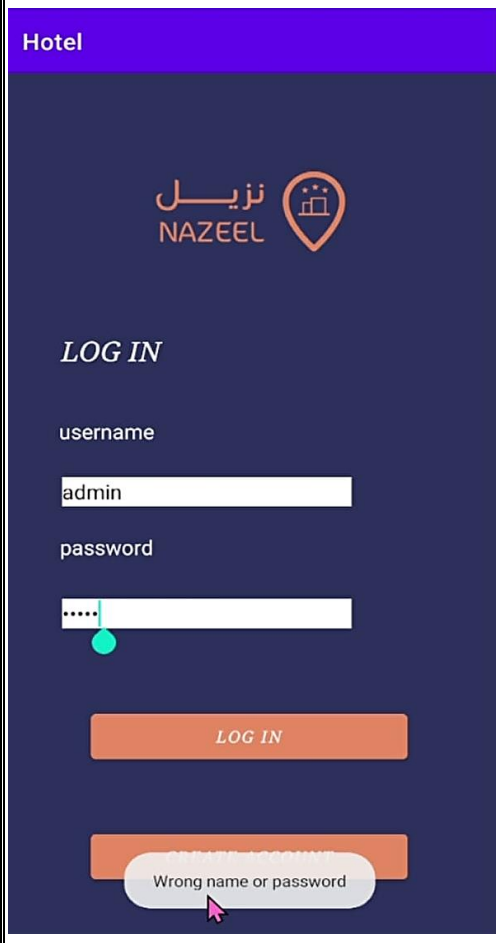



**Figure 9** Sign in test1.


**Figure 10** Sign in test2.


**Figure 11** Sign in test3.

- In sign up, room booking page, and payment page, when user skip a field without filling it, navigation cannot be done, and a message shows up indicating the mistake.

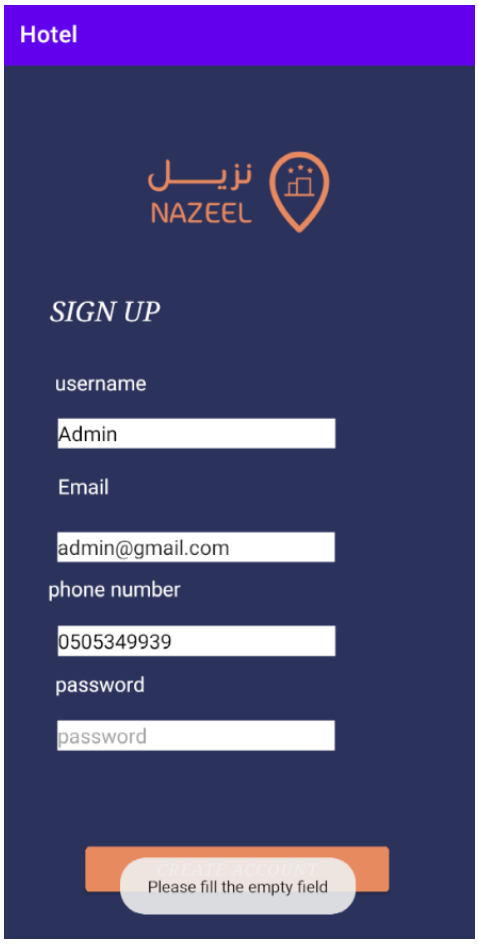



**Figure 12** Sign up test.

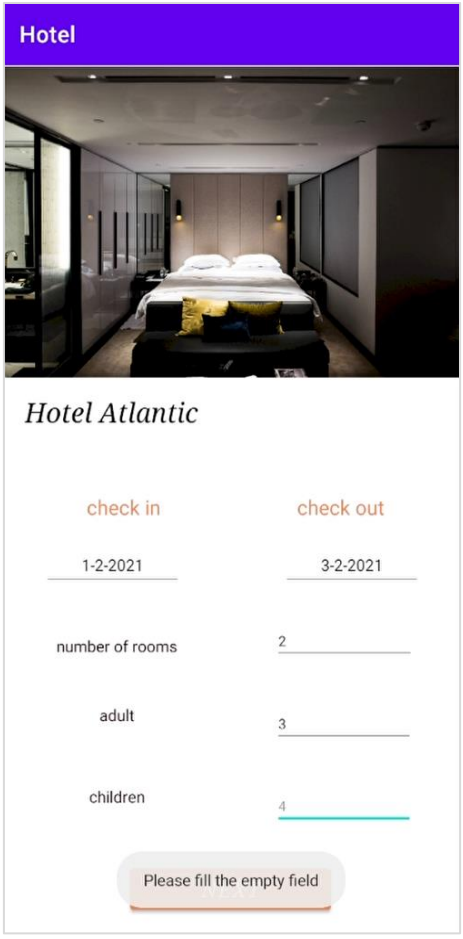



**Figure 13** Room booking test.

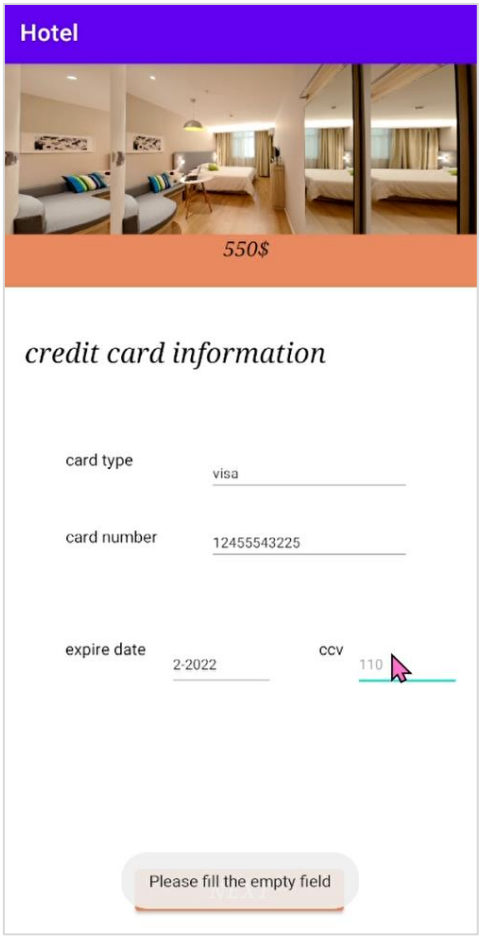



**Figure 14** Payment test.

- The right process to go:

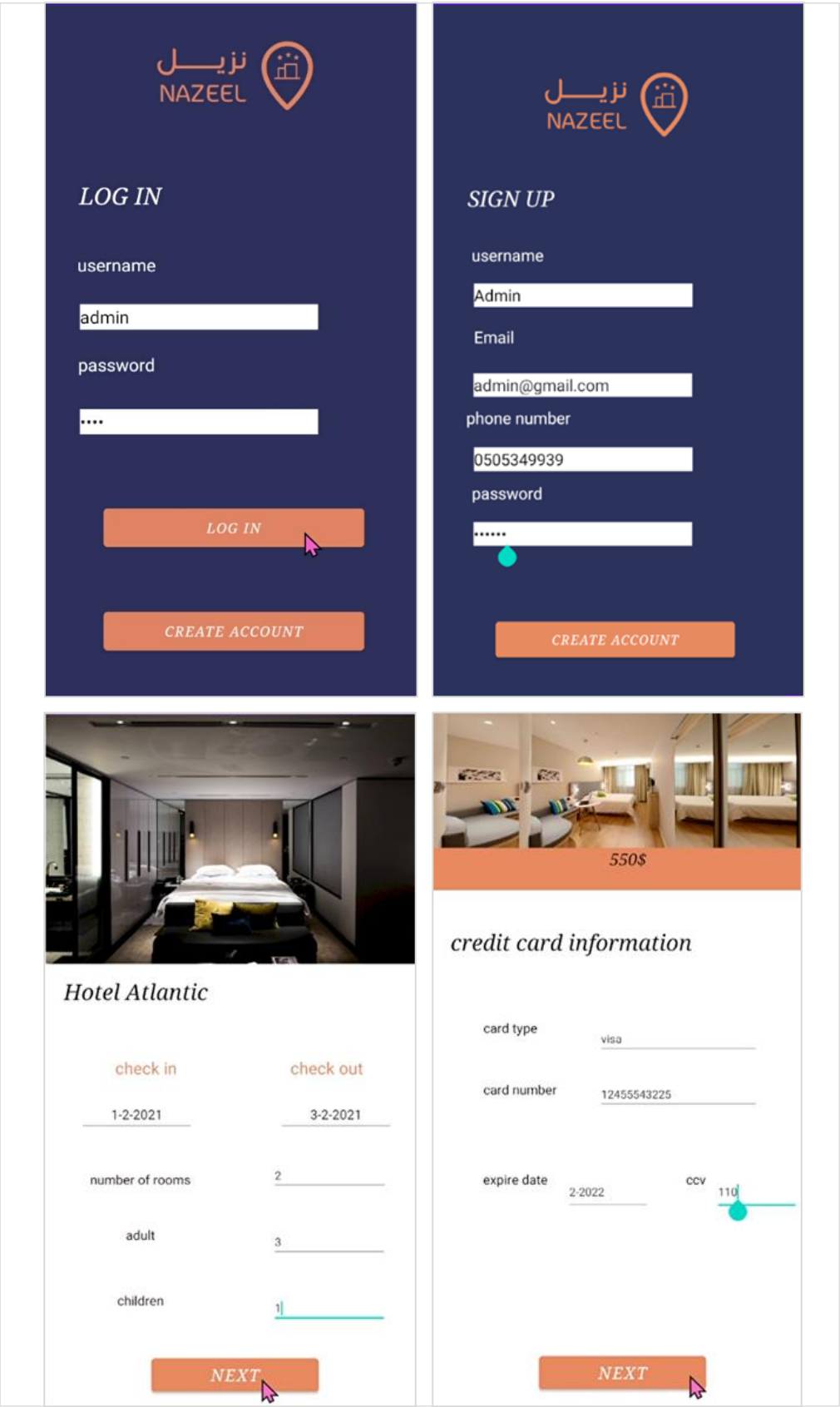



**Figure 15** The right test.

# 6. Conclusion and Future Work

## 6.1 Conclusion

The main purpose for this project was to develop a small hotel reservation application for android platform to help visitors in booking and paying for their choosing hotel. The project starts with the fourth main development phases (system analysis, system design, system implementation, and system testing and maintenance). The project results an easy to use application with a simple interface and the educational purpose was also achieved.

## 6.2 Goals Achieved

The main goals archived in this project was pre-decided and oriented including the following:

- Choosing the name and creating the logo.
- Dividing members tasks and project stages overtime.
- Introducing the project and placing its objectives and describing its benefits and functions.
- System analysis and use case diagram.
- System design with the structural and dynamic views.
- System implementation (front end and backend).
- System testing for all possible inputs.

## 6.3 Future Work

For the future improvements, the application is going to support all platforms other than android, and the hotel owner would be able to sign in as a user and insert the hotel after admin's permission, rather than inserting hotels by the admin himself.

# REFERENCES

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[2] Hadar, Y. (2019). “My Best Tips for Agile Data Science Research.” Towards Data Science. Viewed at: https://towardsdatascience.com/my-best-tips-for-agile-data-science-research-b40365cc979d