



UNIVERSITY OF MALAYA

TECHNICAL REPORT

WIX 1002 - Fundamentals of Programming

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Semester 1

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Requirements and Explanation of the assigned project

Our project requires us to do a hotel system that allows users to book the room and admin to manage the room.

In the booking system, the user should be able to:

- Register an account
- Login to the account
- Reset password
- View the rooms
- Sort the rooms
- Book the room if the date selected is available
- Make transactions
- Review the room

In the management system, the administrator should be able to:

- Login to admin account
- Edit the details of the room
- Add new rooms

Approach to solve the task

1. The project is separated into a few folder:

- a. Login
 - i. signUp
 - ii. Login
 - iii. ForgotPassword
 - iv. EmailReset
 - v. EmailReset2
- b. user
 - i. AdminPage
 - ii. ChangePassword
 - iii. customerPage
 - iv. UpdateProfile
- c. rooms
 - i. CheckinRoom
 - ii. CheckOutRoom
 - iii. ConfirmBooking
 - iv. Lists
 - v. Room
 - vi. RoomAvailable
 - vii. Roomlist
 - viii. SearchRoom
 - ix. SearchRoomCondition
 - x. TheModel
- d. transaction
 - i. Signup
 - ii. transactionHistory
 - iii. transactionlist

- e. service
 - I. LuckyHotel
 - Ii Update
 - Iii Database
 - Iv Selection
 - f. Review
 - i. rating
2. The project also have the extra features which can make out system better, so we decide to add a few extra features:
- a. Microsoft Azure(online database)
 - b. Graphical User Interface(GUI)
 - c. List of Image for every room
 - d. Email Confirmation
 - e. Exception Handling
 - f. Other feature: Generate invoice

Description for the solution

Login

signUp

Users are required to enter their personal information which are name, gender, birthdate, phone number, email, password, password reconfirmation, security question and the answer to sign up a new account.

Login

Users need to enter their email and password and choose the user type which consists of customer and admin. Users are not able to proceed to the next page if the email, password or user type entered are incorrect.

ForgotPassword

This class allows the user to reset their password by answering the security question they chose during the sign up process.

EmailReset

If the users have forgotten their answer for the security question, they can reset their password by using email. In this class, users need to enter their email address and a confirmation code will be sent to their email.

EmailReset2

After users enter the confirmation code, they are allowed to reset their password.

User

AdminPage

Admin can choose to manage the rooms and check the check in or check out records.

ChangePassword

The users can change their existing passwords by entering their old passwords for confirmation purposes and then key in their new passwords.

customerPage

This class accumulates all functions which the users can choose to change their profiles or password, view the room list and history(check their previous booking room and give reviews), search and book available rooms.

UpdateProfile

The users can update and save their personal details, including their names, genders, birthdates and phone numbers after logging into their accounts.

Rooms

CheckinRoom

This class used to check in the room when the customer came to the hotel.

CheckOutRoom

This class used to check out the room when the customer returned the key of the room.

ConfirmBooking

After customer chose the room, this class show all the details and calculate the total amount should be paid by the customer.

lists

This class gets the information using methods from the RoomAvailable class and adds it to the ArrayList.

Room

The administrators can add, update and delete room(s). To add a room, they should at least insert Room ID and price, choose the room type and upload the image to add the room successfully.

To prevent the admin upload something else which is not picture, we use:

- `FileNameExtensionFilter("*.IMAGE","jpg","gif","png")`
- `addChoosableFileFilter(filter)`

So that others file types will not be recognized.

There is also a jTable to show all the rooms in Lucky Hotel using:

- `(DefaultTableModel) jTable1.getModel()`
- `addRow(new Object[]{rs.getString(1)});`

Using these methods, jTable will get data from the database and show it row by row.

RoomAvailable

This class consists of instance variables, constructor and getter methods. The class is used to get the room information for the Roomlist class and SearchRoom class, so that we do not have to have the similar code in two different classes.

Roomlist

This class shows all the rooms in Lucky Hotel using jTable, the customers are allowed to sort ascending and descending according to the condition they choose, which are Amount of Guests, Amount of Bed, Price and Rating.

SearchRoomCondition

Let the customers type in the room id which was previously shown in the Roomlist. Customers are also required to choose the check in and check out date before viewing the details of the room.

SearchRoom

This class shows the details or information of the room and checks the availability of the room so that duplicate appointments will not occur. If the room is not available during the date the customers chose, then they are not allowed to press the BOOK button.

TheModel

This TheModel class is created with a few methods, such as getter methods to reduce the duplicated code when showing the data extracted from the database to the jTable

Transaction

transactionList

A class that contain all the variables needed for transaction which are String roomid, String roomtype, double total_pay, int noOfDay, Date checkindate, Date checkoutdate, Timestamp datetimeTransaction.

transactionHistory

This class shows all the transactions information in Lucky Hotel using jTable, the information are based on transactionList class and admin are allow to generate invoice to customers.

Signup

This class will show a page for users to enter the information for the transaction which are their credit card numbers, name on cards, credit card types, CCV numbers and expiration date of the cards as proof for the transaction. User should also enter the amount of the transaction for booking. If the amount is enough, the transaction is successful and the room will reserve for the customer and will not available for booking between the date.

Review

Rating

Users are required to rate from 1 to 5 and write a comment for the room. The data input by the users will be saved in the online database. The average rating and comments of each room will be shown in the roomlist.

Service

All the java files in this package assisting in updating the database, used to reduce the code reusability and also help in setting up the whole database.

Extra Features

1. Microsoft Azure(online database)

Online database is use to store a variety of data such as user information and booking record so that we can check the booking history and set the room available for the next booking.

2. Graphical User Interface(GUI)

Make the system more user friendly and can book their room easily

3. List of Image for every room

The images are added to let the customers can make better decision, to show the image, we use:

- `new ImageIcon(new ImageIcon(rooms.get(i).getImage()).getImage())`
 - The image can be shown in the pages when the customer is browsing the rooms.
- `.getScaledInstance(int width,int height, Image.SCALE_SMOOTH)`
 - This method let us set the width and height of the image and make it fit the JLabel.

4. Email Confirmation

The user will get a verification code through email if he forgot his password. After entering the correct verification code, the user can set his new password.

5. Exception

When we are doing our project, there are some cases we need to catch the exception and we tried to catch some specific exception, which are:

- **ParseException**
 - This exception checks whether the String can be parsed into a different specific format. In our project, we caught this exception when we tried to parse the String into double and also to the Date format to calculate the number of days the customers booked and the price they needed to pay.
- **SQLException**
 - This exception is caught and gives the information when there are errors connecting to the database.
- **NullPointerException**
 - This exception is a runtime exception that occurs when a variable accessed is not pointing to any object and refers to nothing. We caught this exception to make sure that no information is left out as null and must be filled.
- **FileNotFoundException**
 - This exception is caught when there is an error when we try to access a file. In our project, this exception is caught when we want to generate the invoice using the `FileOutputStream()`.
- **HeadlessException**
 - We tried to catch this exception when calling `JOptionPane`.
- **MessagingException**
 - This exception was caught when we tried to send a verification message to the email.
- **DocumentException**
 - This exception is caught when we are trying to output the pdf file using `PdfWriter.getInstance(document,fileOutputStream)`

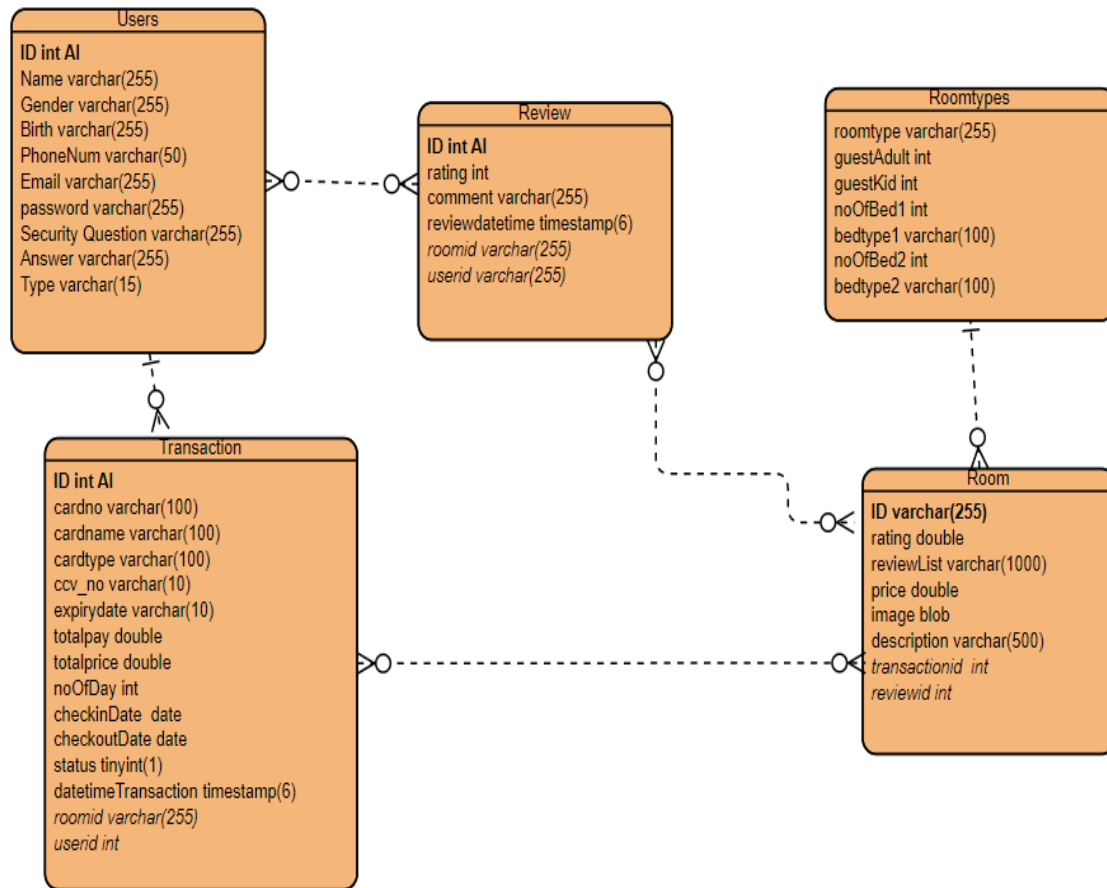
6. Other feature : Generate invoice

A special feature is added for the user to generate an invoice after the payment is done. The invoice consists of all the information needed:

- room id
- room type
- total payment
- number of days
- check-in date
- check-out date
- transaction time

The invoice will be generated in pdf form.

Entity Relation Diagram



Note: bold=primary key, *italic* = foreign key

Basically, the program consists of five main entities as mentioned in the assignment. Each entity represents each table that we need to create in the database. We have to create all the tables in the database, and link them accordingly. Symbol like one to one, one to many, many to one, and many to many in the ERD used as guidelines for us to create the project.

Sample Output

SIGN UP

Name

Gender

Birthdate

Phone number

Email

Password

Password reconfirmation

Security Question

Answer

SIGN UP

Name

Gender

Birthdate

Phone number

Email

Password

Password reconfirmation

Security Question

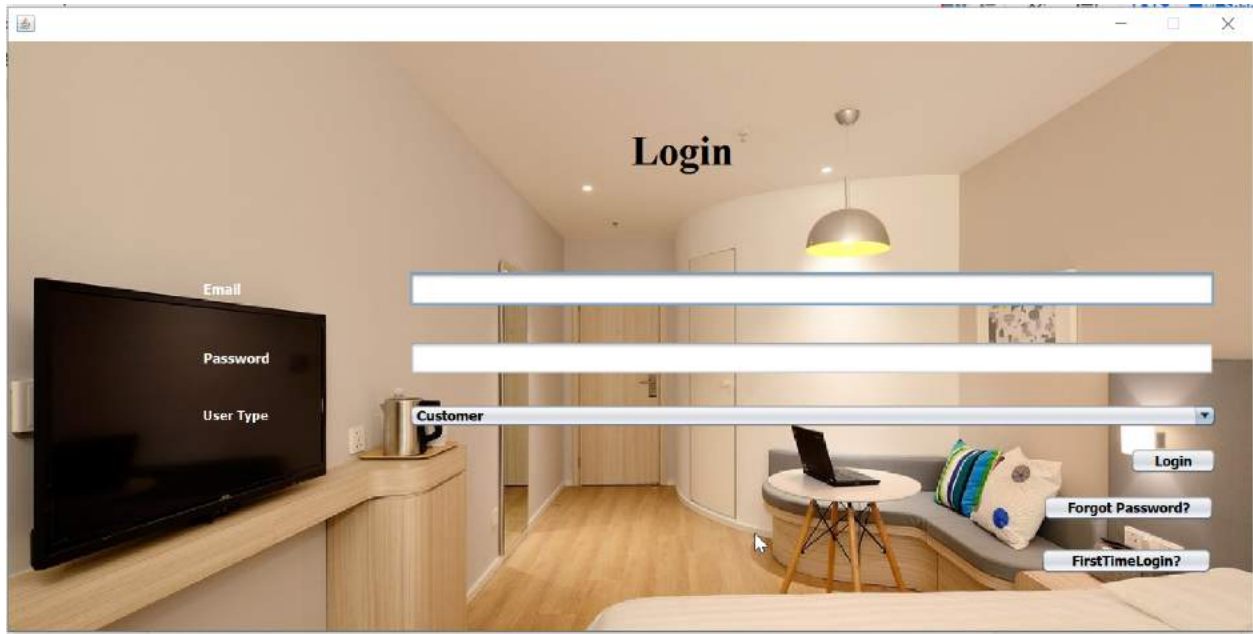
Answer

Message

i Not a valid email! Valid email: abc@mail.xxx

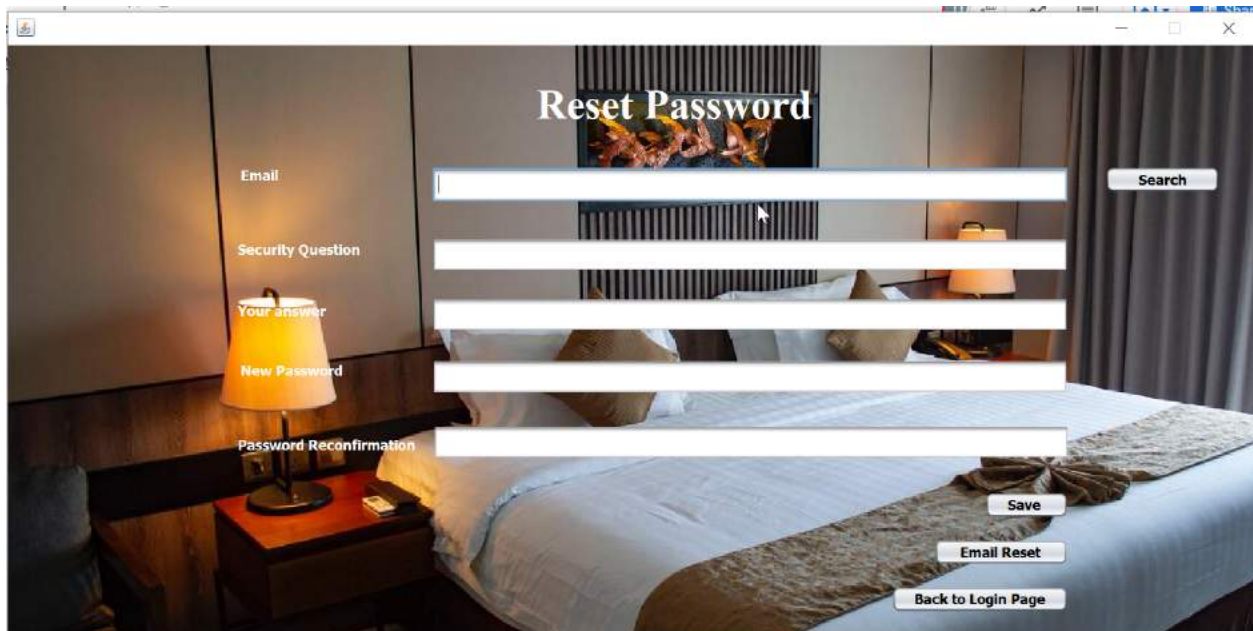
Sample for sign up page

We have set some limits like email format only applicable to the email section using Java Regex. We also set up a limit of length 8 to password to ensure a strong password provided by the user. To ensure users remember their password, we set up two sections for that for the user to reconfirm.



Sample for login page

We set up a login page which requires users to input their email and password to reconfirm their credentials. The user can register a new account by click on 'FirstTimeLogin' and can reset their password in 'forgot password'.



Reset Password

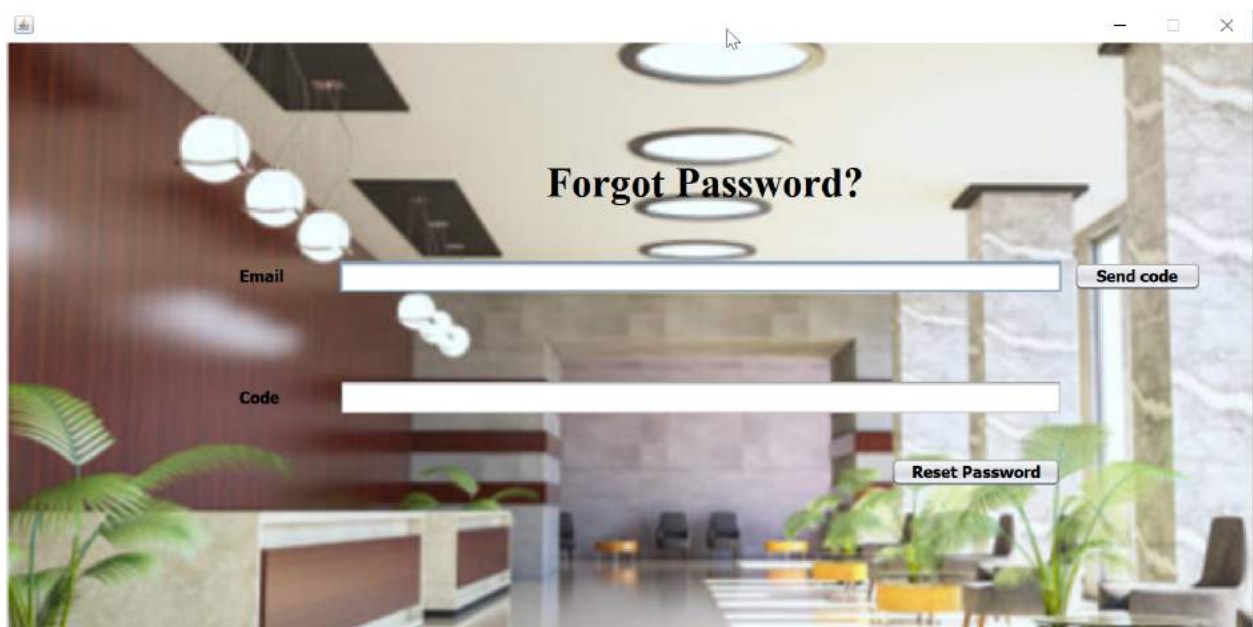
Email

Security Question

Your answer

New Password

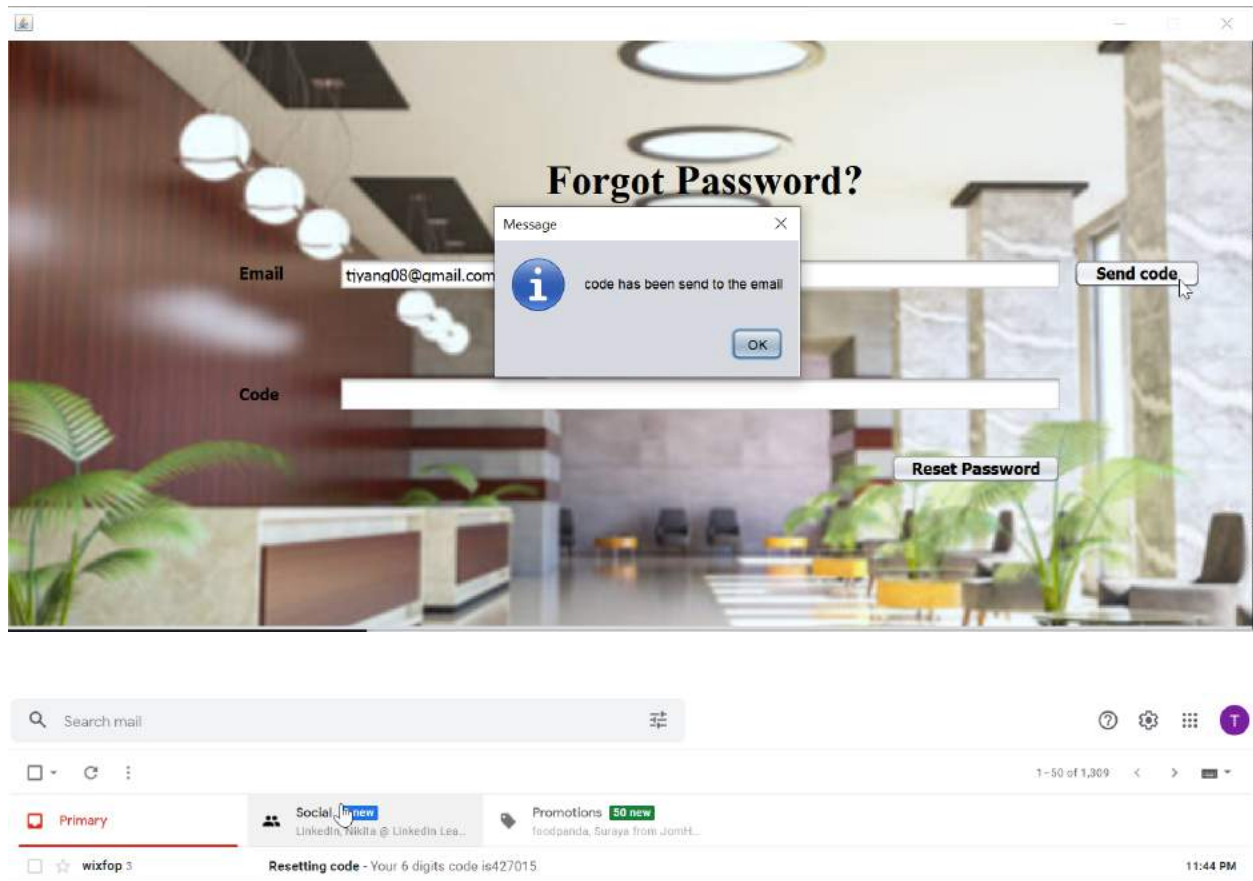
Password Reconfirmation



Forgot Password?

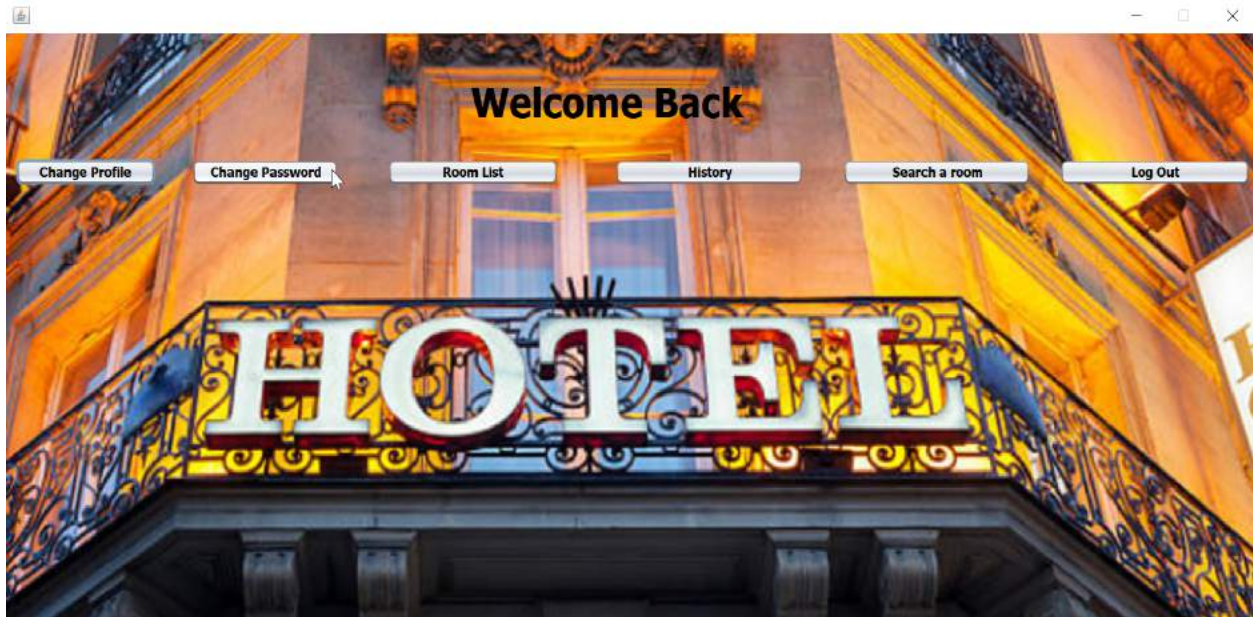
Email

Code

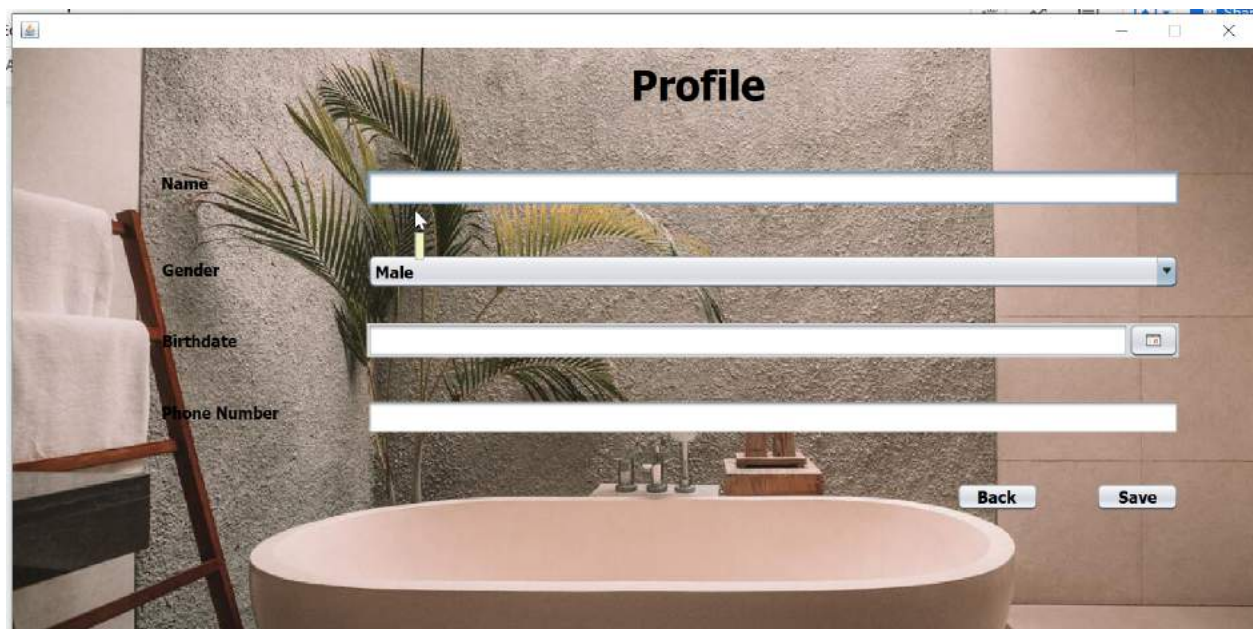


Sample for reset Password pages

We provided two ways to reset users' forgotten password, one is by security question set up and another is by email reset.



Sample for customer Page. This page stores all the functionalities that can be performed by the customer.



Sample for change profile page. Back button is to return to the customer page.

The image shows a web browser window with a 'Change Password' form. The background is a photograph of a modern hotel building at night, with its lights reflecting on the water. In the foreground, there are lounge chairs and umbrellas. The form is a dark grey overlay with white text and input fields. It contains three input fields: 'Old Password', 'New Password', and 'New Password Reconfirmation'. Below these fields are two buttons: 'Back' and 'Save'.

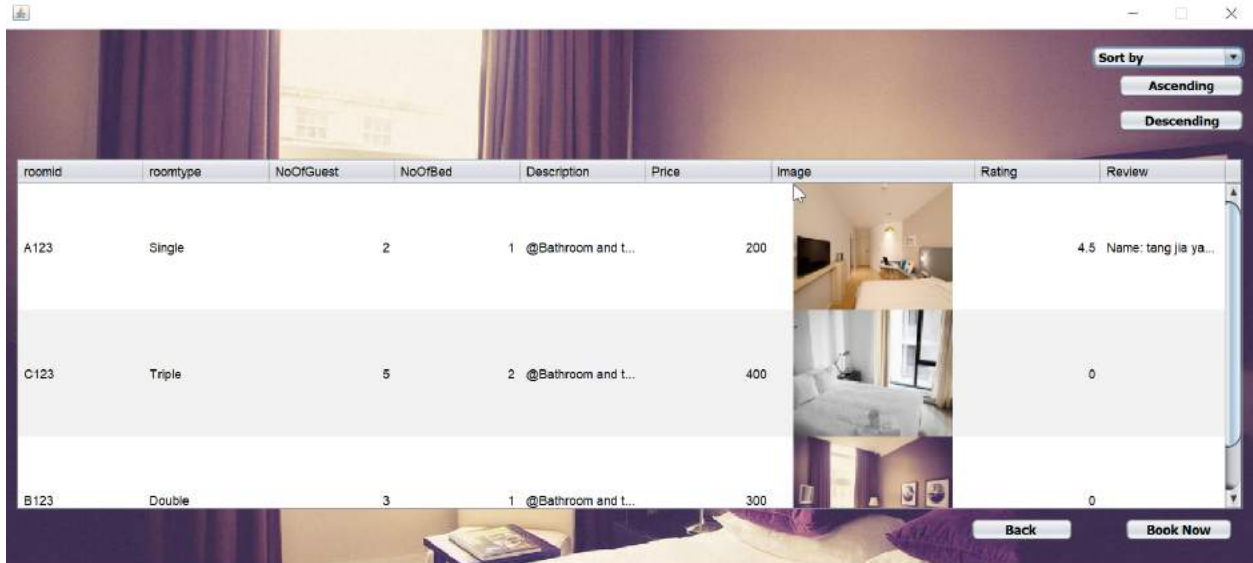
Change Password




Old Password

New Password

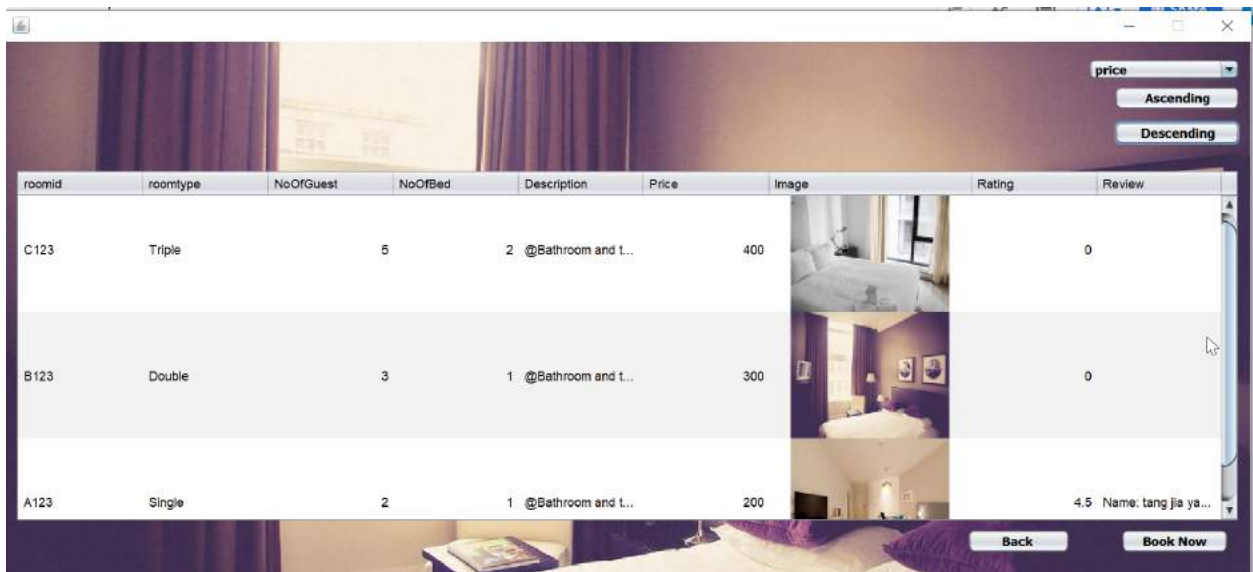
New Password Reconfirmation




Sample for change password page. Users are required to have their old password to change to a new one. Again, 'back' assists in return to the customer home page.



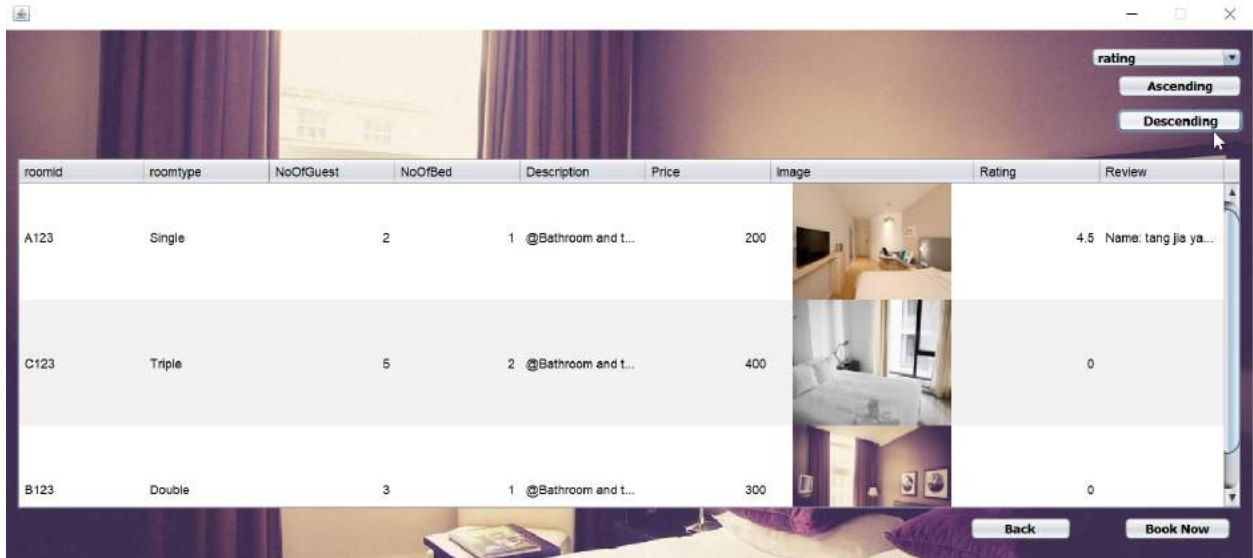
roomid	roomtype	NoOfGuest	NoOfBed	Description	Price	Image	Rating	Review
A123	Single	2	1	@Bathroom and t...	200		4.5	Name: tang jia ya...
C123	Triple	5	2	@Bathroom and t...	400		0	
B123	Double	3	1	@Bathroom and t...	300		0	

Sample room list for the customer to refer. Users can sort according to characteristics they want. 'Back' redirects to the customer page. 'Book' redirects to 'Searching room condition' page.



roomid	roomtype	NoOfGuest	NoOfBed	Description	Price	Image	Rating	Review
C123	Triple	5	2	@Bathroom and t...	400		0	
B123	Double	3	1	@Bathroom and t...	300		0	
A123	Single	2	1	@Bathroom and t...	200		4.5	Name: tang jia ya...




Sample descending sorting according to price.



rating

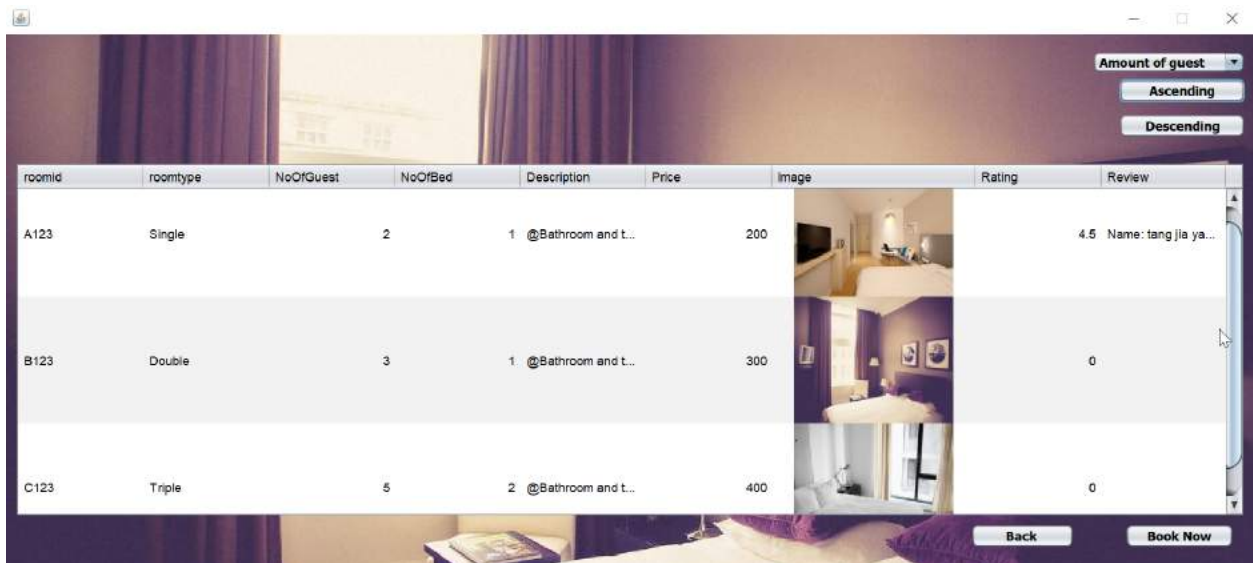
Ascending

Descending

roomid	roomtype	NoOfGuest	NoOfBed	Description	Price	Image	Rating	Review
A123	Single	2	1	@Bathroom and t...	200		4.5	Name: tang jia ya...
C123	Triple	5	2	@Bathroom and t...	400		0	
B123	Double	3	1	@Bathroom and t...	300		0	

Back Book Now




Sample Descending sorting according to rating.



Amount of guest

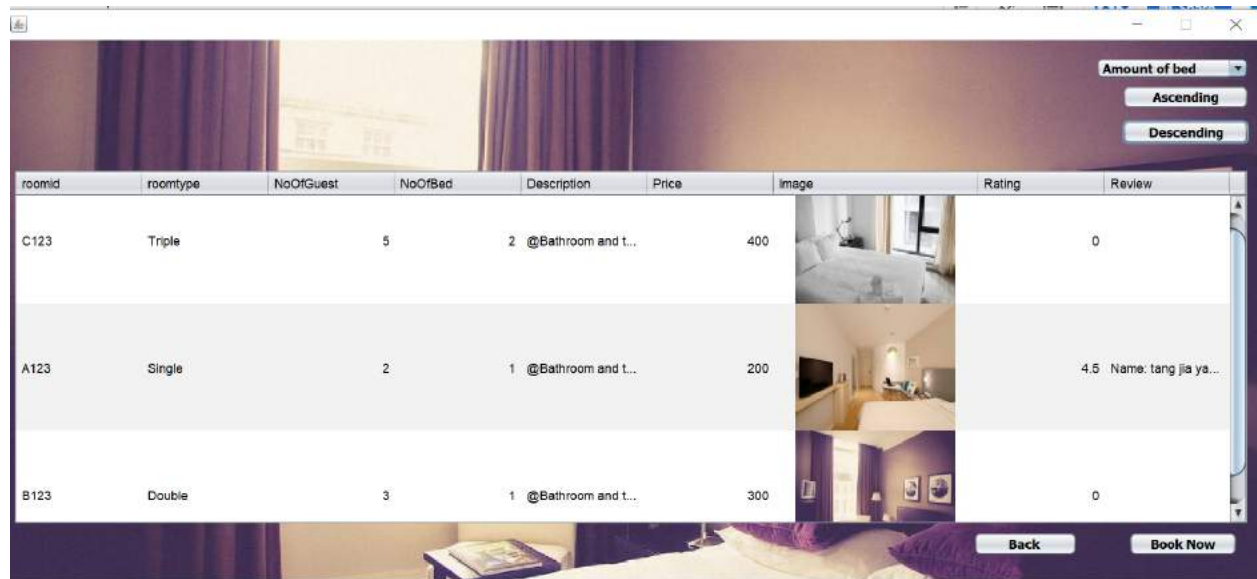
Ascending




Descending

roomid	roomtype	NoOfGuest	NoOfBed	Description	Price	Image	Rating	Review
A123	Single	2	1	@Bathroom and t...	200		4.5	Name: tang jia ya...
B123	Double	3	1	@Bathroom and t...	300		0	
C123	Triple	5	2	@Bathroom and t...	400		0	

Back Book Now

Sample 'Ascending order' according to the amount of guest accommodatable.



roomid	roomtype	NoOfGuest	NoOfBed	Description	Price	image	Rating	Review
C123	Triple	5	2	@Bathroom and t...	400		0	
A123	Single	2	1	@Bathroom and t...	200		4.5	Name: tang jia ya...
B123	Double	3	1	@Bathroom and t...	300		0	

Amount of bed:
Ascending
Descending

Back Book Now

Sample sorting amount of bed in descending order.

Search Room:

Room ID [Show Details](#)

Room Type

Check In Date

Check Out Date

No of adults

No of kids

No of Bed

Max Price Per Day RM

[View All Room](#) [Show This Room](#)

Sample for Search Room Condition Page. Users can Key in any room they want according to room id. If they wish to check for a room list they can click on “view all rooms”. “Show this room” button will be enabled once user key in Roomid and click on show details. Users also need to key in the date they want.

Searching Room [BACK](#)

Room ID [Show Details](#) No of adults No of Bed

Room Type No of kids Max Price Per Day RM

Check In Date Check Out Date [Show This Room](#) [View All Room](#)

ROOM AVAILABLE

Room ID A123 **Room Type** Single **Max Guest (Adult)** 1 **Max Guest (Kid)** 1

Bed 1 Single

Description
 @Safety and Security Feature@
 Smoke detector
 Security feature
 @Clothing and laundry@
 Closet
 @Additional Description@
 Just Refurnished!

Review
 Name: tang jia yang
 Rating: 4
 Comment: I type this now
 Name: tang jia yang
 Rating: 5
 Comment: New comment Lets see t

Price Per Day 200.0 **Rating** 4.5

This Room is NOT Available during your Check In and Check Out Date.

[FIRST ROOM](#) [PREVIOUS ROOM](#) [Book](#) [NEXT ROOM](#) [LAST ROOM](#)

Sample ‘Searching Room page’ when user insert date that is not available.

SEARCH ROOM

Searching Room

BACK

Room ID

A123

Show Details

No of adults

1

No of Bed

1

Single

Room Type

Single

No of kids

1

Max Price Per Day

RM

200.0

Check In Date

Jan 25, 2022

Check Out Date

Jan 28, 2022

Show This Room

View All Room

ROOM AVAILABLE

Room ID

A123

Room Type

Single

Max Guest (Adult)

1

Bed

1 Single

Description

@Safety and Security Feature@

Smoke detector

Security feature

@Clothing and laundry@

Closet

@Additional Description@

Just Refurnished!

Price Per Day

200.0

Review

Name: tang jia yang

Rating: 4

Comment:I type this now

Name: tang jia yang

Rating: 5

Comment:New comment Lets see t

Rating

4.5

FIRST ROOM

PREVIOUS ROOM


Book

NEXT ROOM

LAST ROOM

Sample page when user enters date that not yet booked by any customer. Also, user can perform any of the functionality like ‘View All Room’ that returns to the roomlist page, ‘sorting function’ that includes a few sorting, ‘back’ button that returns to the search room condition page, ‘book’ button that directs to the confirmation page. Some room details like user comment and rating are also available here, average rating, price per day, description, number of guests, number of beds and pictures for the room.

Confirm Booking



Room ID

A123

Room Type

Single

Number of Adult

1

Number of Child

1

Bed

1 Single

Description

Towels

Air Conditioning

Check In Date

22/01/2022

Check Out Date

24/01/2022

Price Per Day

RM 200.0

Total Price

RM 400.0

Book!

Booking confirmation page. This page will display all the details of the room, and the details the user entered like check in date, check out date, total price and so on. 'Book' button will lead to the transaction page.

The screenshot shows a web application window titled "Transaction". At the top left, it displays "User ID: 3" and at the top right, "Total: 400.0". The background is a night-time image of a modern building with lights. In the center, there is a light gray form with the following fields: "Credit card number:" (empty), "Name on card:" (empty), "Credit card type:" (a dropdown menu showing "Visa"), "CVV" (empty), "Expiry Date:" (empty), and "Total pay:" (empty). At the bottom of the form are two buttons: "Confirm" and "Cancel".

This screenshot shows the same "Transaction" page, but the form is now filled with data: "Credit card number:" is "1234123412341234", "Name on card:" is "tang jia yang", "Credit card type:" is "Visa", "CVV" is "123", "Expiry Date:" is "1212", and "Total pay:" is "400". The "Confirm" and "Cancel" buttons are still present. A small "Message" dialog box is overlaid on the right side of the form, containing an information icon, the text "Booking Successfully", and an "OK" button.

User transaction Page. Users need to key in their details in order to book successfully. There are few restrictions made, like credit card number must be 16digits, and CCV number must be 3 digits, total pay must also be the same as total shown in above section. Once the user key in everything is correct it will direct the user to the transaction history

page. If the user enters cancel, it will redirect the user to the customer page and the user has to key in again. Cancel indicates a failed transaction.

The screenshot displays a web application interface. At the top, there is a table titled 'Transaction History' with the following data:

RoomID	RoomType	TotalPay	NoOfDay	CheckInDate	CheckOutDate	TransactionTime
A123	Single	400.0	2	2022-01-17	2022-01-19	2022-01-17 22:17:12.823345
A123	Single	600.0	3	2022-01-19	2022-01-22	2022-01-17 22:21:10.379302
A123	Single	600.0	3	2022-01-25	2022-01-28	2022-01-18 00:13:24.728219

Below the table is a form for adding a new transaction. The form fields are:

- Name: tang jia yang
- Room ID: [empty]
- Room Type: [empty]
- Total Pay: [empty]
- No Of Day: [empty]
- Check In Date: [empty]
- Check Out Date: [empty]

On the right side of the form, there are three buttons: 'Rate it', 'Delete', and 'Generate Invoice'. At the bottom right, there is a 'Back to Home' button.

The screenshot shows a PDF document titled 'Invoice1.pdf'. The document contains the following information:

Invoice

Name: tang jia yang

RoomID: A123

RoomType: Single

TotalPay: 600.0

NoOfDay: 3

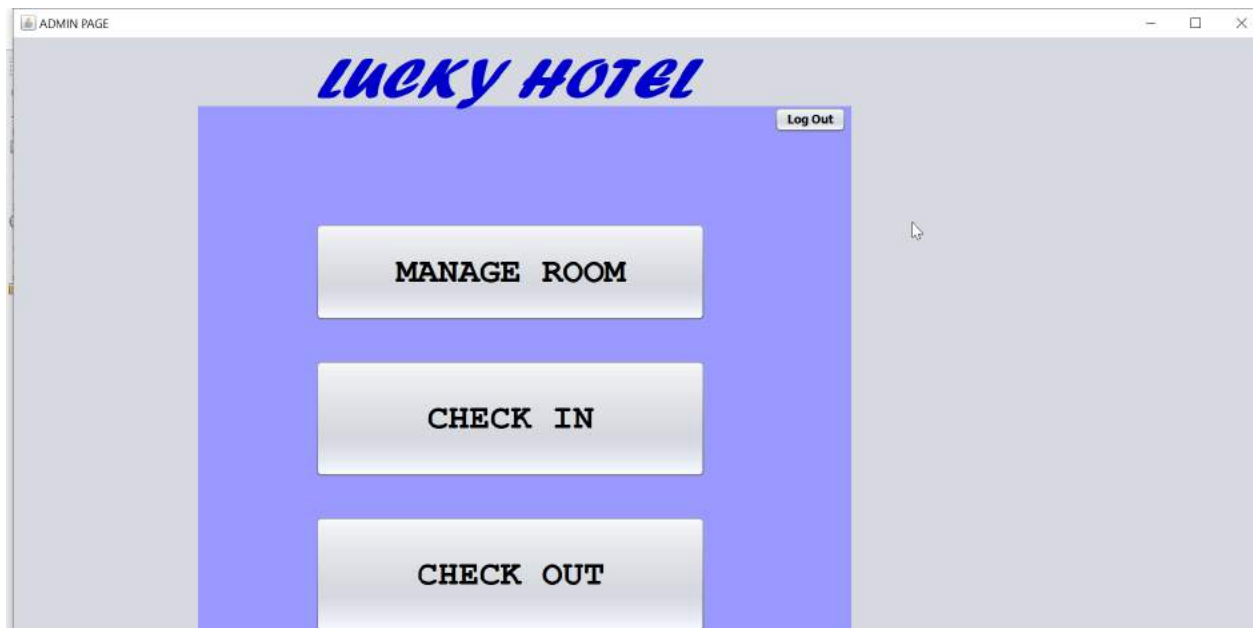
CheckInDate: 2022-01-19

CheckOutDate: 2022-01-22

TransactionTime: 2022-01-17 22:21:10.379302

Transaction History page. Users can rate the room once a transaction is done. Click on the rate it will direct to the rating page. If the user clicks on delete, the transaction record will

be deleted. If clicked on generate invoice in a pdf form. 'Back to home' directs the user back to the customer page.



If a user entered as admin, they are able to perform three functions: manage rooms, check in users and check out users.

MANAGE ROOM

MAIN PAGE

ROOM

ROOM ID:

ROOM TYPE:

BED TYPE:

AMOUNT OF GUEST: ☐ ADULTS & CHILDREN

PRICE: RM

DESCRIPTION

Bathroom and toiletries

☐ Bathrobes ☒ Hair dryer ☒ Towels ☒ Mirror ☐ Bathtub

☐ Adapted bath

Comforts

☒ Air Conditioning ☐ Alarm Clock ☐ Blackout curtains ☐ Humidifier

☐ Linens ☐ Slippers ☐ Soundproofing ☐ Wake-up service

ADDITIONAL DESCRIPTION:

IMAGES: (MAX SIZE: 1MB)

Room ID	Room Type	Guests	No of Beds	Bed Type	No of Beds	Price	Description	Rating	Review
A123	Single	1	1	Single	0	200	@Bathroom a...	4.5	Name: tang
C123	Triple	3	2	Queen	1	400	@Bathroom a...	0	
B123	Double	2	1	Queen	0	300	@Bathroom a...	0	

Manage room page. Users can add rooms, delete and update the room details. Note, the maximum size of the picture is only 1 MB.

CHECK IN ROOM

MAIN PAGE

Check In

CUSTOMER ID:

CUSTOMER NAME:

MOBILE PHONE:

EMAIL ADDRESS:

GENDER:

BIRTHDAY:

ROOM ID:

ROOM TYPE:

PRICE PER DAY: RM

CHECK IN DATE:

CHECK OUT DATE:

Customer ID	Customer Name	Mobile Number	Email	Gender	Birthday	Room ID	Room type	Room Price	Check In	Status
3	tang jia yang	0134610329	tyang08@gm...	Male	2022-01-03	A123	Single	200	2022-01-17	3
3	tang jia yang	0134610329	tyang08@gm...	Male	2022-01-03	A123	Single	200	2022-01-19	1
3	tang jia yang	0134610329	tyang08@gm...	Male	2022-01-03	A123	Single	200	2022-01-25	1
3	tang jia yang	0134610329	tyang08@gm...	Male	2022-01-03	B123	Double	300	2022-01-18	2

If the admin clicks on the selected row, it can change the status of the customer to 2. 2

indicates check in. Note: Check in date must be the same as the user computer's date on that time.

Customer ID	Customer Name	Mobile Phone	Email Address	Gender	Birthday	Room ID	Room Types	Price	Check in	Status
3	tang jia yang	0134610329	tyang08@gmail.com	Male	2022-01-03	A123	Single	200	2022-01-17	3
3	tang jia yang	0134610329	tyang08@gmail.com	Male	2022-01-03	A123	Single	200	2022-01-19	1
3	tang jia yang	0134610329	tyang08@gmail.com	Male	2022-01-03	A123	Single	200	2022-01-25	1
3	tang jia yang	0134610329	tyang08@gmail.com	Male	2022-01-03	B123	Double	300	2022-01-18	2

Check out Page. Admin can select on the row they want, and the system will calculate the price for the customer. This is useful when the customer requests to check out earlier than the booking date. For example, user books date from 11- 13 January but he/she decides to leave earlier like on day 12. The system will calculate 11-12 January price only instead of what customers book on the booking page. Once clicked on the check out date, customer status will change to 3 indicating the user successfully checked out.

CHECK OUT ROOM

MAIN PAGE

Check Out

CUSTOMER ID: 3 ROOM ID: A123 SEARCH

CUSTOMER NAME: tang jia yang

MOBILE PHONE: 0134610329

EMAIL ADDRESS: tjyang08@gmail.com

CHECK IN DATE: 2022-01-17

CHECK OUT DATE: 2022-01-18

Single

1

RM 200.0

TOTAL PRICE RM 200.0

CHECK OUT

Customer ID	Customer Name	Mobile Phone	Email Address	Gender	Birthday	Room ID	Room Types	Price	Check In	Status
3	tang jia yang	0134610329	tjyang08@gmail.com	Male	2022-01-03	A123	Single	200	2022-01-17	3
3	tang jia yang	0134610329	tjyang08@gmail.com	Male	2022-01-03	A123	Single	200	2022-01-19	1
3	tang jia yang	0134610329	tjyang08@gmail.com	Male	2022-01-03	A123	Single	200	2022-01-25	1
3	tang jia yang	0134610329	tjyang08@gmail.com	Male	2022-01-03	B123	Double	300	2022-01-18	2

The cross button is to prevent the user accidentally clicking on that, the reconfirmation dialog to stop the program from bouncing out.

Others

Microsoft Azure

Search resources, services, and docs (G+)

Azure services

Create a resource

Azure Database for MySQL

Resource groups

Cost Management

All resources

SQL databases

Cost Management

Subscriptions

Storage accounts

More services

Recent resources

Name	Type	Last Viewed
Database changed		

```

MySQL [hoteldb]> show tables;
+-----+
| Tables_in_hoteldb |
+-----+
| review            |
| room              |
| roomtypes         |
| transaction       |
| users             |
+-----+
5 rows in set (0.218 sec)

```

Proof of online database being used.