Real Estate Rental Company

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Chapter 1: Introduction

Introduction

The “Real estate rental Company” is being developed for tenants and owners to buy, sell, or find anything in their community.

In this community, goods are redistributed to fill new needs and become wanted another time, where these products are offered, sell, rented and all process within ways don’t require centralized institutions or middlemen.

This is what this application does, it provides more good opportunities for the owner and the tenant, replacing the lack of visual advertising on the streets and main roads and the tenants in ability to reach what he desired, and the owner’s failure to sell or rent more properties, which leads to some losses to the owners.

This application is considered a good intermediary and advertiser between the owner and the tenant.

Problem definition

There is always a problem for both owners and tenants in the absence of an integrated system that meets their needs. This is because in most cases, they face some secondary problems, **such as:**

1. Difficulty reaching a buyer or tenant.
2. Difficulty finding a location, price, space, and features that are suitable for the buyer or tenant, which leads to the tenant or buyer not reaching what they want.
3. Lack of trust and non-compliance with the laws and conditions agreed upon between the contracting parties.

System objectives

1. Build an integrated system that meets the needs of owners and tenants.
2. Provide good and frequent opportunities for owners to reach tenants and vice versa.
3. Make it easy for tenants to find what they want by specifying all the features they want.
4. Guarantee compliance with the laws and agreed conditions and prevent the loss of the rights of owners and tenants.

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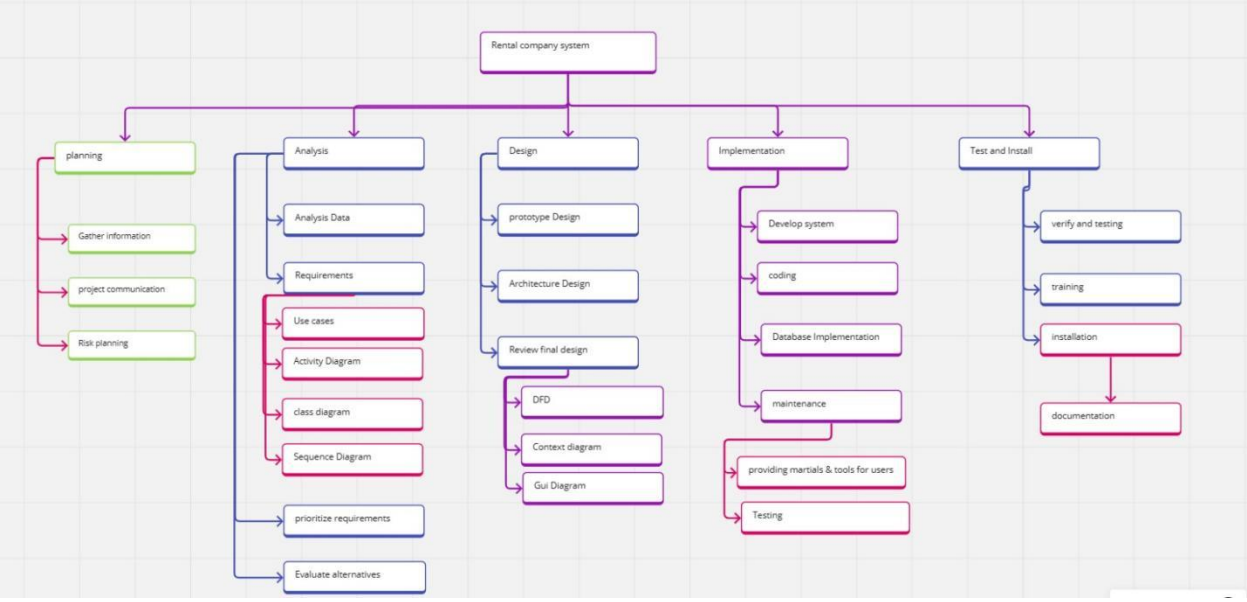
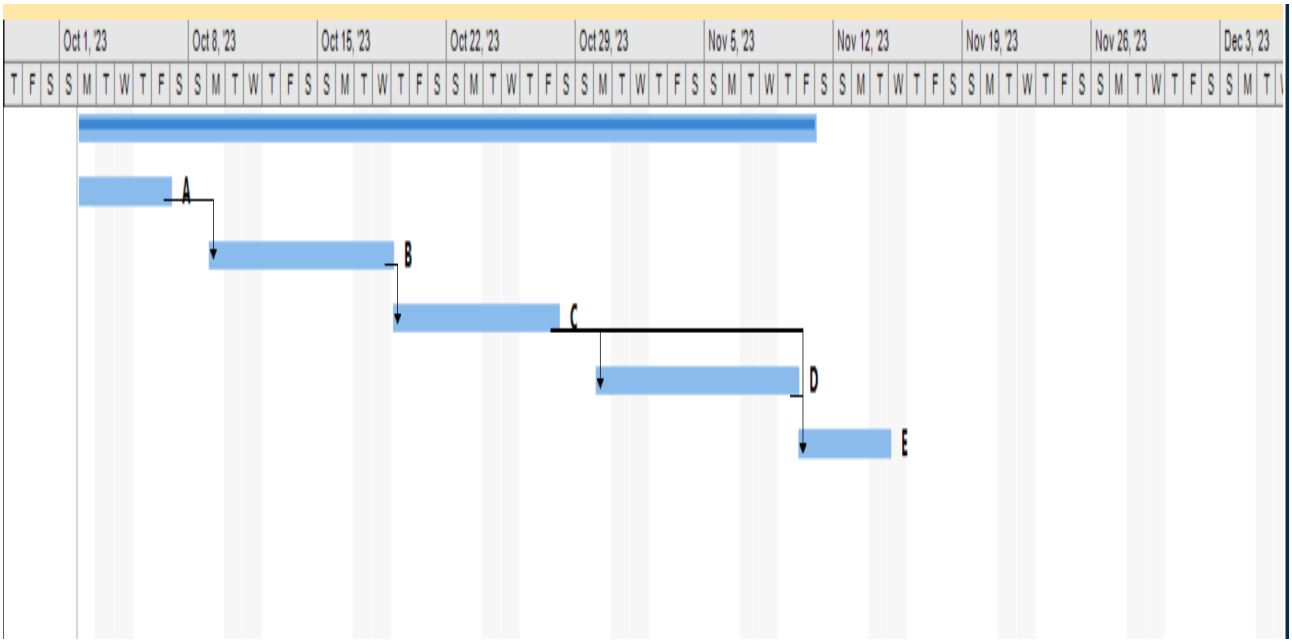


Gantt chart

	Task Name	symbol	Duration	Start	Finish	Work	Predecessors
1	Rental company systen		30 days	Mon 10/2/23	Fri 11/10/23	1,800 hrs	
2	Planning	A	5 days	Mon 10/2/23	Fri 10/6/23	40 hrs	
3	Analysis	B	8 days	Mon 10/9/23	Wed 10/18/23	64 hrs	2
4	Design	C	7 days	Thu 10/19/23	Fri 10/27/23	56 hrs	3
5	Implementation	D	9 days	Mon 10/30/23	Thu 11/9/23	72 hrs	4
6	Test and install	E	3 days	Fri 11/10/23	Tue 11/14/23	24 hrs	5,4



Project risks

There are many types of risks we can face, but we can make them included under two main types:

- Software Risks
- Hardware Risks

- ❖ Complex reservation and pricing models.
- ❖ Poor internet connection.
- ❖ Delivering imperfect customer service.
- ❖ Limitation of networks via information technology.
- ❖ Road networks, traffic control systems and intelligent mobility management systems.
- ❖ Advanced driver assistance, safety and autonomous vehicle systems.

Safety terminology

Term	Example
accident	An unexpected event / sequence due to a problem in the system, in some cases it may cause problem to the users and system.
Hazard	A condition with potential that causing mishap, Like failure of network that may make users unpleased by that.
Damage	Measure from loss that result from mishap, damage can occur in lack of money or error registration.
Hazard severity	Assessment of worst damage that result is ranged from high to low symptoms
Hazard probability	The incidence of this is very low, up to 3 or 4% because they always check system and its features
risk	The measure of the probability of the hazard occurring and system make accident, The risk of this happening very low

How to achieve safety

→ hazard avoidance

The system should contain notification and chats to detect problems or errors of system that may occur.

→ Hazard detection and removal

Continuous check of system action and functions.

→ Damage limitation

Creating regular backups of critical data to facilitate recovery in case of data loss or system failure.

Security terminology

Term	Example
Asset	the unit reservations for each customer that is receiving or has been received.
Exposure	Potential financial loss from customers who does choose any unit because they do not trust the application for maintaining their data.
Vulnerability	A weak password system which makes it easy for users to set guessable passwords. User ids that are the same as names.
Attack	An impersonation of an authorized user
Threads	An unauthorized user will gain access to the system by guessing the credentials (login username and password) of an authorized user.
Control	A password checking system that disallows user passwords that are proper names or words that are normally included in a dictionary.

How to achieve security

→ vulnerability avoidance

Using strong passwords that are a reasonable length with a combination of letters, numbers, and special characters and don't include dictionary words ensures that passwords can't be easily compromised.
Don't share passwords, every user should have their own username and password.

→ Attack detection and elimination

Install firewalls and intrusion detection systems to monitor and block unauthorized access attempts.

→ Exposure limitation and recovery

Backup your data regularly. That way, if there's any problem in the system, you will minimize the risk of losing all your data.

Chapter 2: System analysis

System requirements

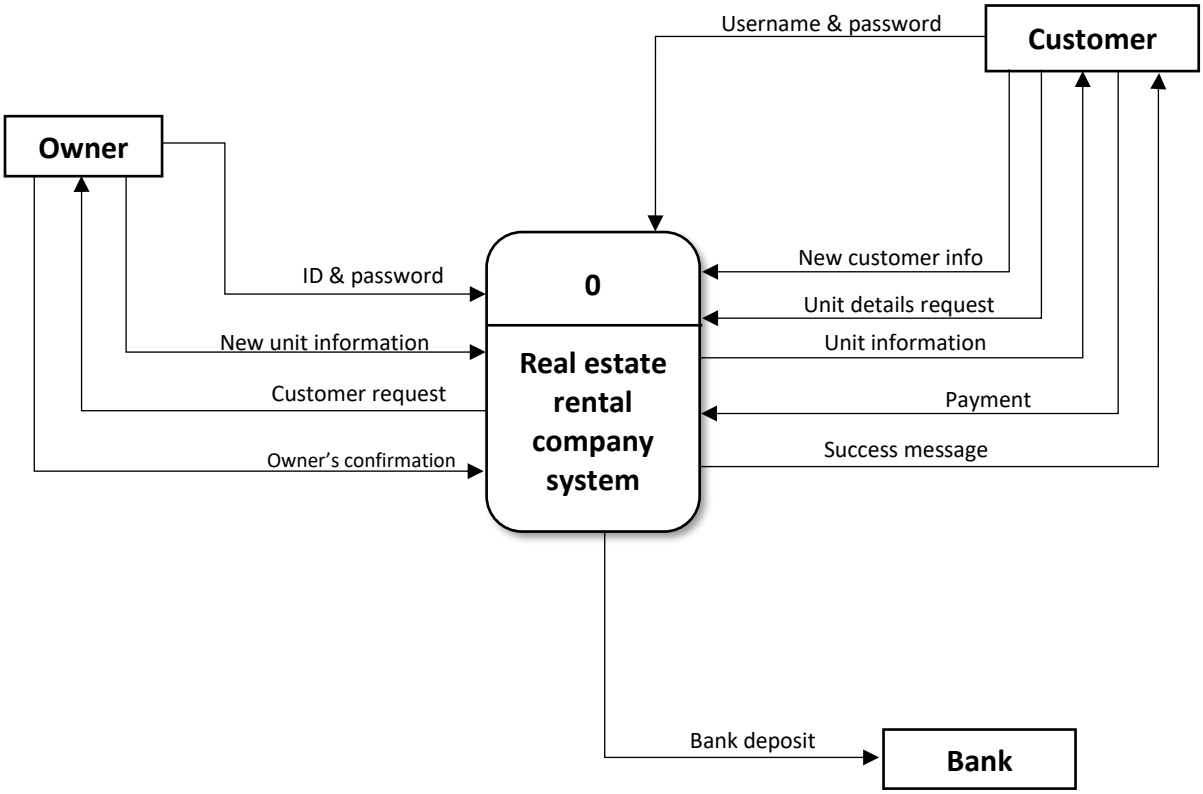
Functional Requirements:

1. Login to system. (customer & owner)
2. Search for vehicles. (customer)
3. Book vehicles for specific date and time. (customer)
4. Display available vehicles for rent. (owner)
5. Modify or cancel booking. (customer)
6. View detailed rental information. (owner)
7. Support secured online payment method. (customer)
8. Generate a report or receipt. (owner)
9. Update availability status in real-time when a vehicle is booked or returned. (owner)
10. Report any damages or issues with the rented. (User)

Non-Functional Requirements:

1. **Availability:** The system shall be available all the time.
2. **Maintainability:** The ability to maintain, modify information and update fix problems of the system.
3. **Appearance:** Provide an interface that enables users to deal with it easily.
4. **Response:** Ease and quick response when requesting a reservation and must take less than 3 seconds to response to order.
5. **Security:** provide secure entry to users.
6. **Correctness:** Bug free software which fulfills the correct need/ requirements of the client.

Context diagram



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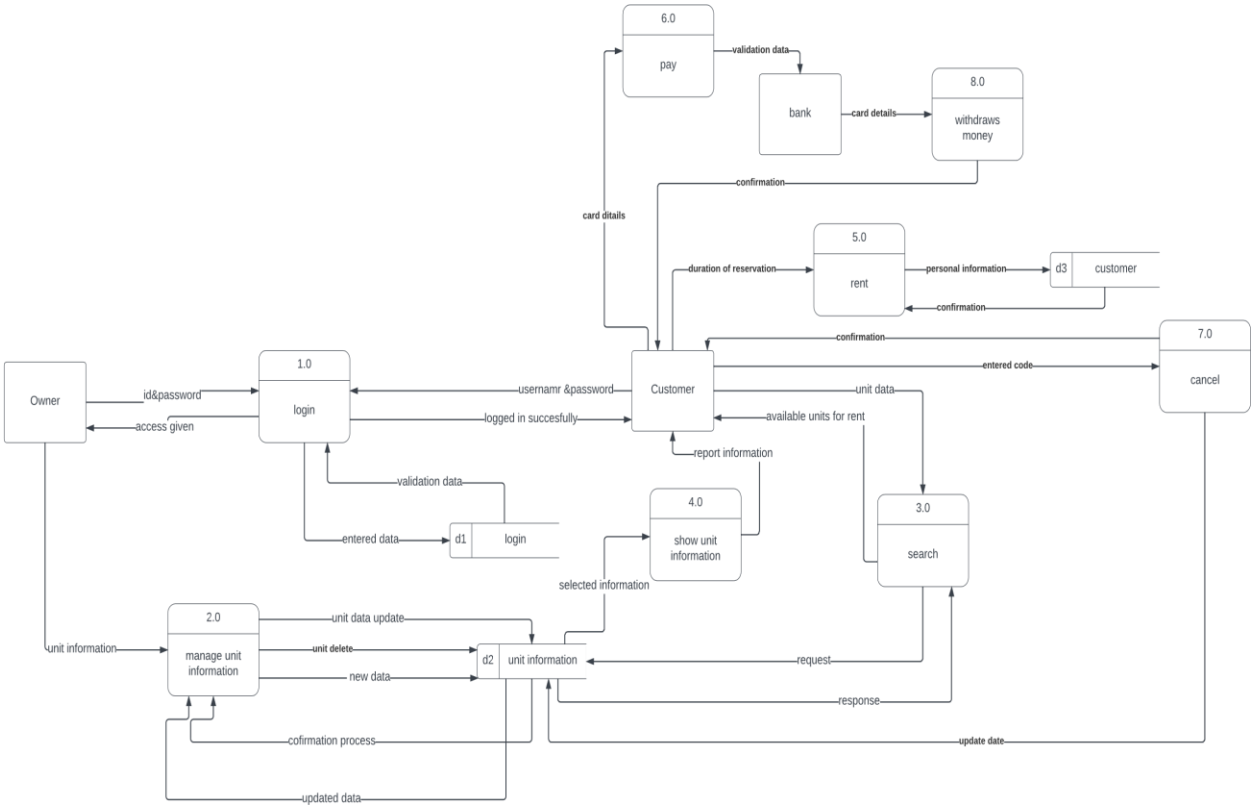
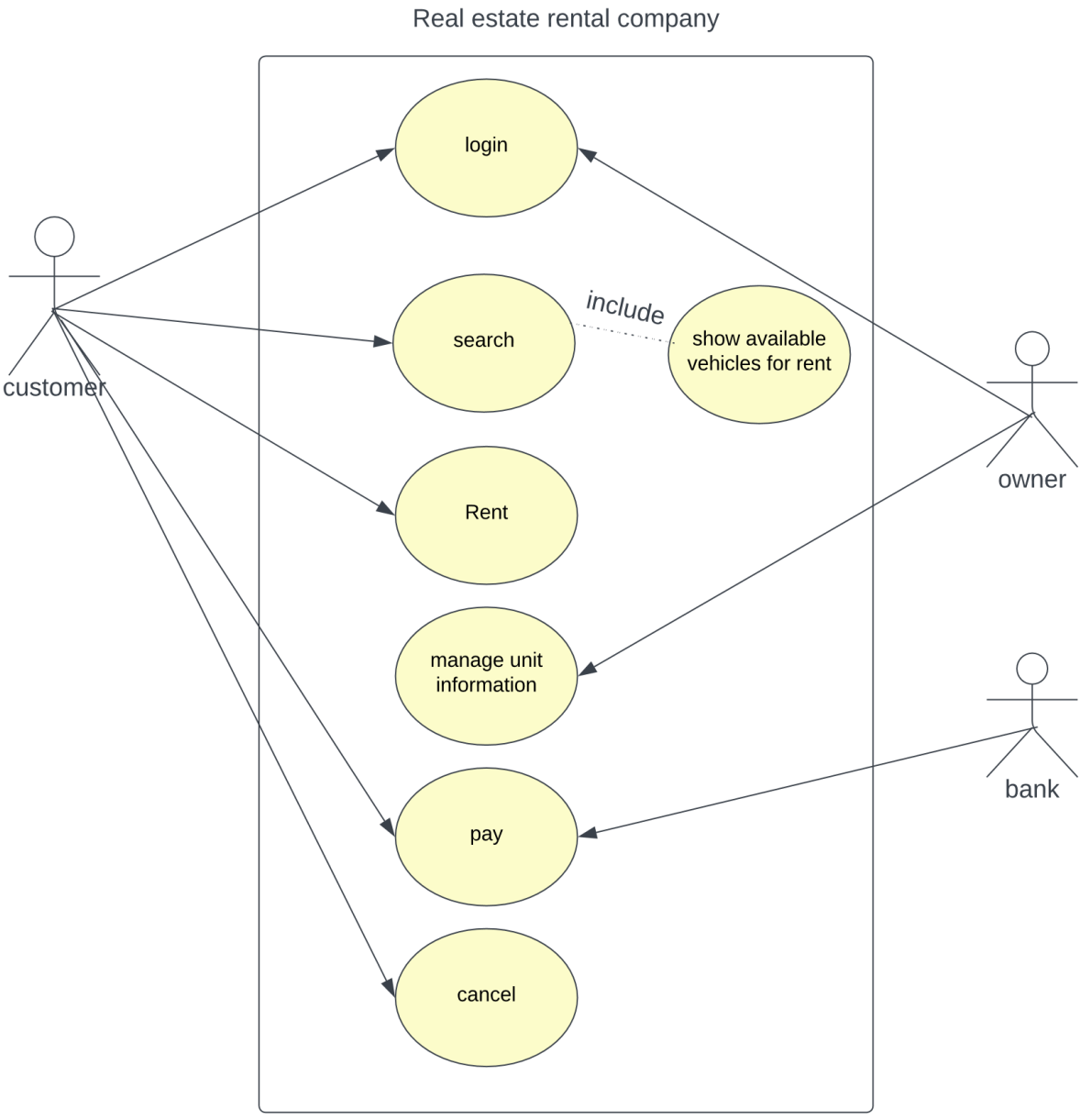

6.0
pay
validation data
bank
card details
8.0
withdraws money
confirmation
card ditails
5.0
rent
duration of reservation
personal information
d3
customer
confirmation
confirmation
7.0
cancel
entered code
Owner
id&password
access given
1.0
login
usernamr &password
logged in succesfully
Customer
unit data
available units for rent
report information
validation data
entered data
d1
login
4.0
show unit information
3.0
search
selected information
2.0
manage unit information
unit data update
unit delete
new data
d2
unit information
request
response
unit information
cofirmation process
update date
updated data

Use case diagram



Use Case ID:	1
Use Case Name:	LOGIN
Actors:	Owner, Customer
Preconditions:	**For Customer:** The customer opens the application and clicks on login, then enters the correct username and password, or true personal details if creating a new account. **For Owner:** Owner enters ID and password
Post conditions:	**For Customer:** Successfully Login or submitted details will be saved to the database and a new account will be created. **For Owner:** The owner accesses all his data in the system.
Normal Flow:	**For owner:** The owner enters the ID and password. verify that the entered ID and password are true. The owner accesses all his data. The owner edits or delete or adds to his data. **For customer:** **If the customer has an existing account:** The customer enters a username and password. Check if the username and password are correct. The customer is allowed to start searching for real estate. **If the customer creating a new account:** The customer fills out a form that needs their details. The customer should provide information that is compulsory in the form. A new account is created with the corresponding details. Then the customer is taken to choose real estate.
Alternative Flows:	**For owner:** If the owner enters a wrong ID or password. An error message is displayed. The owner re-enters the ID and password. **If the customer has an existing account:** customer enters username and password. If login fails, an error message is displayed “invalid username or password”. Customer can retry again.

	If the customer creating a new account: If any compulsory information is not filled in, a pop message will appear on the screen. The customer should fill out the missing information. And now an account is created with the provided details and takes you to the next page.
Exceptions:	**For existing accounts:** If the customer forgets his password, the customer enters his phone no. or email to get a code. Then changes his password. After verification, customers are allowed to start searching. **For new account:** If any of the personal details are wrong a warning message appears on the screen to input the right details again.

Use Case ID:	2
Use Case Name:	Search for real estate
Actors:	Customer
Preconditions:	customer must login to the application, and start enter the data for what he wants (house, workspace, room, office, …)
Post conditions:	Customer search about needed real estate and selected one from all the data that has been shown to customer
Normal Flow:	1. After the customer has logged in 2. The customer start entering the needed data: 2.1. Type of real estate needed. 2.2. The space of the property. 2.3. Number of rooms. 2.4. The range of the price. 3. Then click on the search button to start searching for the available real estate that matches the data that customer entered in the database. 4. All the available real state will display under the search. 5. The customer selected what is suitable for him.
Alternative Flows:	1. Customer entered the needed data. 2. If there is no available real estate that matches the entered data 3. Customer should re-enter another data for the real estate he wants
Exceptions:	if the customer needs do not exist in the application, then customer can communicate with the company to add new features to the system.

Use Case ID:	3
Use Case Name:	View available property
Actors:	Customer
Preconditions:	The search should be available in the database and there is available real estate in it
Post conditions:	The customer selects the data for needed real estate. the system notified him that "there are available options in another real estate".
Normal Flow:	Customer logins to the system If the login is successful, details of the real estate will appear. The customer selects what type of real estate he wants and enters the information about it. When it is exists, all the available real estate will display.
Alternative Flows:	In step 1 of the normal flow, if the login fails The system will prompt the customer to enter a valid username and password. The passenger enters valid information. Use Case resumes in step 2. In step 3 of the normal flow if there are no available property matches the entered data in the database. The system will prompt customers to say that " there are no available properties similar to the entered data you can retry another selection." the customer selects another property or price or space. Use Case resumes in step 3.
Exceptions:	

Use Case ID:	4
Use Case Name:	Rent a real estate
Actors:	Customer
Preconditions:	1. Ensured that it is suitable real estate. 2. Select duration of reservation
Post conditions:	1. The real estate status is updated in the system and database. 2. The customer pays the money
Normal Flow:	1. The customer selects one option after searching. 2. The unit information will appear. 3. The customer will select the duration of reservation. 4. Select rent. 5. Enter personal information
Alternative Flows:	
Exceptions:	1. If duration is not suitable, he will select another option

Use Case ID:	5
Use Case Name:	Manage unit information
Actors:	owner
Preconditions:	The owner wants to modify (add, delete, update) his properties
Post conditions:	Data updated. The owner lets user see more available real estate.
Normal flow:	**after owner login:** **1.** The owner can add new real estate by entering its data. **2.** The owner can delete data from his database. **3.** The owner can change and update data for real estate after selecting it. **4.** print message for owner “successful process”.
Alternative flow	**When adding new real estate:** If the entered data is already existed, the owner re-enter new data.
Exceptions:	If the owner entered incomplete data when adding new real estate, “unsuccessful adding” message appear.

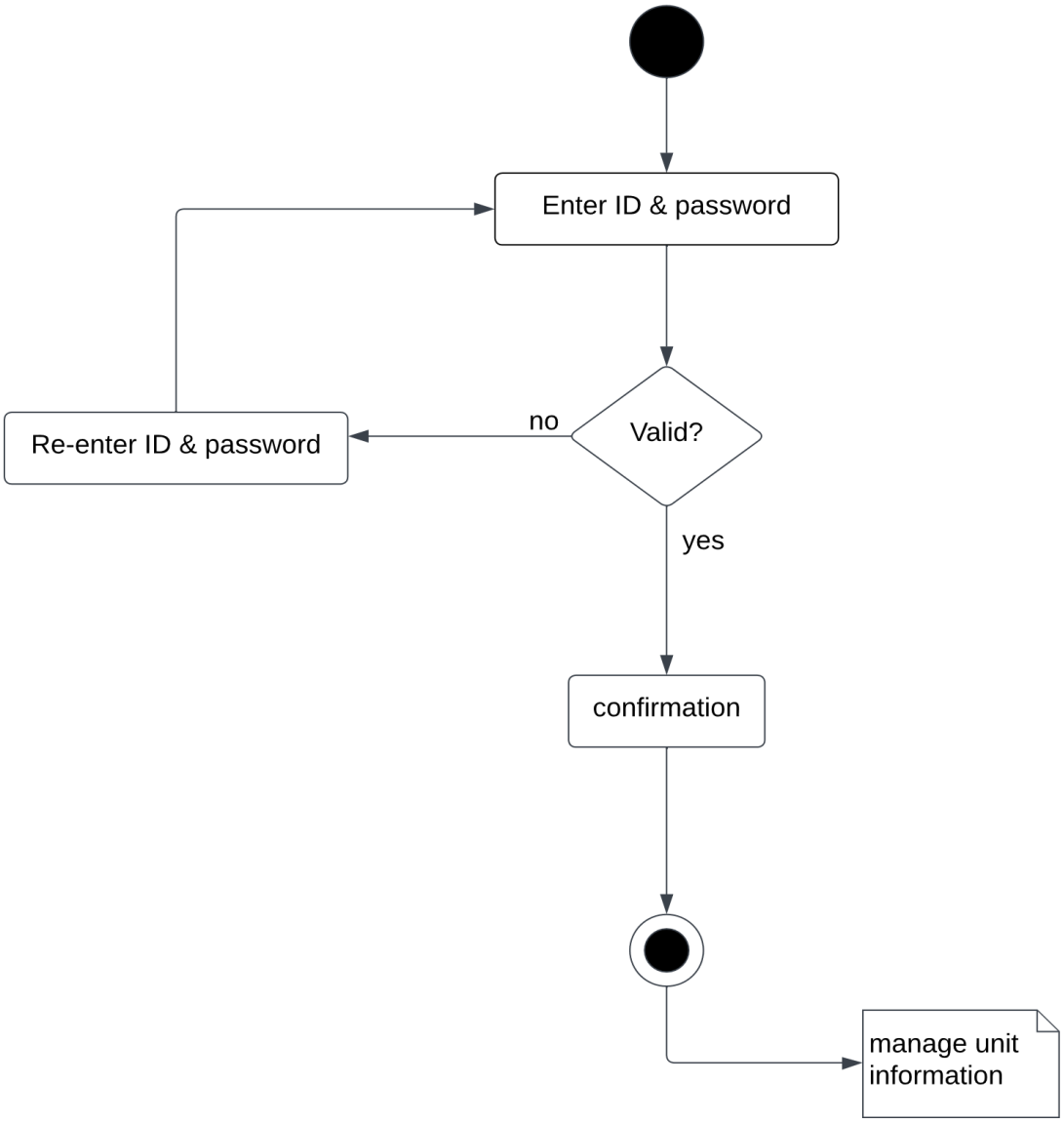
Use Case ID:	6
Use Case Name:	Pay
Actors:	Customer, bank
Preconditions:	The customer has selected a real estate and is ready to make a payment. The customer has entered valid payment details.
Post conditions:	The payment is successfully processed. The real estate renting is confirmed
Normal Flow:	1. The customer selects the desired real estate and proceeds to the payment page. 2. The system presents the payment options to the passenger (credit card, debit card). 3. The customer selects their preferred payment method. 4. If the credit card or debit card is chosen: 4.1. The system prompts the customer to enter their card details. 4.2. The customer enters their card details. 4.3. The bank validates the entered card details. 4.4. The bank withdraws money from the card. 4.5. The bank sends a message to the passenger to complete the payment
Alternative Flows:	1: Payment Gateway Unavailable If there are technical issues with connecting to or communicating with the payment gateway: A notification is displayed informing customer about the temporary unavailability of online payments. 2: Invalid Card Details If entering credit/debit card details fail validation checks: An error message is displayed indicating that invalid card information was provided. Customers are prompted to re-enter the correct card details. 3: Insufficient Funds If authorization fails due to insufficient funds in customers' accounts: An error message is displayed indicating that there are insufficient funds available for this transaction. customers are advised to use another form of payment or contact their financial institution.
Exceptions:	1. passenger enters incorrect credit card details 2. system displays an error message indicating that the payment was unsuccessful. 3. The passenger is prompted to re-enter their credit card details or choose an alternative payment method.

Use Case ID:	7
Use Case Name:	Cancel rent reservation
Actors:	Customer
Preconditions:	The customer must be logged into the system. The customer must have a valid lease that can be canceled. The system must be operational.
Postconditions:	The real estate is marked as "Available" in the system. If applicable, the refund is processed.
Normal Flow:	Customers initiate cancelation. The system prompts the customer to provide the necessary real estate information. The system validates the provided real estate information: If the lease is valid and eligible for cancellation, proceed to step 4. If the customer wants to cancel rent reservation before a week ended after the date of reservation, then the system calculates the refund amount based on the company's refund policy. The system prompts the customer to confirm the cancellation. If the customer confirms, proceed to step 6. If the customer cancels the cancellation process, return to step 1. The system updates the status of the real estate to "Available" in the database.
Alternative Flows:	Invalid real estate Information: • If the provided property information is invalid, an error message is displayed, and the customer is prompted to re-enter the information. Customer Cancels Cancellation: • If the customer decides not to proceed with the cancellation, they can cancel the cancellation process, and the system returns to step 1.
Exceptions:	**Invalid Reservation** If the customer's reservation cannot be found or is not valid, the system displays an error message. The system prompts the passenger to contact customer support for further assistance. **Late Cancellation** If a customer wants to cancel a reservation after a week from the date of reservation, then the system informs the customer that a cancellation may not be possible. The system may apply cancellation fees as per the company's policy.

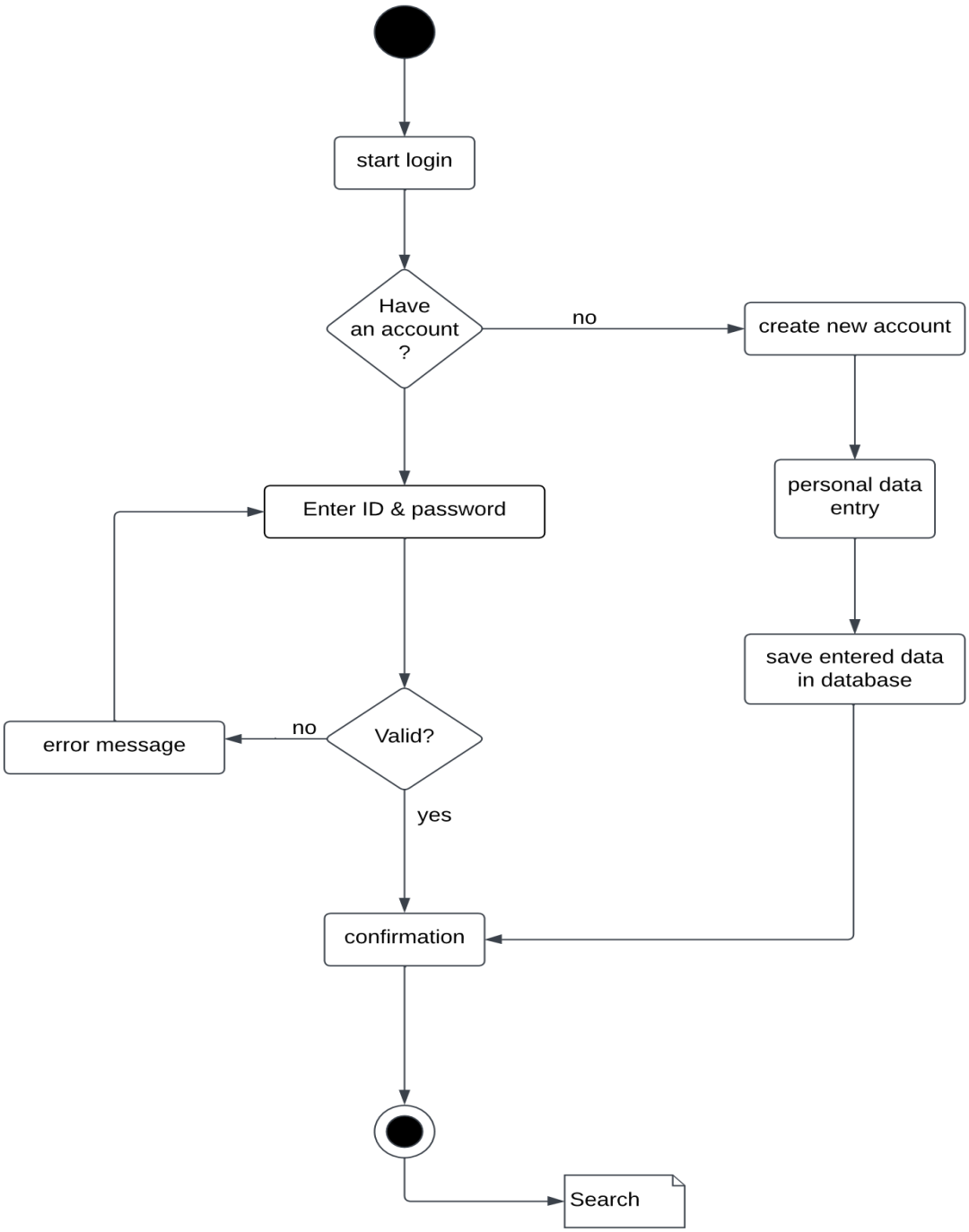
	Payment Refund Issues If there are issues with refunding the customer's payment method, the system logs the issue and informs the customer. The system guides the customer on resolving payment-related issues.

Activity diagram

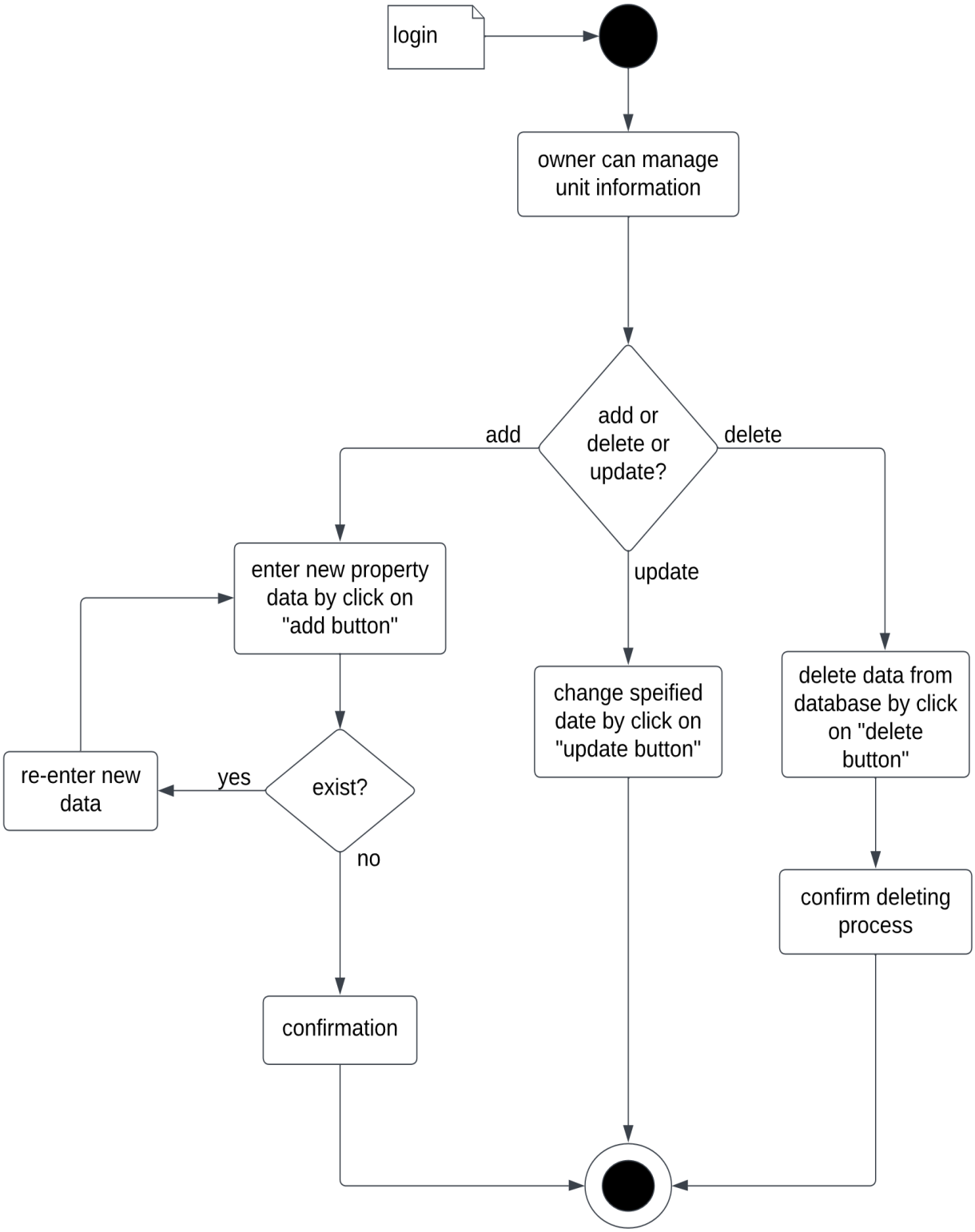
1. Login for “owner”



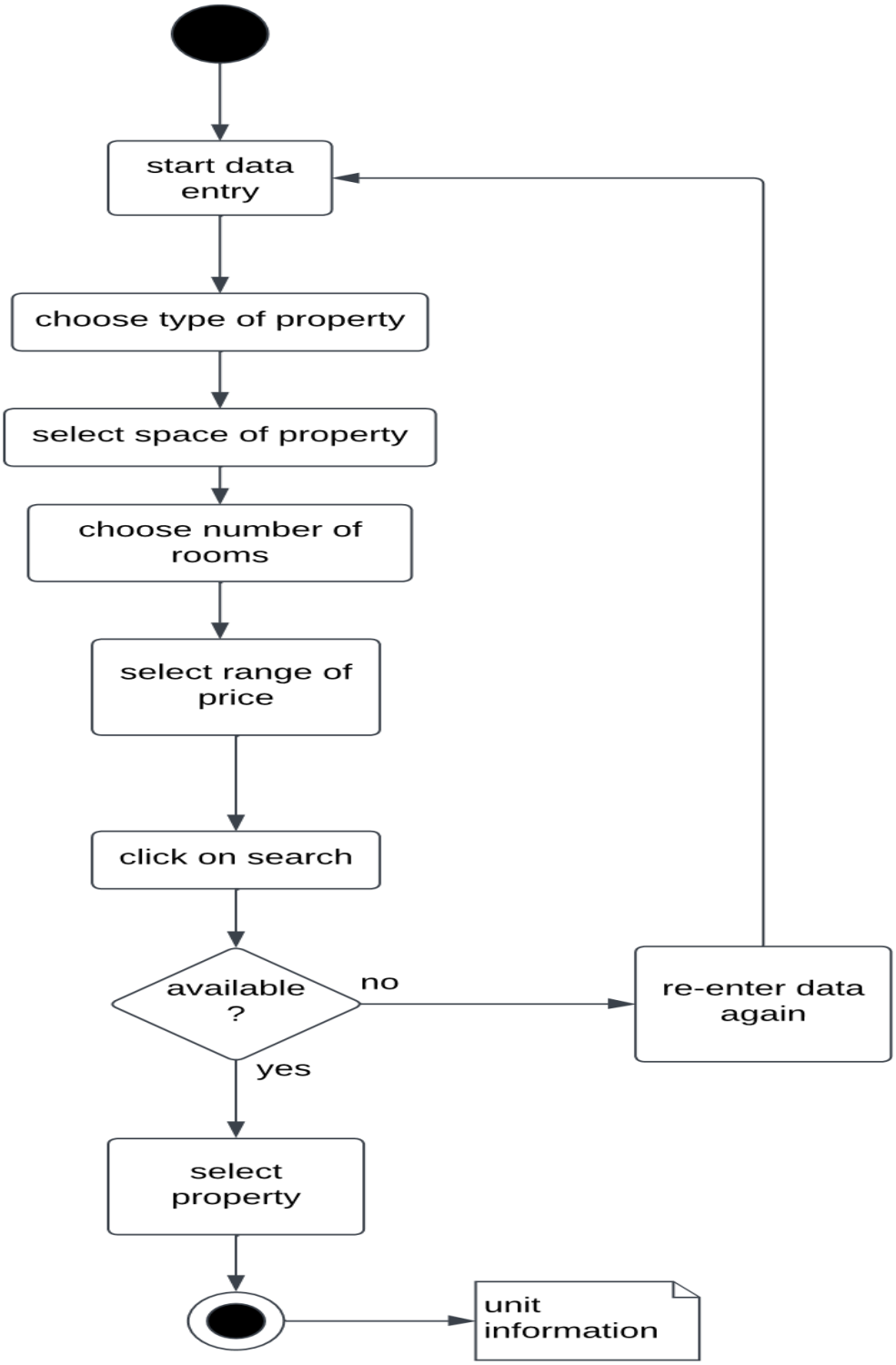
Login for “customer”



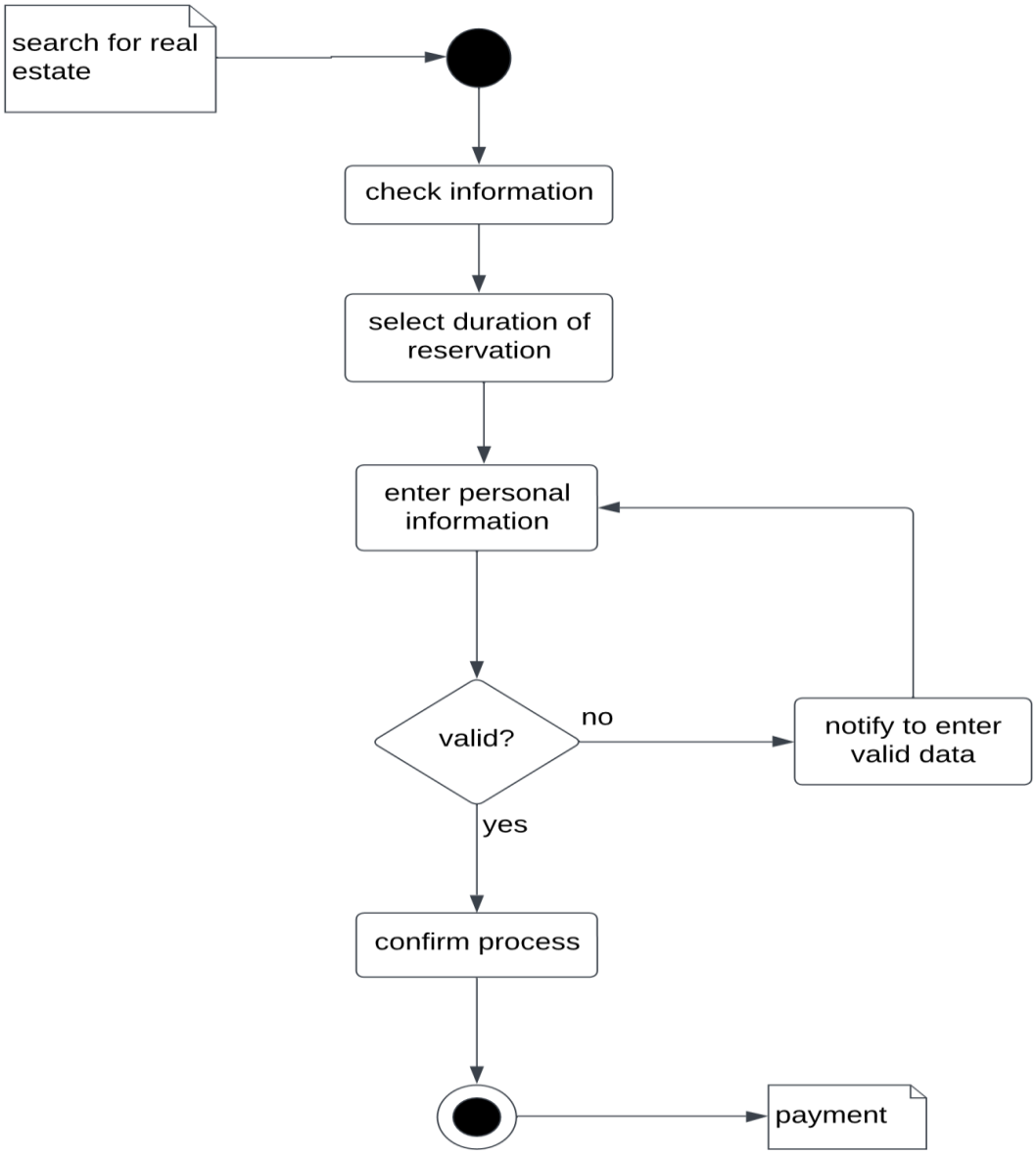
2. Manage unit information



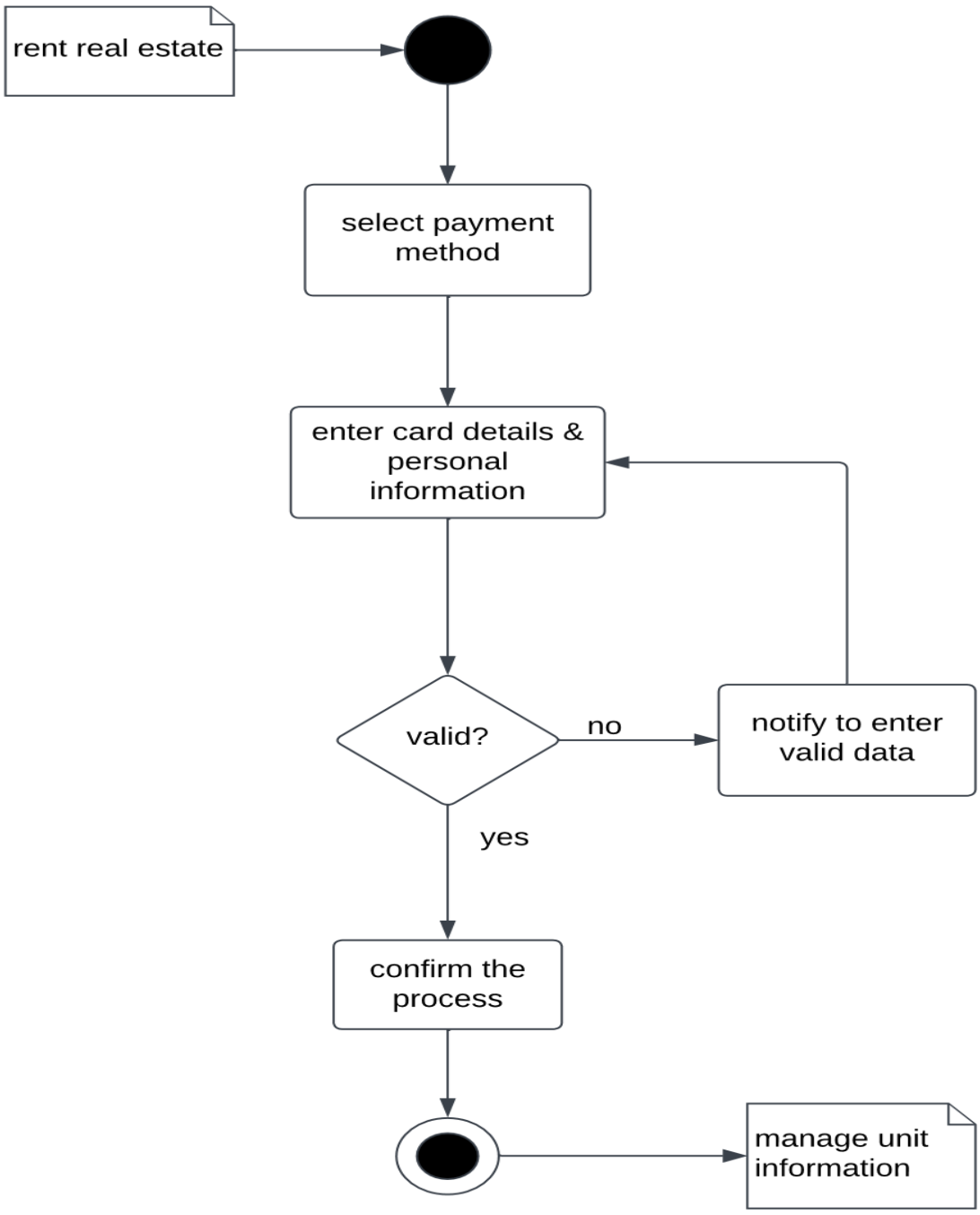
3. Search for real estate



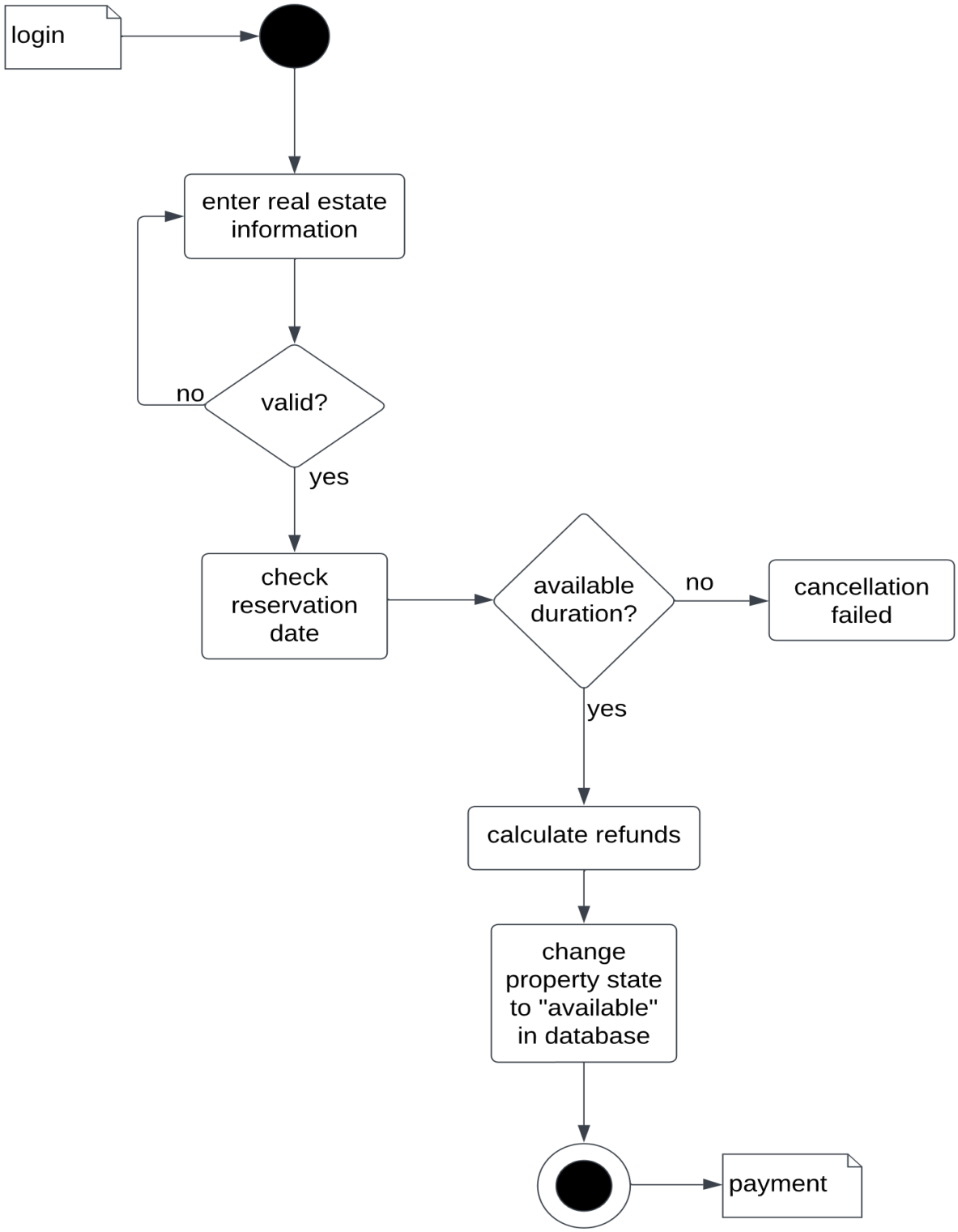
4. Rent


search for real estate
check information
select duration of reservation
enter personal information
valid?
no
notify to enter valid data
yes
confirm process
payment

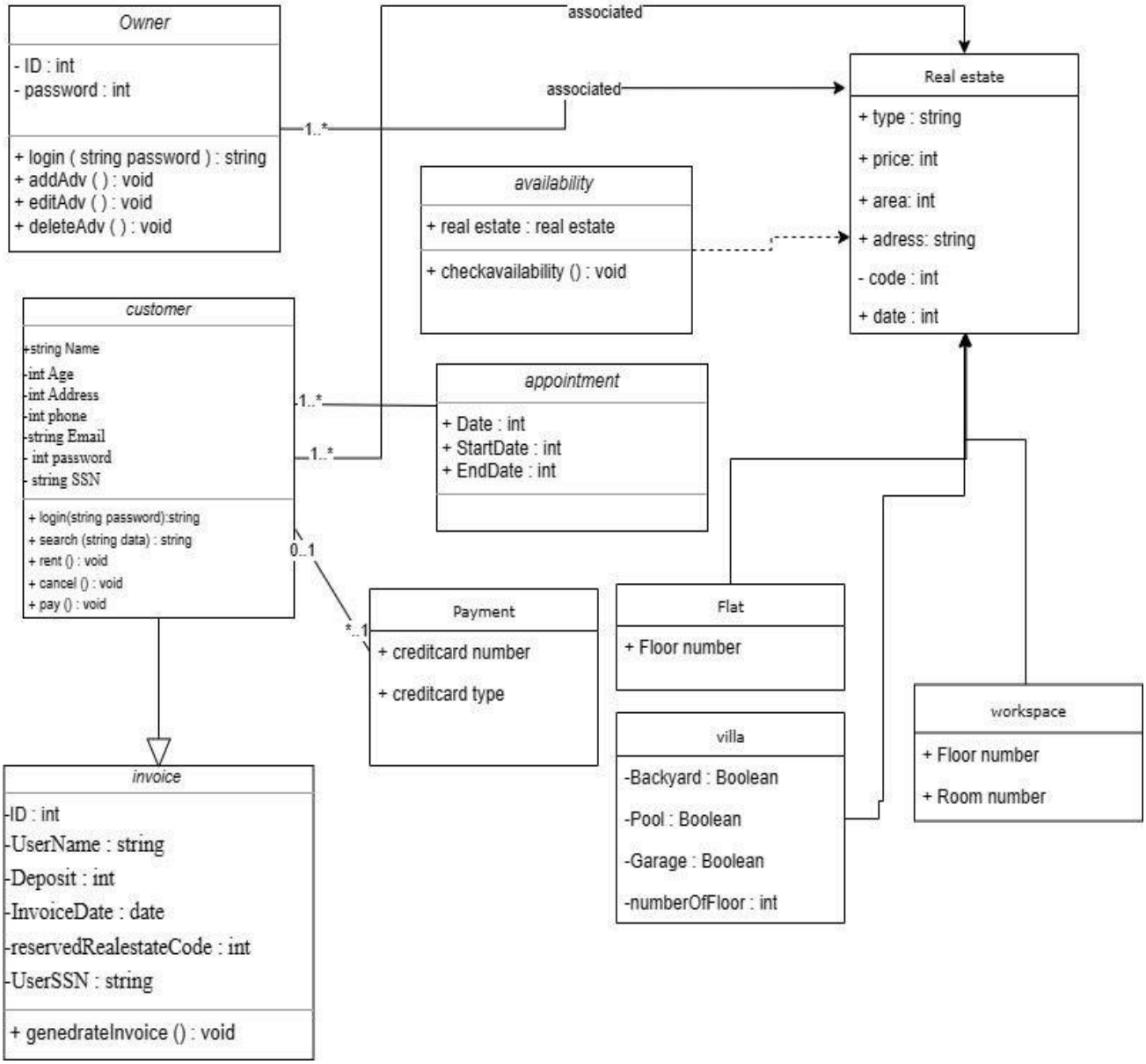
5. Pay


rent real estate
select payment method
enter card details & personal information
valid?
no
notify to enter valid data
yes
confirm the process
manage unit information

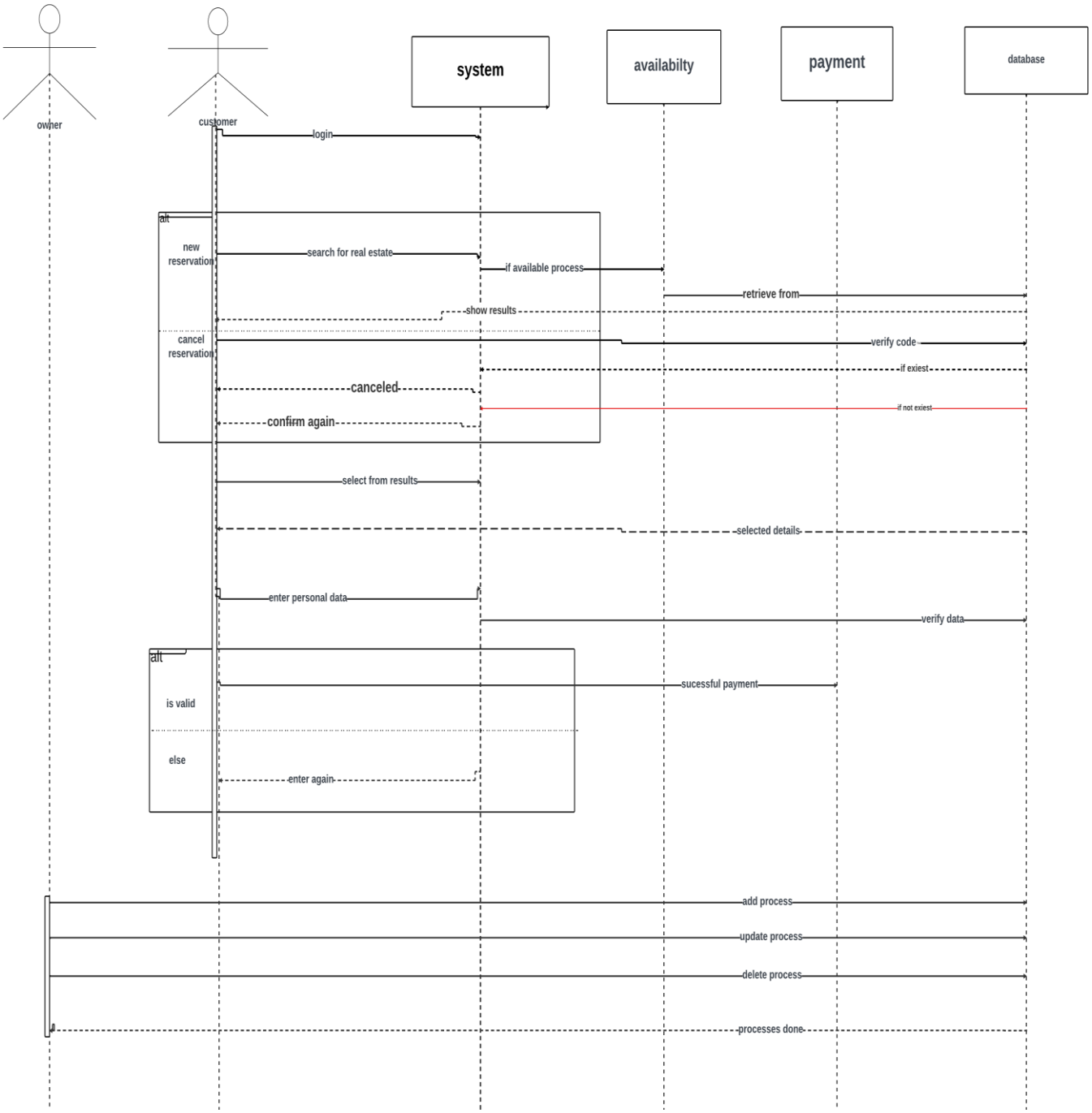
6. Cancel rent reservation



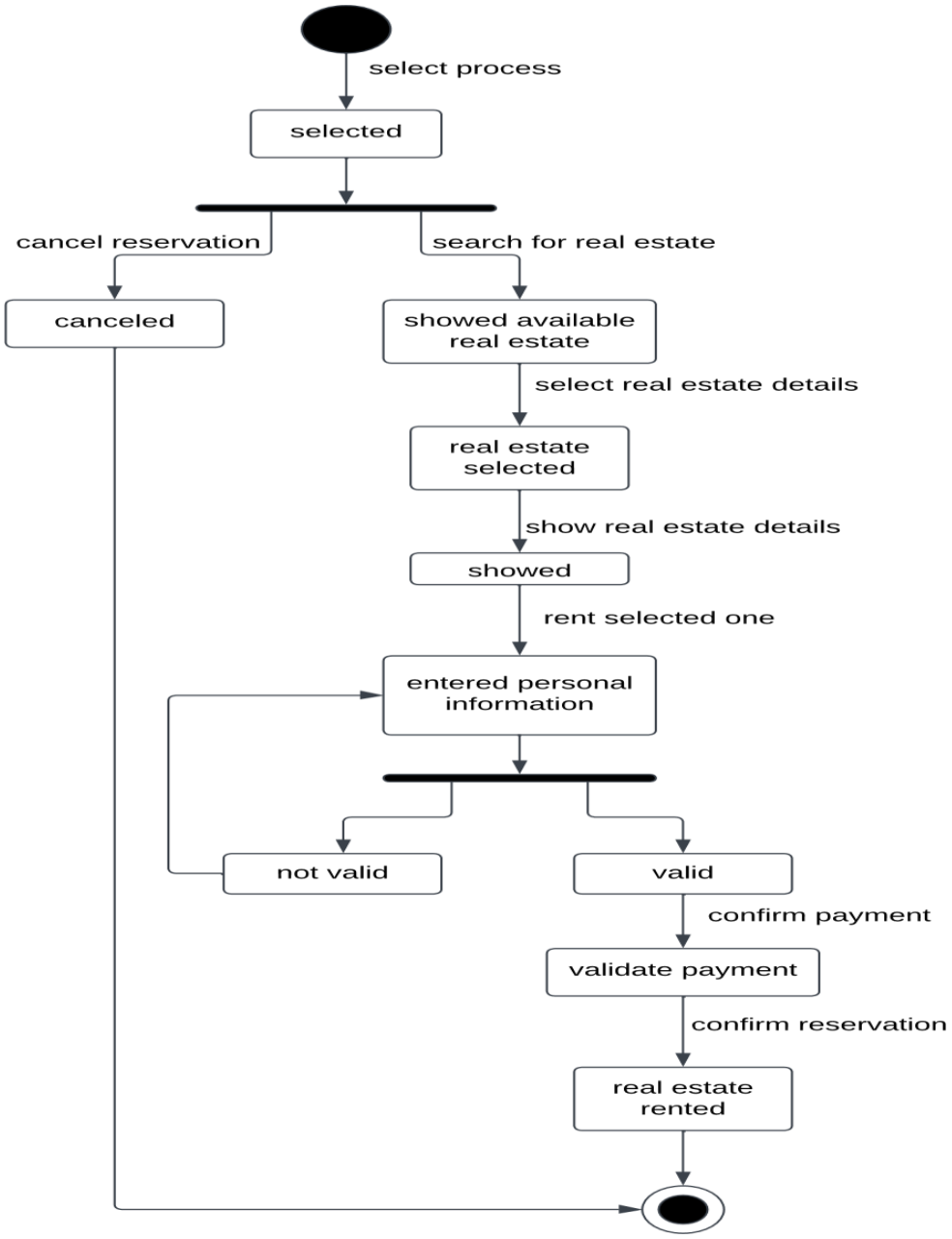
Class diagram



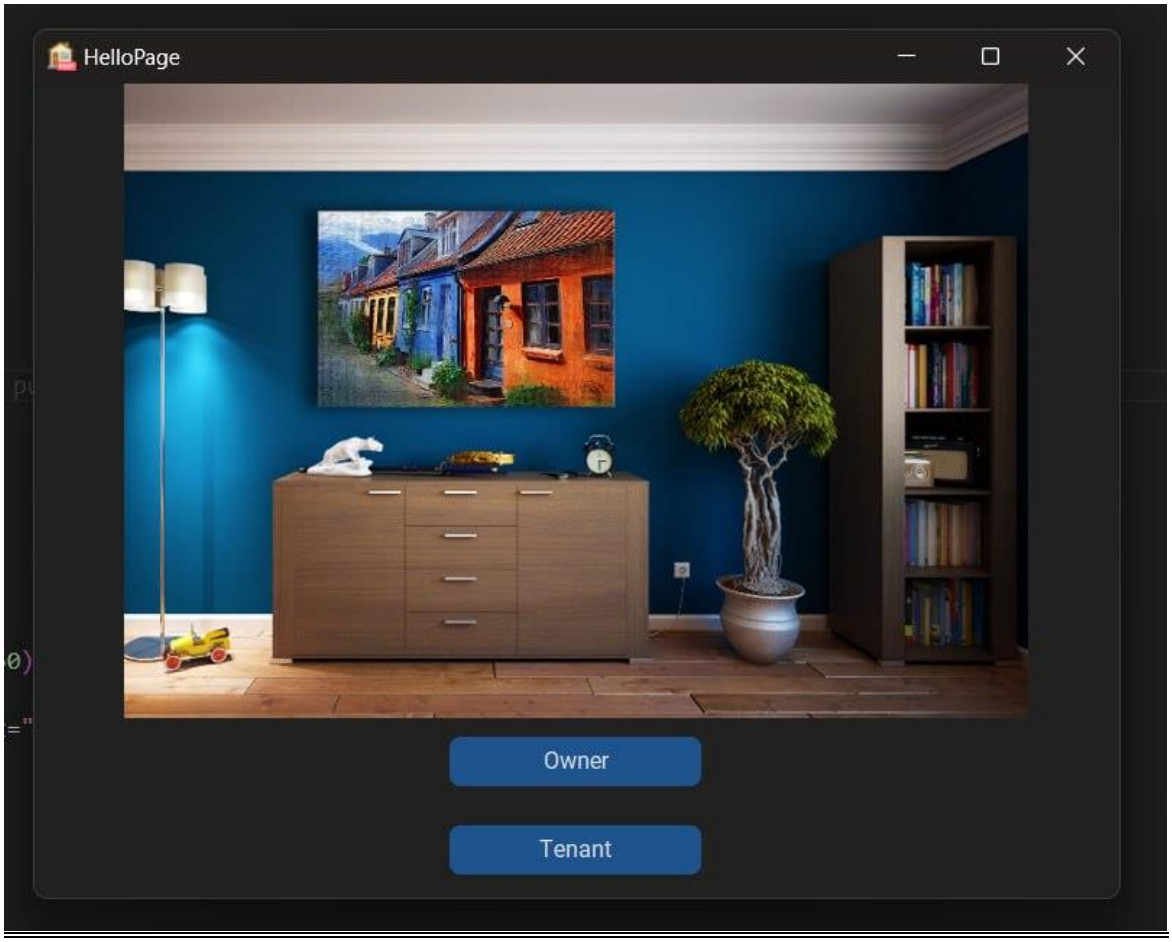
Sequence diagram



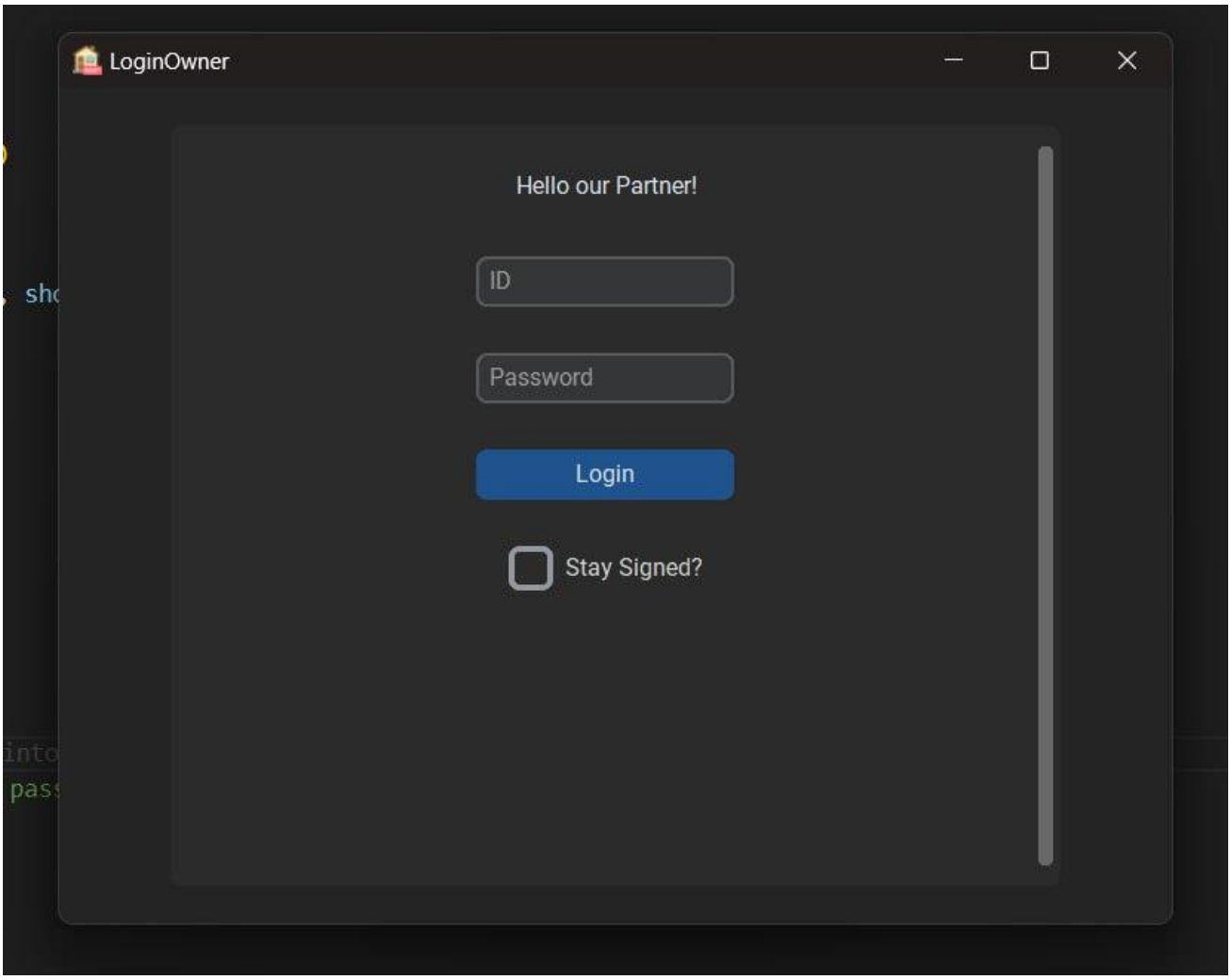
State diagram



Chapter 3: GUI



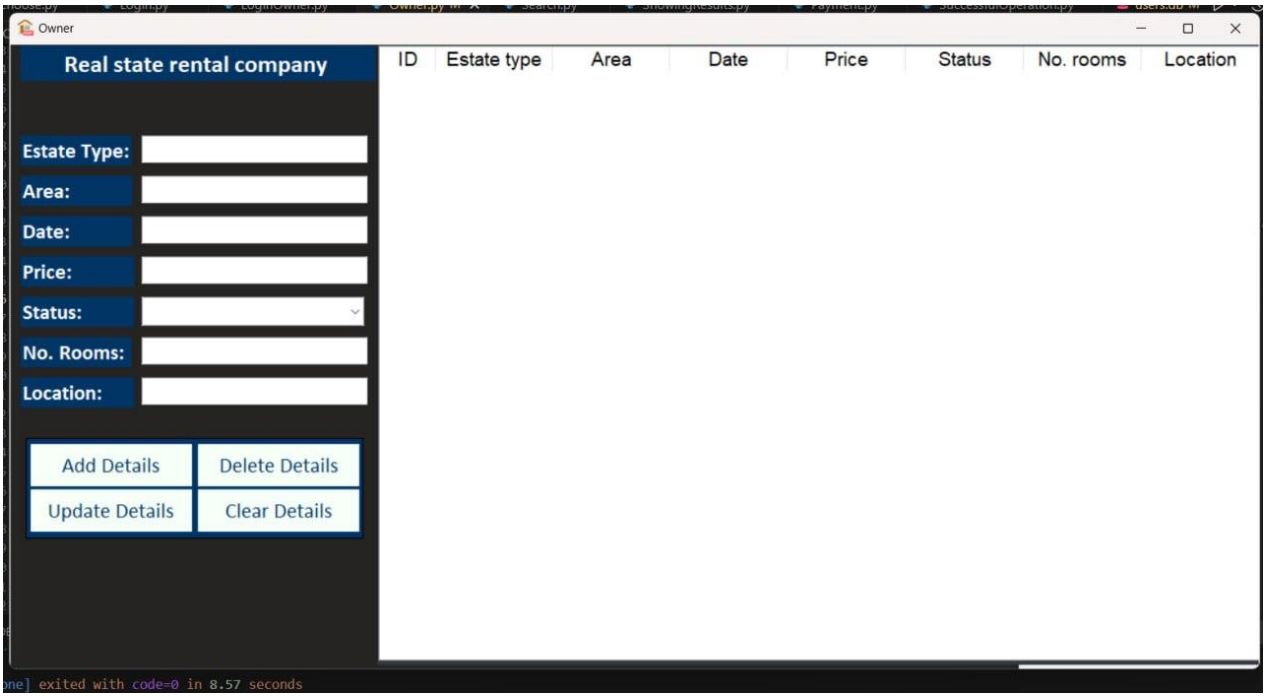
First, our application starts by choosing who will deal with this software application by selecting between two choices which are owner or tenant.



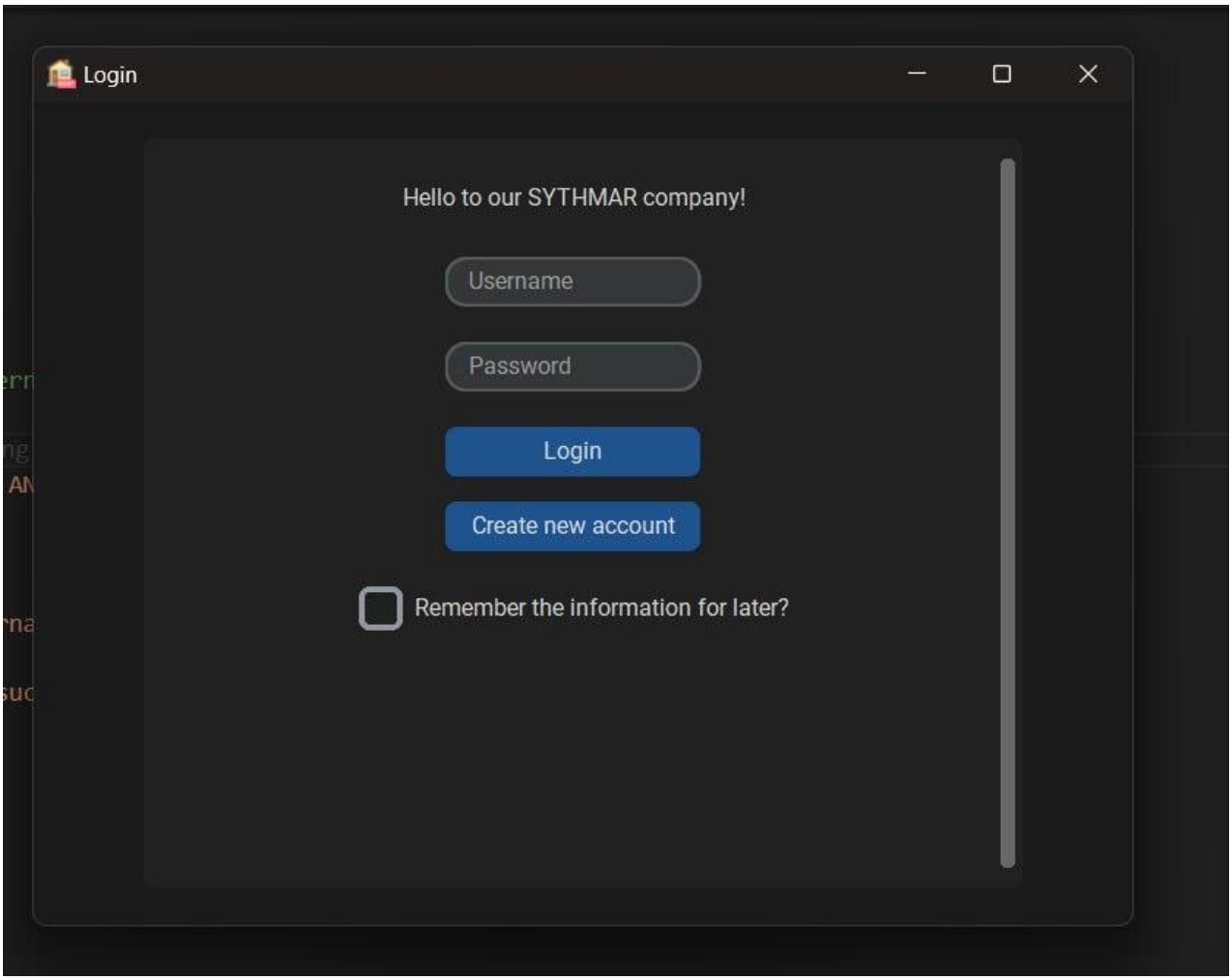
For owner:

The owner starts login by entering his ID and password which is saved in the database.

If the entered data is not valid an error message appears, and the owner should re-enter his valid data again.

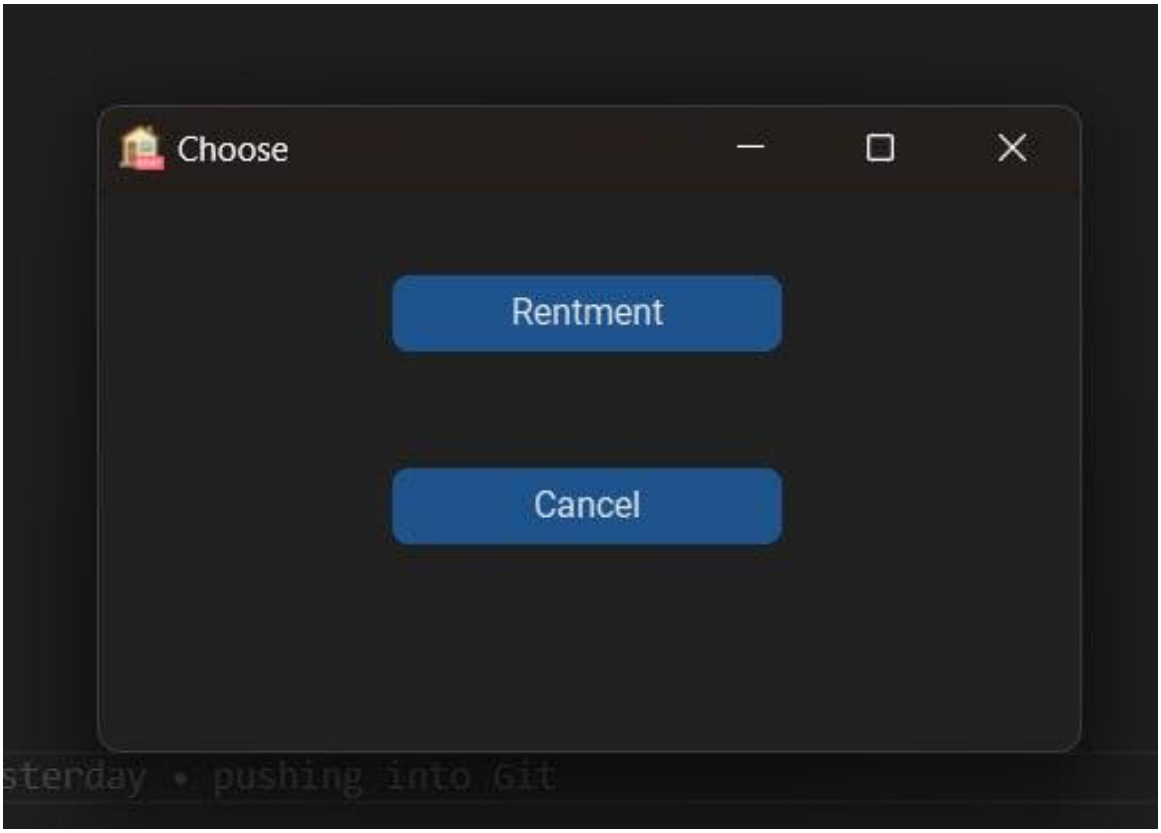


After login, the owner can access his real estate data by add, update, delete from database.
All data will appear in the database table.

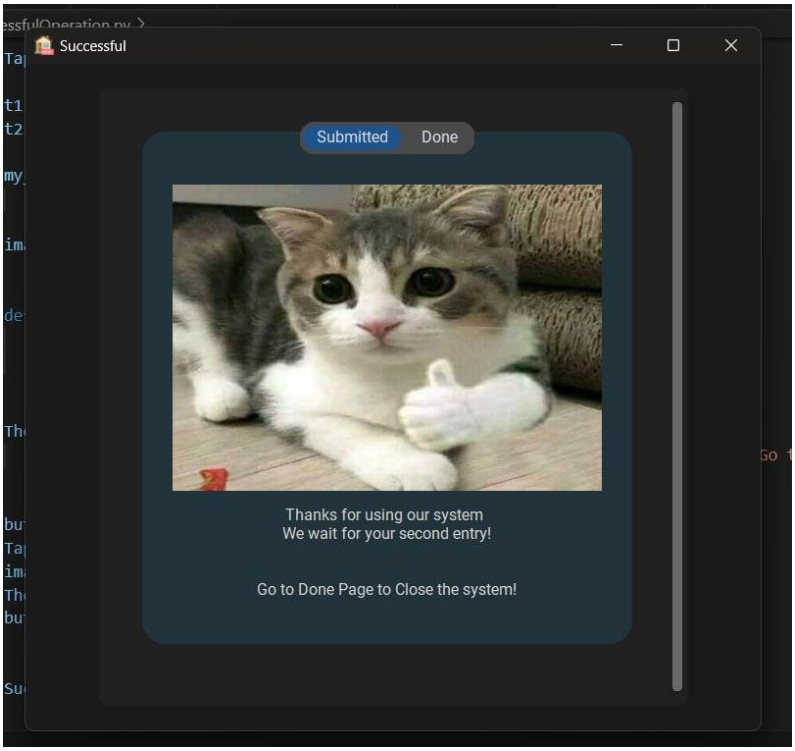


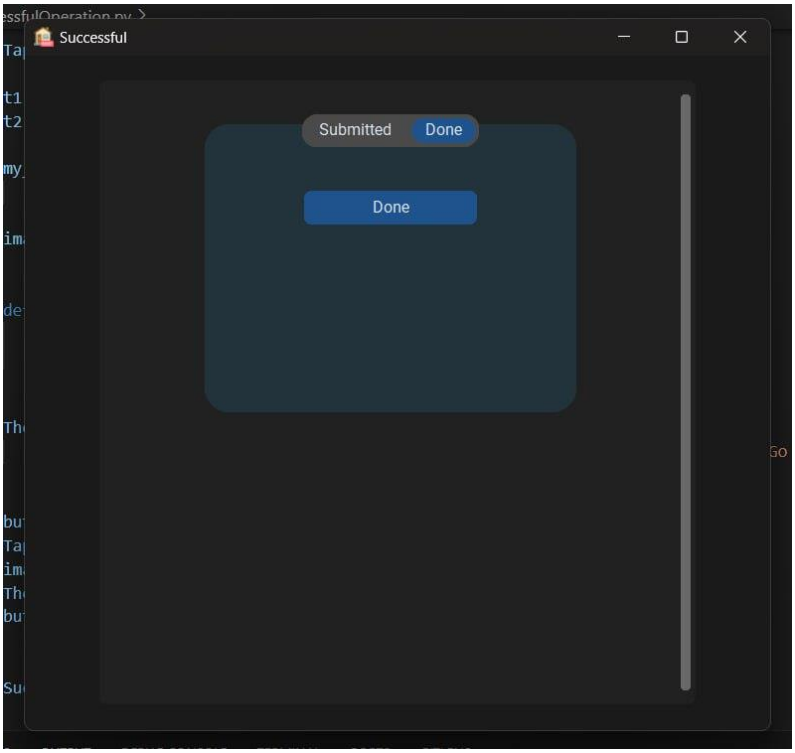
For customer:

The customer starts login by entering his personal information into the system if he has an existing account and if not, he can create a new account.



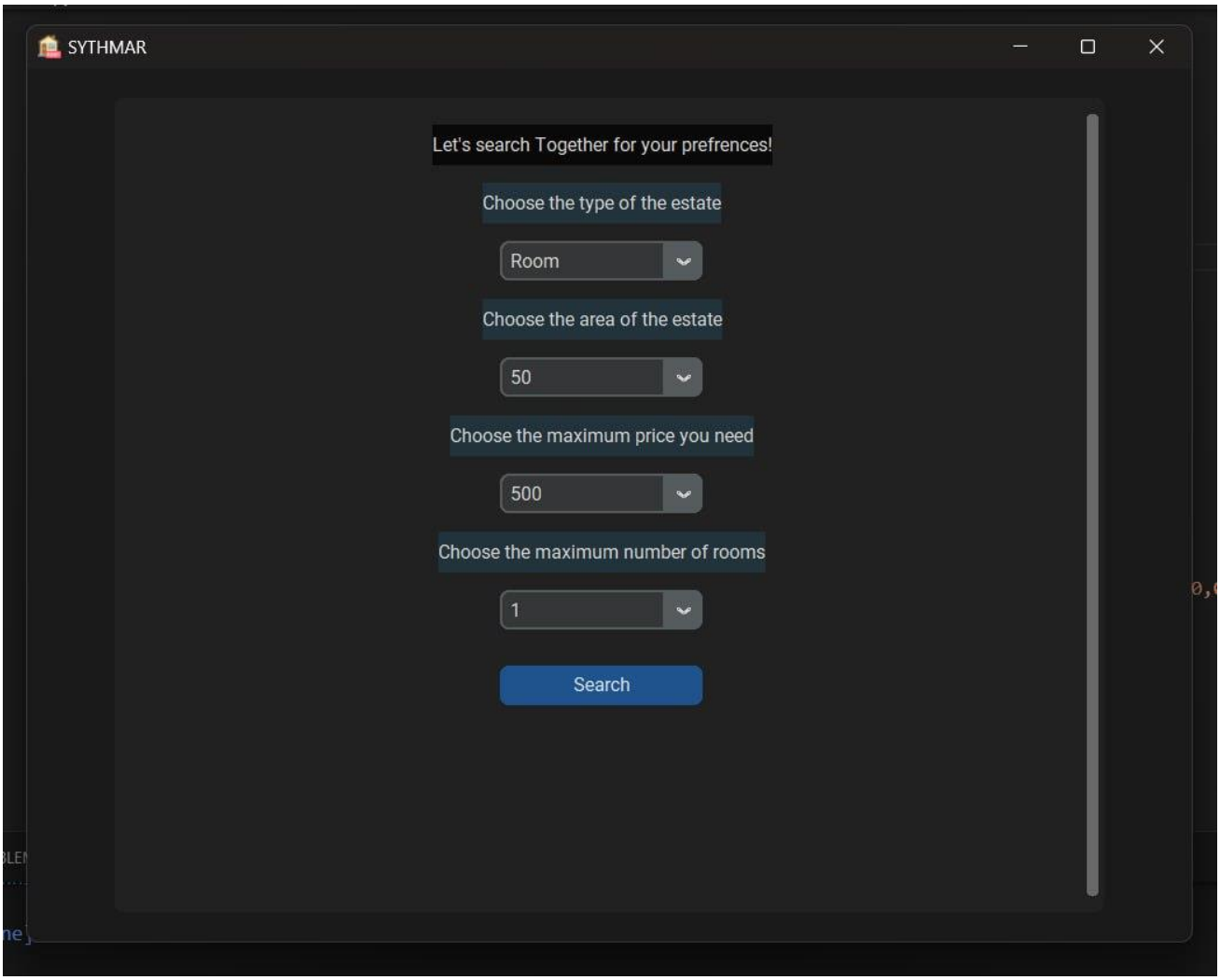
Through this page the customer can choose his process if it is rent or cancelation process.





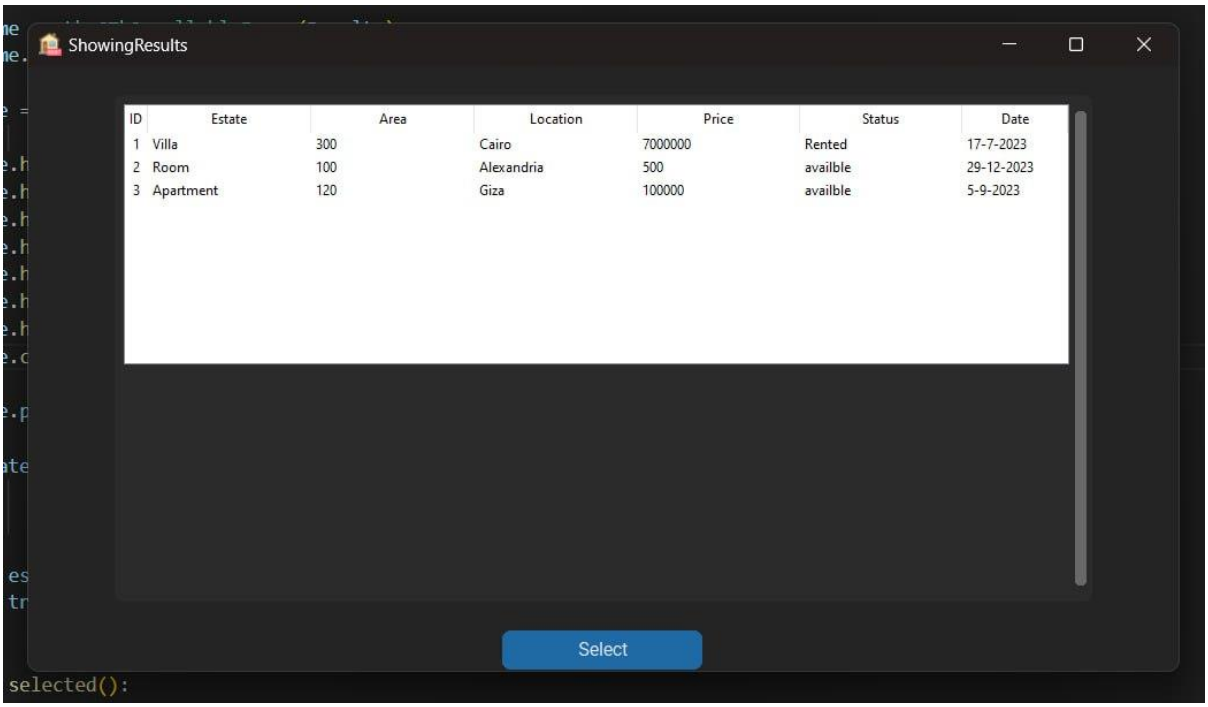
Cancel:

The process is done successfully, and a confirmation message appears.

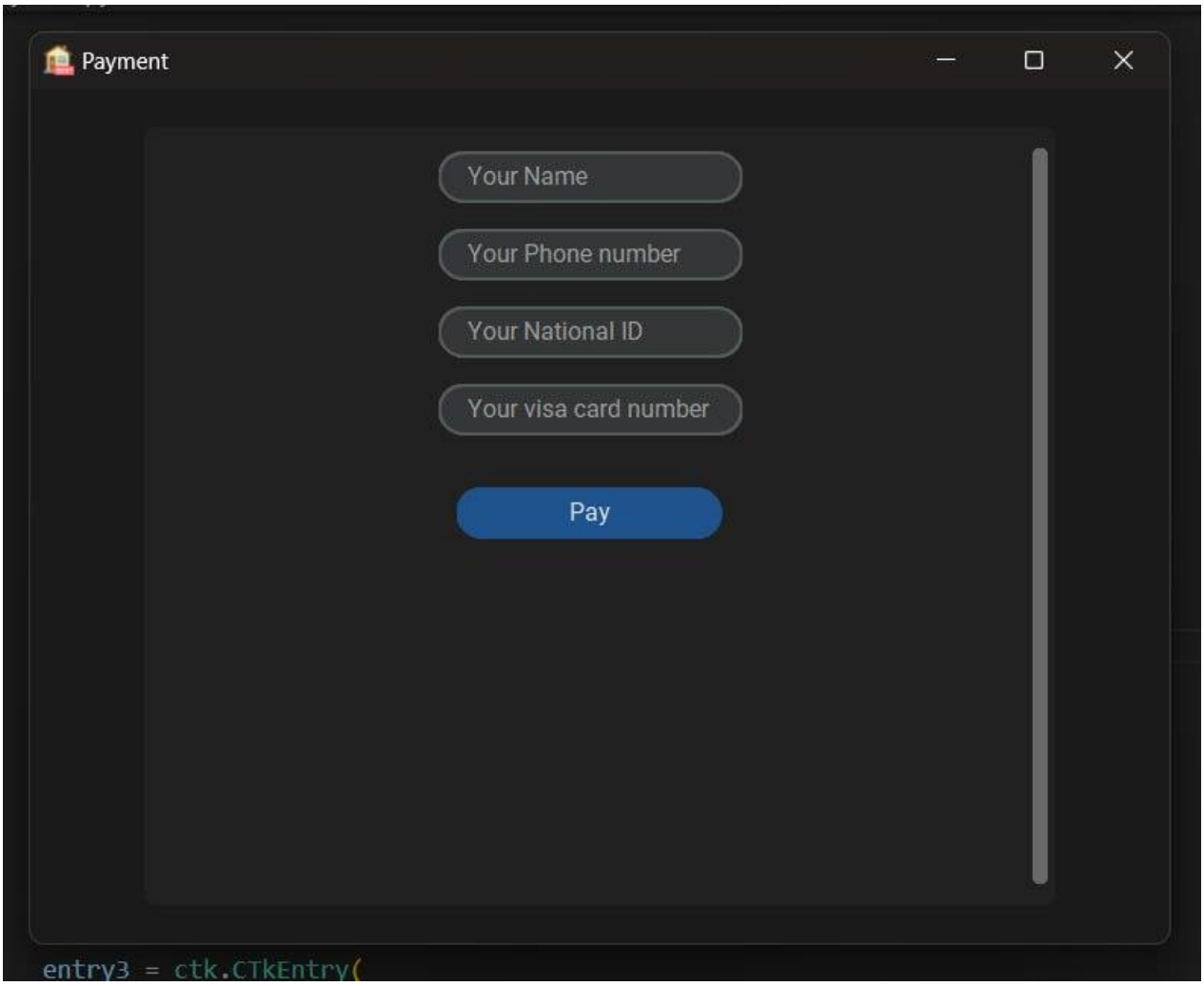


Rent:

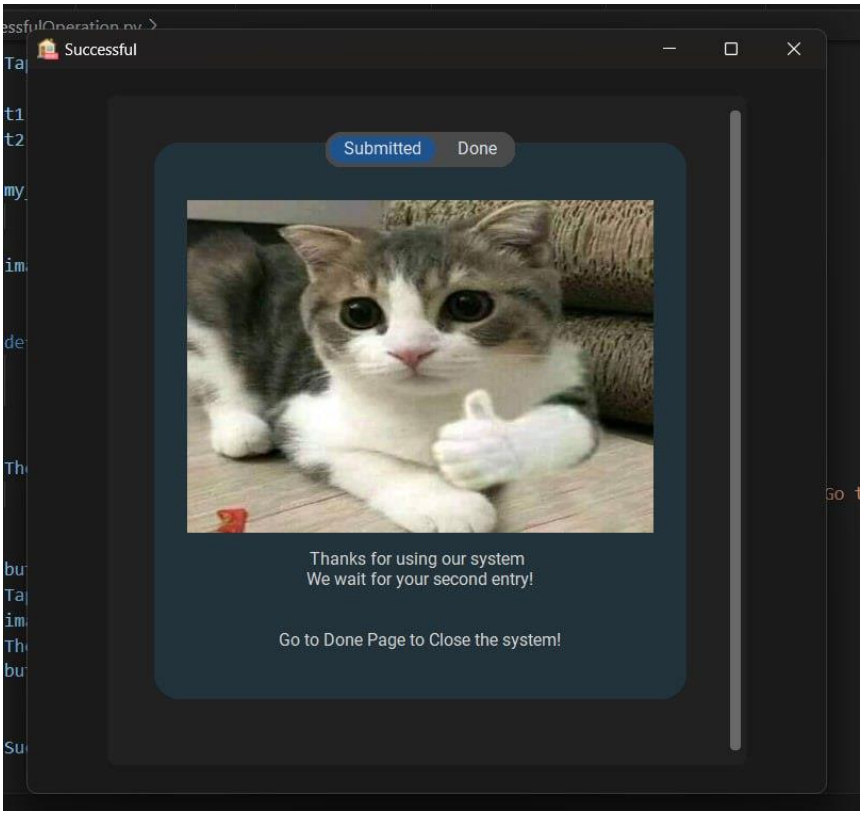
The customer enters the data about the needed real estate that he searches for (type of the real estate, area of the real estate, price of the real estate, number of rooms)

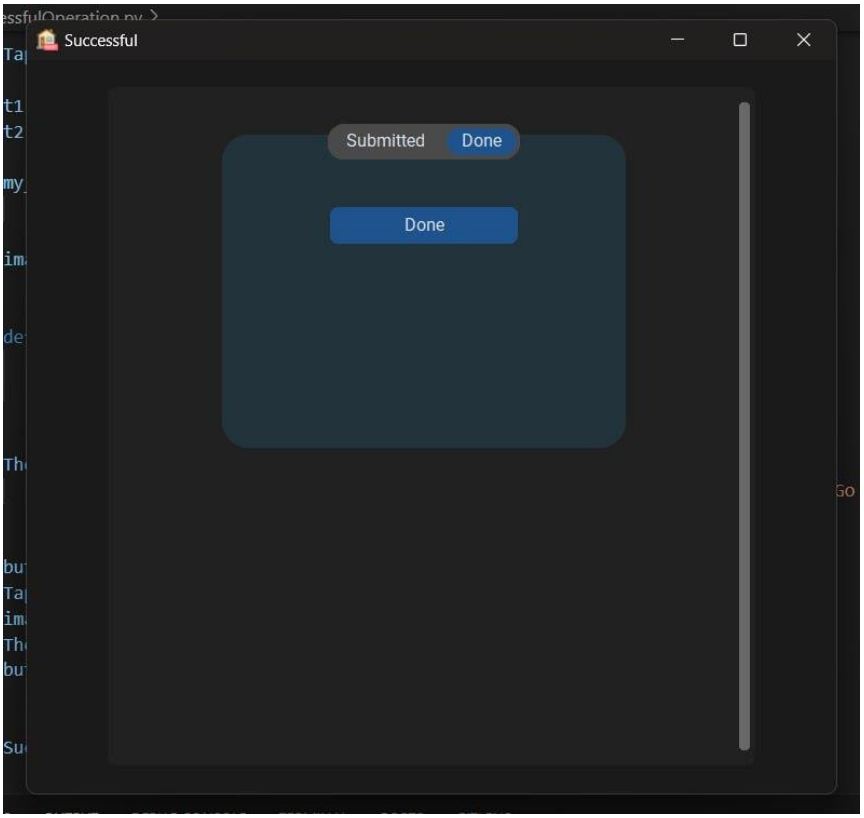


After searching, the available real estate that matches the customer search appears to the customer, then he selects what he wants.



Customer enters his personal data and credit card data to verify the payment.





The process is done successfully, and a confirmation message appears.