Group Project of group 8

Part B

Project – Car Rental Mobile Application

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Software Requirements Engineering (SEC. 006)

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Deliverable #1 (in charge of Adilet Masalbekov)

Use Case Name	List of related Requirements ID	Actor(s)	Brief Description
Subsystem: User Management			
Create Profile	FR02	Customer, Registration System	The actor will navigate to the registration page and fill out a form with personal details such as name, email, and password. After submitting the form, the system will validate the information, create a new user profile, and store this information securely for future reference.
Subsystem: Car Rental			
View Car Information	FR03	Customer, Inventory Database	The customer will navigate to the car listings page. The system will display a list of available cars with detailed information for each car, including specifications, pricing, availability, images, and any additional features.
Search and Filter Cars	FR04	Customer, Search Engine	The customer will use the search bar and filter options on the car listings page to find cars based on specific criteria such as location, dates, car type, and price range. The system will display the cars that match these criteria.

Reserve and Pay for Car	FR05	Customer, System Administrator, Payment Gateway, Inventory Database	The customer will select a car and rental dates, then navigate to the payment page. The customer will enter payment details, and the system will process the payment through a secure gateway. After successful payment, the system will confirm the reservation and send a confirmation receipt to the customer.
Select Pickup and Return Location	FR08	Customer, Location Database	During the reservation process, the customer will select the pickup and return locations for the rented car from a list of available options. The system will confirm these locations and include them in the reservation details.
Select Insurance	FR09	Customer, Insurance Company, Insurance Database	During the reservation process, the customer will be presented with various insurance options for the rented car. The customer can select an option based on their needs, and the system will include the insurance coverage in the reservation details and price.
Subsystem: Reviews and Alerts			
Leave Review	FR06	Customer, Review System	After the rental period, the customer will have the option to leave a review and rating for the rented car and overall rental experience. The customer will fill out a review form, and the system will post this

			review on the car's information page for future customers to see.
Receive Alerts	FR07	Customer, Notification System	The system will send alerts to the customer about important updates, such as reservation confirmations, payment reminders, or changes to rental details. These alerts can be sent via email, SMS, or in-app notifications, depending on the customer's preferences.
Subsystem: Information and Help			
Access FAQ	FR10	Customer, Administrator, FAQ System	The customer can navigate to the FAQ section to find answers to common inquiries. The system will display a list of frequently asked questions and their answers, covering topics related to the rental process, policies, terms, and conditions.
Abstract Use cases			
Log-in to the system	FR01	-	The actor will navigate to the login page and enter their username and password. The system will verify the credentials against the stored user profiles. If the credentials are valid, the system will grant access to the user's account.

Deliverable #2 (in charge of Adilet Masalbekov)

Use case: Reserve and Pay for Car

Iteration: 1, last modification: June 26 by Adilet

Primary actor: Car renter

Goal in context: To reserve a car and complete payment for the rental

Preconditions: The renter must have a valid user profile and must have selected a car for rental.

Trigger: The renter decides to reserve a car and proceed to payment.

Scenario:

1. The renter selects a car from the car listings page.
2. The renter selects the desired rental dates.
3. The system displays the total cost based on the rental period and chosen car.
4. The renter navigates to the payment page.
5. The renter enters his or her payment details.
6. The system validates the payment details and processes the payment through a secure gateway.
7. Upon successful payment, the system confirms the reservation.
8. The system sends a confirmation receipt to the customer's registered email.

Exceptions:

1. Payment details are incorrect or not recognized — see use case Validate Payment Details.
2. The selected car is not available for the chosen dates — system displays appropriate error message; see use case Check Car Availability.
3. The renter's account has insufficient balance or credit limit — system displays appropriate error message.
4. The renter's session times out during the reservation process — system prompts the renter to log in again.
5. The system experiences a technical issue and cannot process the reservation— system displays an error message and asks the renter to try again later.

Priority: High priority, to be implemented in the first increment

When available: First increment

Frequency of use: Frequent

Channel to actor: Via PC-based browser/mobile app, and Internet connection

Secondary actors: System Administrator, Payment Gateway, Inventory Database

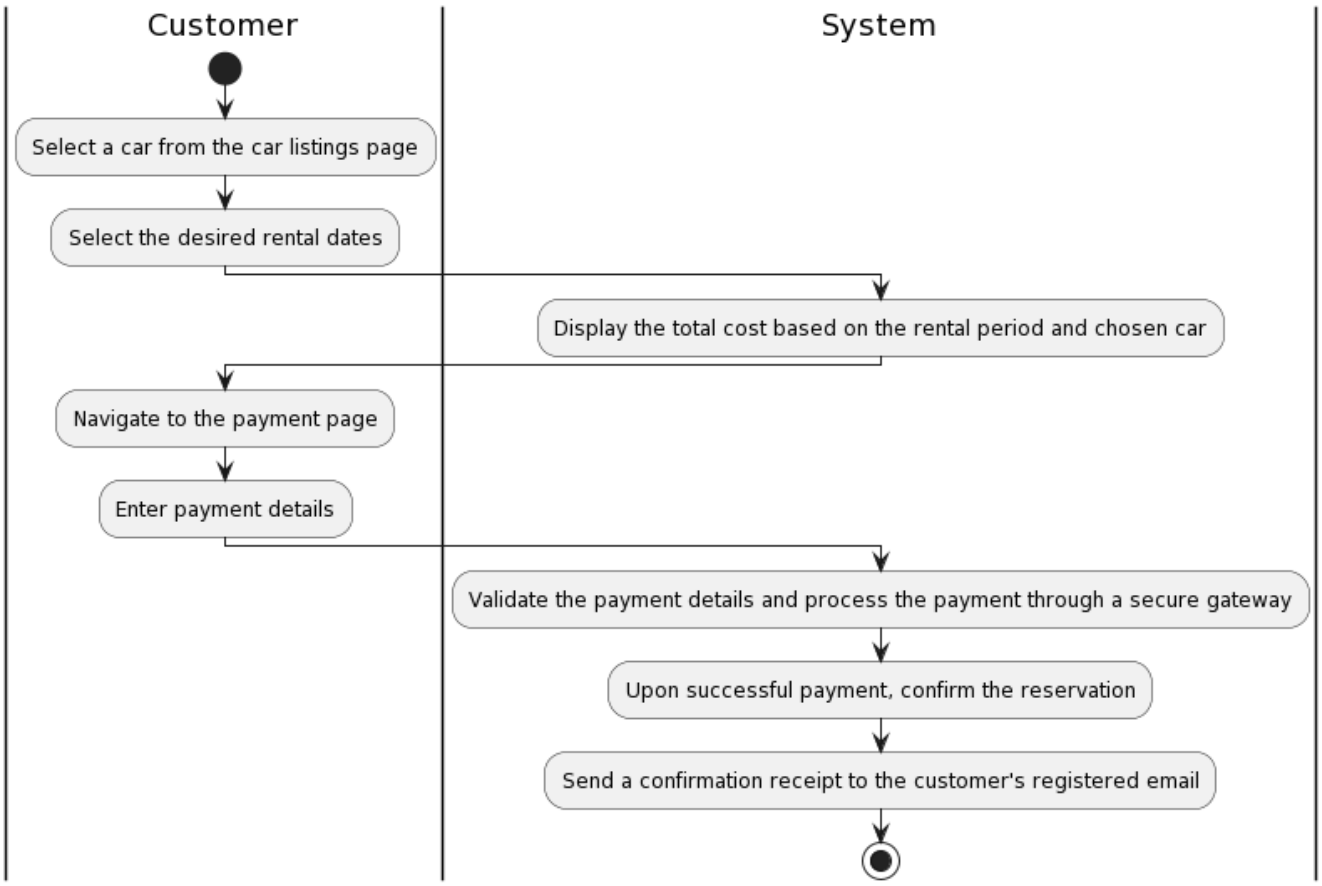
Channels to secondary actors:

1. System Administrator: PC-based system
2. Payment Gateway: Secure internet connection
3. Inventory Database: Internal system connection

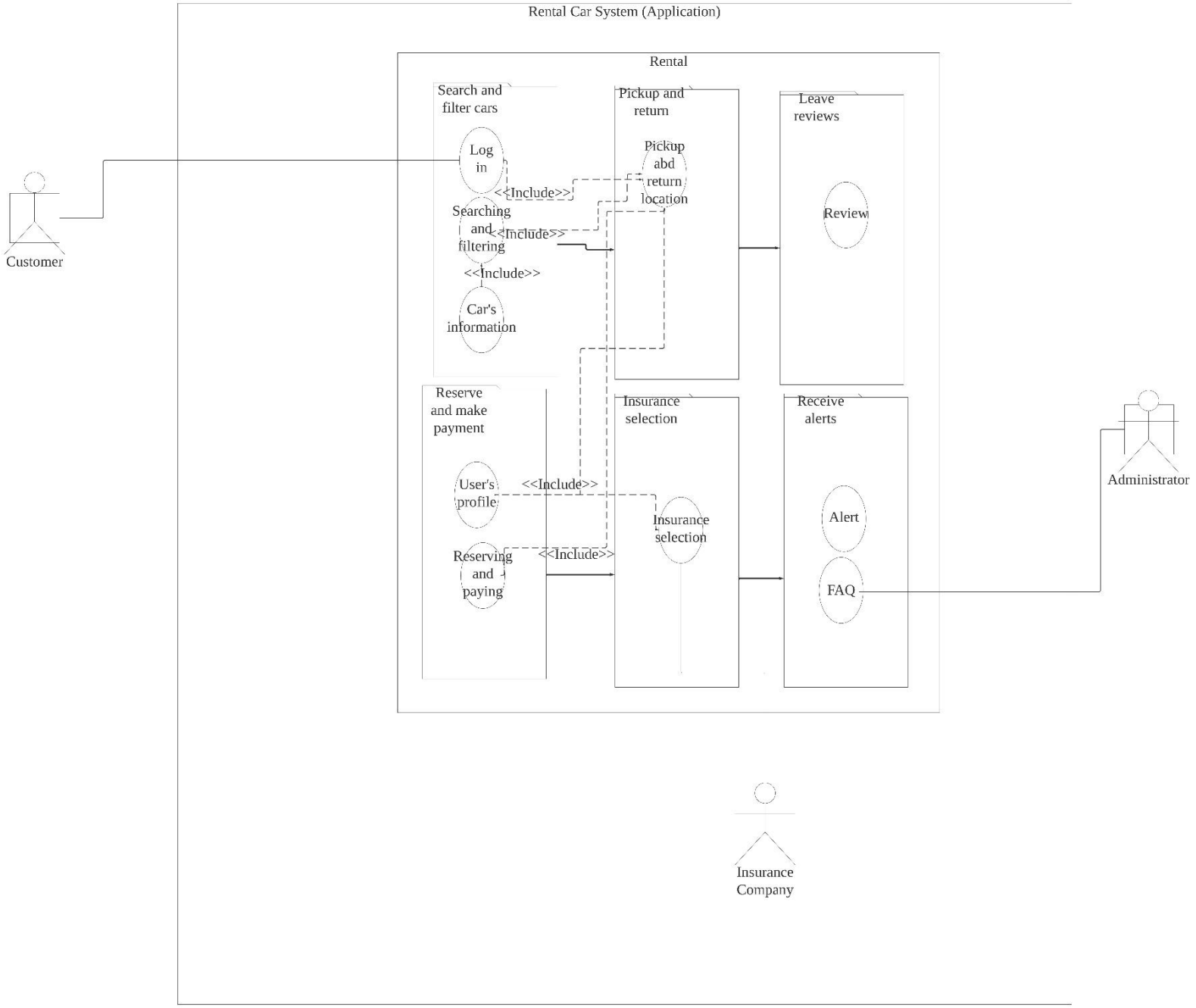
Open issues:

1. What mechanisms protect unauthorized use of the customer's payment information?
2. Is the system's response time during the payment process acceptable given the potential for high traffic?
3. How will the system handle high demand periods where multiple customers may be trying to reserve the same car at the same time?
4. How will the system ensure that the reservation process is user-friendly and intuitive, especially for first-time users?
5. Will the system offer a feature to save customer preferences for future reservations?
6. Will the system provide a feature for customers to modify or cancel their reservation after payment has been made?

Swimlane Diagram:



Deliverable #3 (in charge of Jin Hoi Lee)



Deliverable #4 (in charge of Seon Woo Lee)

Step 1:

The car rental mobile app functions by enabling customers to search and rent cars online. Customers can create accounts and provide personal details, including payment information. The app maintains a database of available cars, including their make, model, year, color, and rental rates. Customers can make rental reservations for specific cars and select rental dates. Upon confirmation, an order is generated with details such as the customer ID, car ID, rental dates, and total cost. Payment methods are securely stored and associated with the customer. The site also manages car categories and maintenance records. Customer reviews and ratings are collected for cars and the overall rental experience. The system interacts with customers through a user-friendly interface, accessible via a web browser or mobile app, allowing them to search, view car details, make reservations, and manage their bookings.

Potential Classes
Customer
Car
Rental Reservation
Order
Payment Method
Maintenance Record
Review
Location
Employees

Step 2:

Find nouns that fit the following categories.

Potential Classes	General Classification
Customer	External Entities
Car	Things
Rental Reservation	Things
Order	Things
Payment Method	Things
Maintenance Record	Things
Review	Things
Location	Places
Employees	Roles

Step 3:

Examine each noun against the class selection criteria.

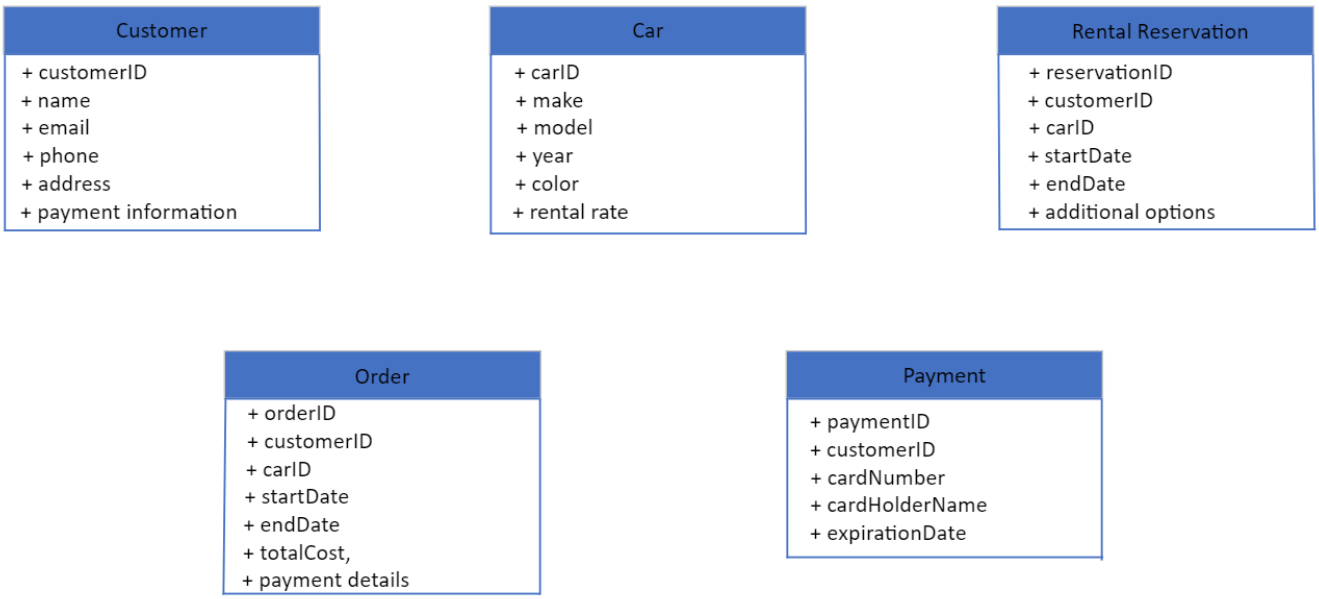
Class Selection Criteria

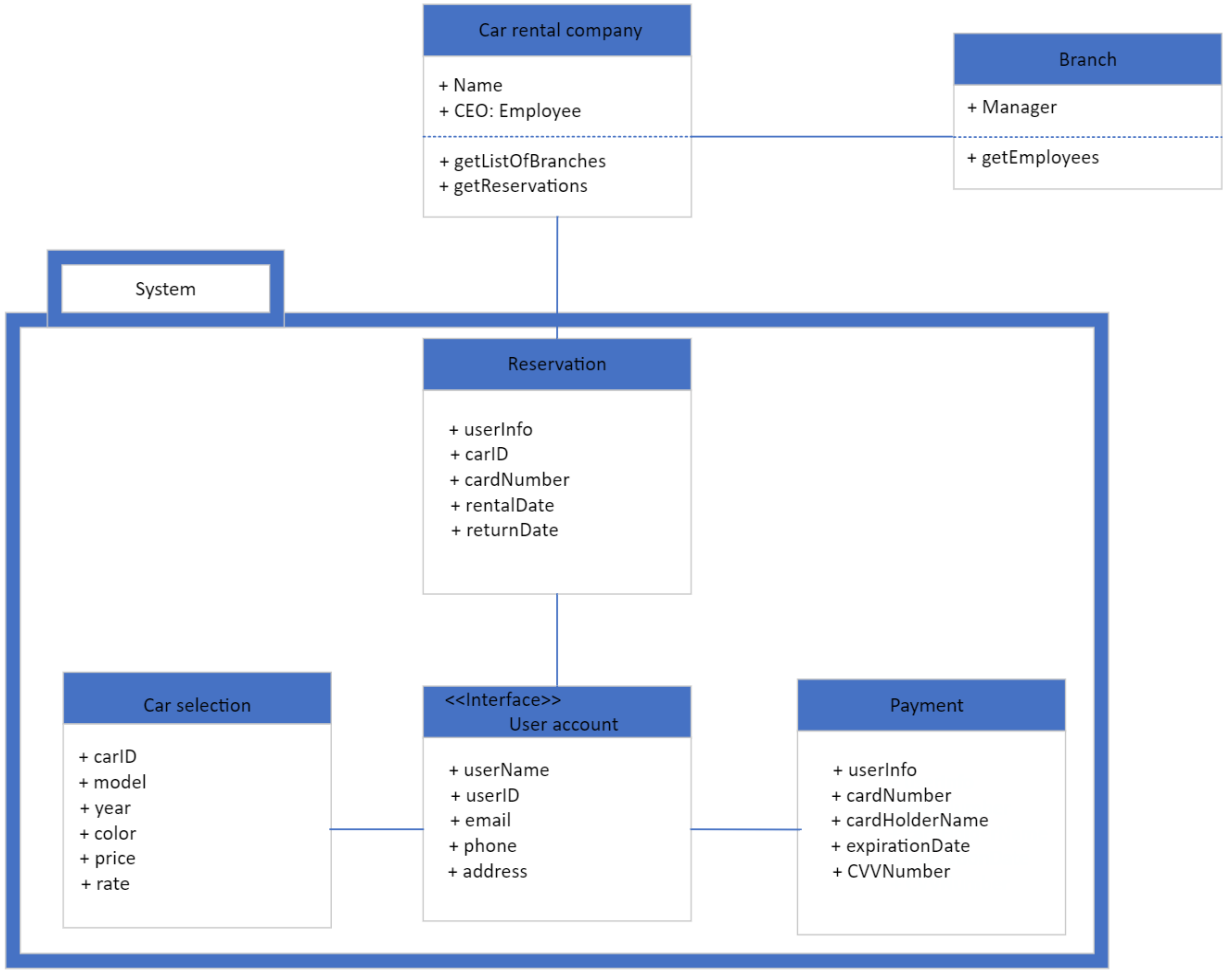
1. Contains information that should be retained or remembered
2. Provides needed services
3. Contains multiple attributes.
4. Has common set of attributes that apply to all class instances.
5. Has common set of operations that apply to all object instances.
6. Represents external entity that produces or consumes information.

Potential Classes	Characteristic Number That Applies
Customer	Apply All
Car	Rejected: 1, 2
Rental Reservation	Apply All
Order	Apply All
Payment Method	Apply All
Maintenance Record	Rejected: 1, 2
Review	Apply All
Location	Apply All
Employees	Apply All

Step 4:

Identifying the attribute for the selected classes




Car rental company
+ Name
+ CEO: Employee
+ getListOfBranches
+ getReservations
Branch
+ Manager
+ getEmployees
System
Reservation
+ userInfo
+ carID
+ cardNumber
+ rentalDate
+ returnDate
Car selection
+ carID
+ model
+ year
+ color
+ price
+ rate
<<Interface>>
User account
+ userName
+ userID
+ email
+ phone
+ address
Payment
+ userInfo
+ cardNumber
+ cardHolderName
+ expirationDate
+ CVVNumber

Deliverable #5 (in charge of Seon Woo Lee)

Class: Car	
Responsibility	Collaborator
Store car information	Rental Agency
Track car availability	Customer
Calculate rental fees Handle maintenance and servicing of cars	Maintenance Service

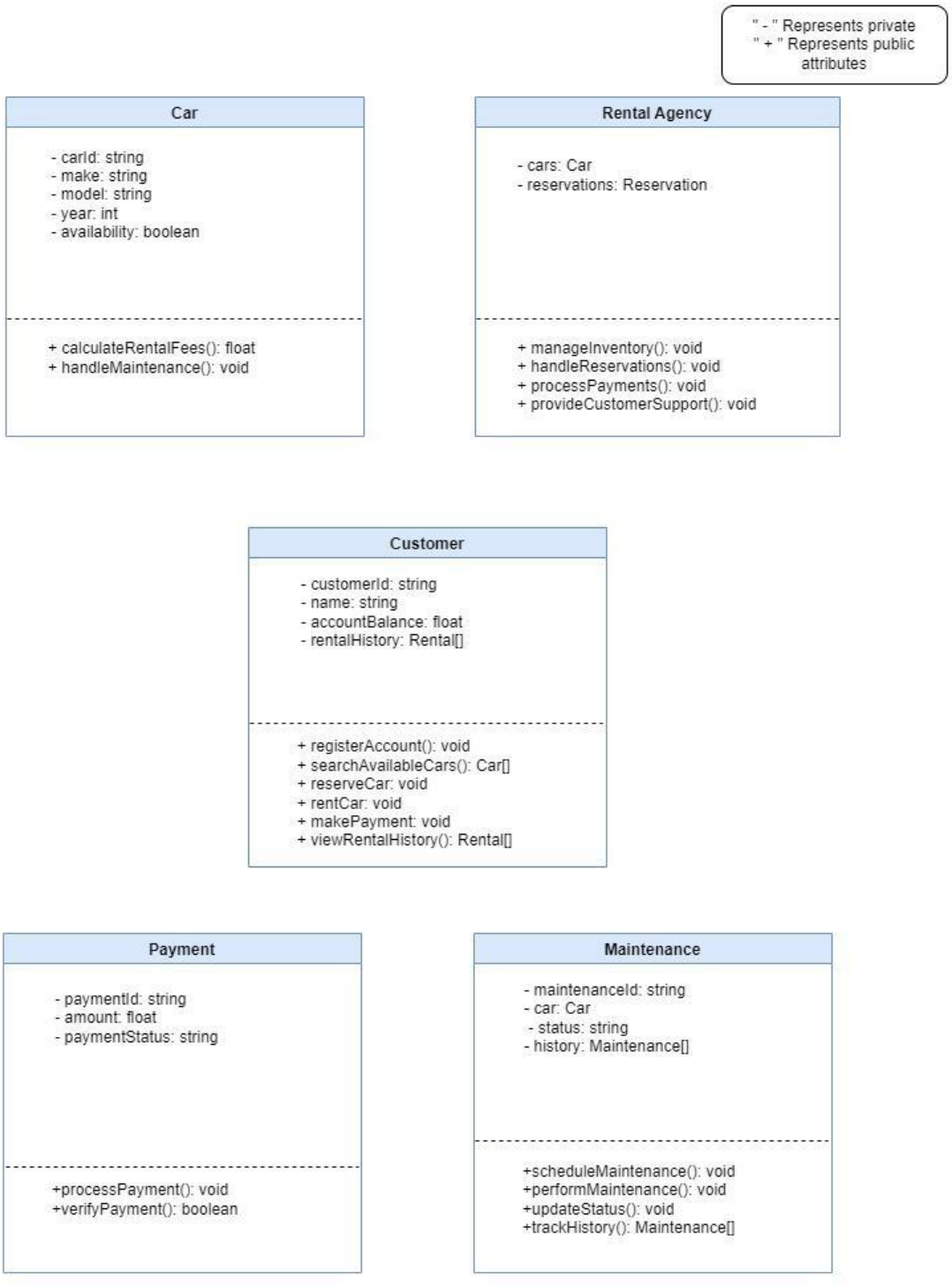
Class: Rental Agency	
Responsibility	Collaborator
Manage the inventory of available cars	Car
Handle car reservations and rentals	Customer
Process rental payments Provide customer support	

Class: Customer	
Responsibility	Collaborator
Register an account	Car
Search and browse available cars	Rental Agency
Reserve and rent Make payments	Payment Gateway
View rental history	

Class: Payment	
Responsibility	Collaborator
Process rental payments securely	Customer
Handle payment transactions	Rental Agency
Verify payment details	

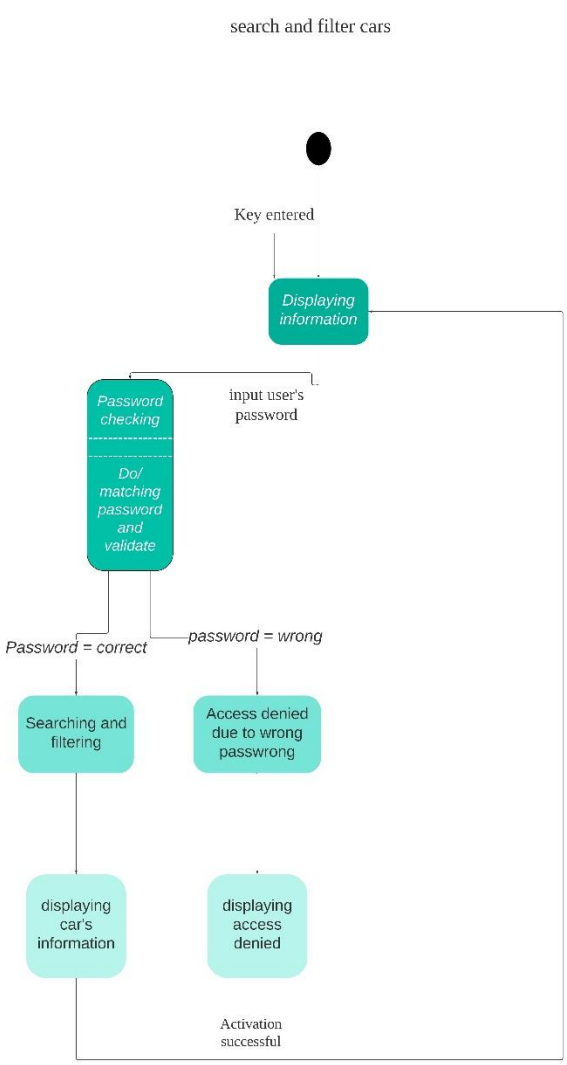
Class: Maintenance	
Responsibility	Collaborator
Schedule and perform car maintenance and repairs	Car
Update car status after maintenance	
Track maintenance history	

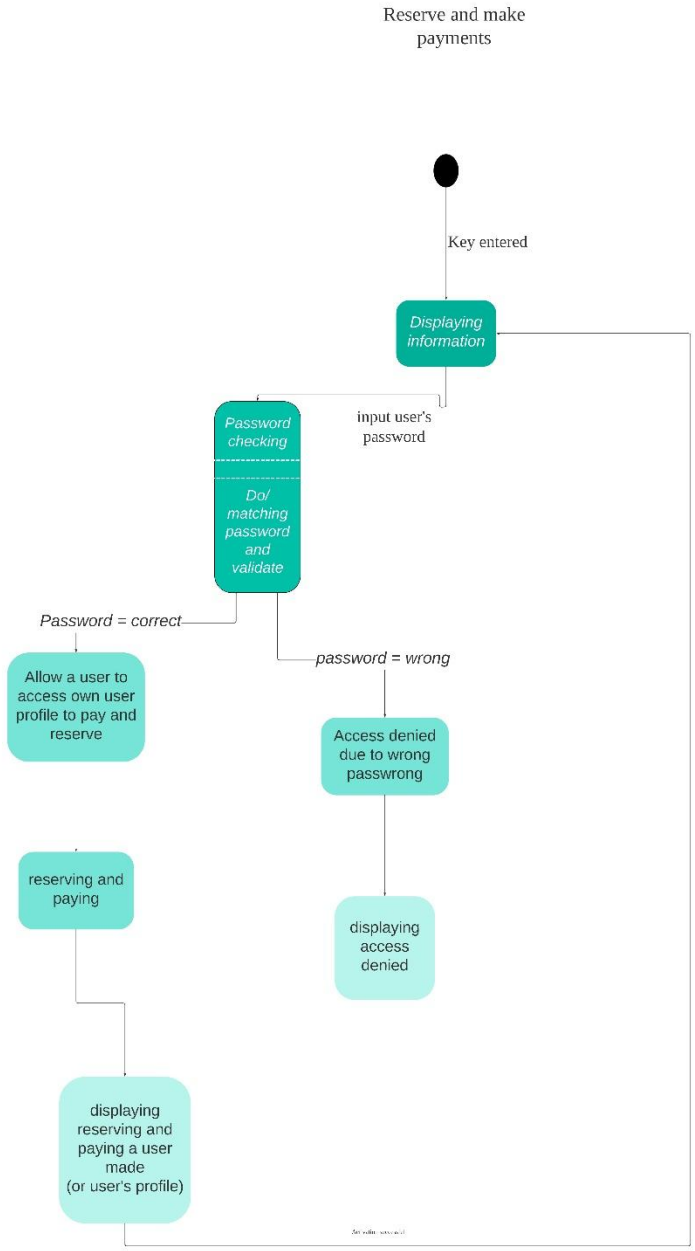
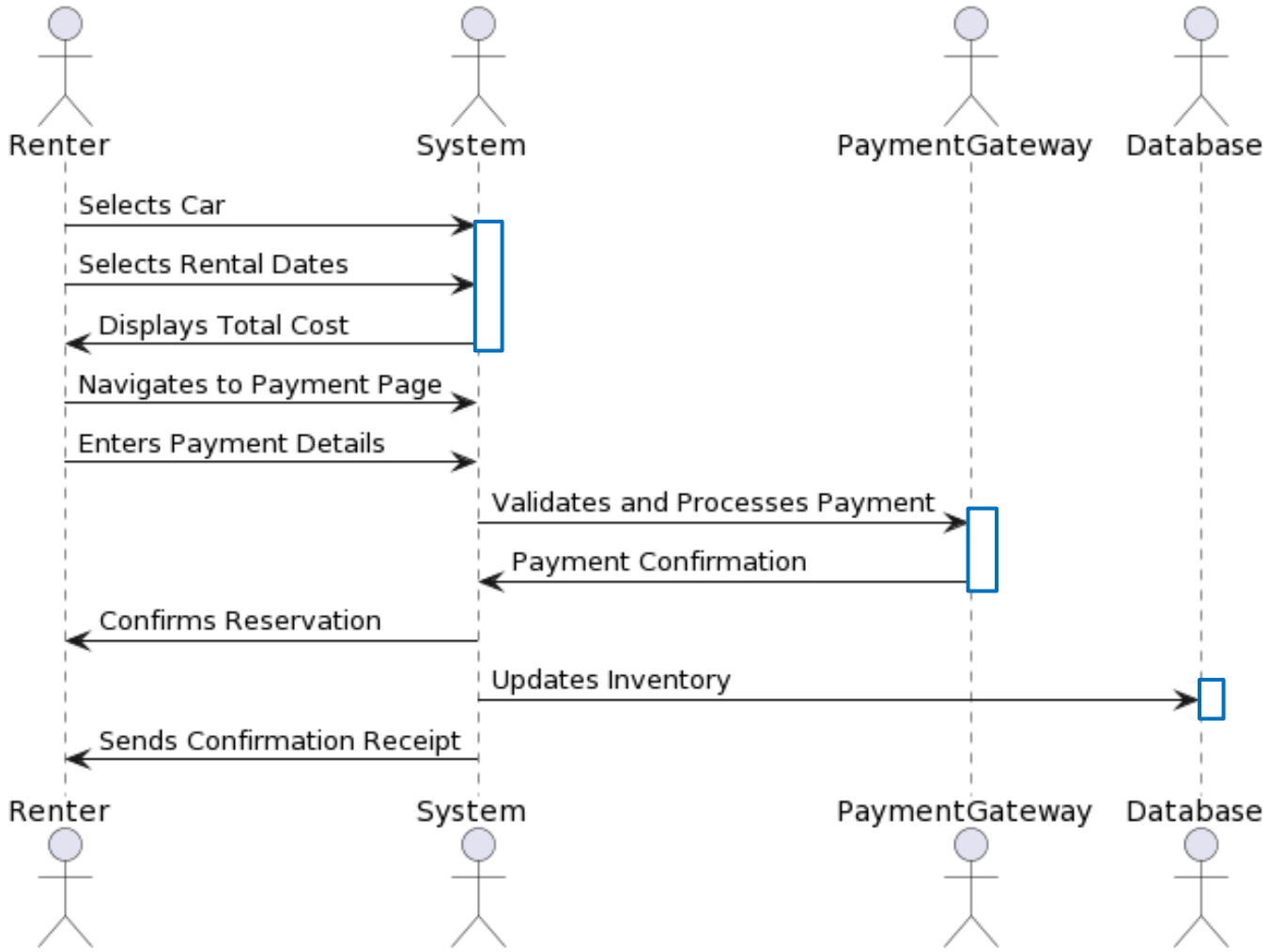
Deliverable #6 (in charge of MD Rifat Khan)



Part C

Deliverable #1 (in charge on Jin Hoi Lee)





Deliverable #2 (in charge on Adilet Masalbekov)