CAR RENAL WEB APPLICATION

SpringBoot-MySql-Hibernate

This is a documentation for the fulfilment of undergraduate degree program for the course of CS425

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1. Introduction

1.1 Problem Statement

The purpose of the project is to develop a required analysis, documentation and develop fully practical web app for a car rental (CR) application.

This project is designed so as to be used by Car Rental Company specializing in renting cars to customers. It is an online system through which customers can view available cars, register, view profile and book/reserve/rent car.

This is an E- commerce application to enable customers to rent cars over the Internet. The customer can view car to rent. After obtaining the info, the user can proceed with the car booking by supplying credit card details. These details will then be validated and the application will email the confirmation of the car rental arrangement to the customer's chosen email address and then update the car rental database accordingly.

For the purpose of this project, the scope of the CR system is limited to the following functionality: From the displayed search results, the customer should be able to request more detailed information about a particular vehicle type.

1. The customer must provide e- mail address. Sending of email is confirmed to the customer.
2. The customer should also be able to proceed with booking a car. After selecting this option, the customer will be able to check that the details for the rental transaction are correct.
3. Still prior to making the booking, the customer will need to enter personal information (such as name, address, telephone number and e- mail address) as well as payment information (credit card details).
4. When processing the booking request, the system will check the completeness and correctness of the customer's data entry (in particular, the credit card information). After successful validation of entered data, the system will confirm the booking with a rental confirmation number. As an additional confirmation of the booking, an e- mail will be sent to the customer's e- mail address. (future expansion)

In general, the CR system would have the functionality similar to other typical online car hire systems, such as https://www.enterprise.com

Table 1.1: problem statement table

The problem of	Rent car from this company, where ever you are you can rent whatever available cars.
Affects	Getting a rental car helps people get around despite the fact they do not have access to their own personal vehicle or don't own a vehicle at all.
a successful solution would be	This system increases customer retention and simplify vehicle and admin management.

Table 1.2 : Product Position Statement

For	Used to all legal Driver in the world
Who	Car rental company
The (product name)	is a online car rental
That	Easy way to look up rental car and to rent the car
Unlike	I do not use java fx
Our product	My product using html , css ,java script and spring

1.2 Goals of the Project

The main objective of this web app is to provide convenience to the user/client by developing a web app to make car rental process easier, faster and data driven.

In distinctive, the goals of Car rental system are:

- To create conveniences, availability and quality service the clients.
- To build data driven web app that has direct access to admin through web application system.

The car rental system is a web based application system. The main users of this system are administrator, client (Renter) and any hired admin by administrator.

There are six modules in the car rental web. The modules are:

1. Client Information User can register, login, view and update client information.
2. Admin Information There are two users that are admin and client. Admin can add, view, update and delete client information.
3. Car Information can add, view, update and delete car information.
4. admin will update booking information.
5. Returning User can update rental information status to return and system will record the time and record the car is being returned.
6. Report Producing the reports associated with the renting car. The system is a multi-user system since it is used by different groups of users. It is developed to be used on any operating system platform. (future plan)

The goals of the project is using internet where ever you are select any available Car in rental

Company, then this Car if the Customer registered and non-registered user will be able to see

Car rental by price and model.

Admin can get benefit because it manages the booking of cars by show available cars for client and always records every single booking to easy the company report so that admin can just print the report.

1.3 Stake Holders

Table 1.3 : Stakeholder Summary

Name	Description	Responsibility
Admin	Add car, view list of car, edit car, delete car, login , view detail of the car and return the car on the system	Admins are responsible for check out the car and check in the car, if there is new car add that car to database, if the company want to trash the old car the admin will be delete that car.
User	List of car view, view car detail and to the system the user have to give information of specific time and if the user do not have account they have to be sign up Account else log in on the system	The user responsibility is first sign up, specify time or how long take that car,
Developer	Developers develop system on the basis of given document.	Developers are responsible for developing system feature, fixing bug, and maintain the system's availability.
Tester	Tester use jUnit tool to test system or integration test.	Tester are responsible for integration testing.

1.4 Motivation for the project

Reason for the project is The advancement in Information Technology and internet penetration has greatly enhanced various business processes and communication between companies (services provider) and their customers of which car rental industry is not left out. This E-Car Rental System is developed to provide the following services:

- Enhance Business Processes: To be able to use internet technology to project the rental company to the global world instead of limiting their services to their local domain alone, thus increase their return on investment (ROI).
- Online Vehicle Reservation: A tools through which customers can reserve available cars online prior to their expected pick-up date or time.
- Customer's registration: A registration portal to hold customer's details, monitor their transaction and used same to offer better and improve services to them.

2. Analysis and Design

2.1 Functional reequipments

These are statements of services the system should provide, how the system should react to particular inputs, and how the system should behave in particular situations. It specifies the application functionality that the developers must build into the product to enable users to accomplish their tasks.

2.1.1 Reservation:

- The system must allow the customer to register for reservation.
- The system shall allow the customer to view detail description of particular car.
- The system must notify on selection of unavailable cars while reservation.

- The system must allow the customers to select specific car using different search category while reservation.
- The system must view list of available car during reservation.
- The system shall allow the employee to update reservation information.
- The system shall allow the admin to view reservations made by customers.
- The system must be able to provide a unique reservation successful message for all successfully committed reservations.

2.1.2 Log in:

- The system should allow admin to login to the system using their username and password.
- The system should allow customer to login to the system using their username and password.
- The system shall allow admin to logout.
- The system shall allow customer to logout.

2.1.3 Car:

- The system should allow admin to register new cars.
- The system shall allow admin to select cars in the list.
- The system shall allow customer to select cars in the list.
- The system shall allow admin to update information of the car in need of modification(future plan).
- The system shall allow admin to display all lists of car.
- The system shall allow admin to display all available car.
- The system shall allow customer to display all available car.
- The system shall allow admin to display all reserved car.
- The system shall allow admin to display all off duty car.

2.2 Nonfunctional reequipments

Non-functional requirements, as the name suggests, are requirements that are not directly concerned with the specific services delivered by the system to its users. They may relate to emergent system properties such as reliability, response time, and store occupancy. Alternatively, they may define constraints on the system implementation such as the capabilities of I/O devices or the data representations used in interfaces with other systems. Non-functional requirements, such as performance, security, or availability, usually specify or constrain characteristics of the system as a whole.

2.2.1 Usability:

The system provides a help and support menu in all interfaces for the user to interact with the system. The user can use the system by reading help and support.(future plan)

2.2.2 Performance:

The system response time for every instruction conducted by the user must not exceed more than a minimum of 10 seconds. The system should have high performance rate when

executing user's input and should be able to provide response with a short time.

2.2.3 Availability:

The system should always be available for access at 24 hours, 7 days a week. Also in the occurrence of any major system malfunctioning, the system should be available in 1 to 2working days, so that business process is not severely affected.

2.2.3 Error handling:

Error should be considerably minimized and an appropriate error message that guides the

User to recover from an error should be provided. Validation of user's input is highly essential.

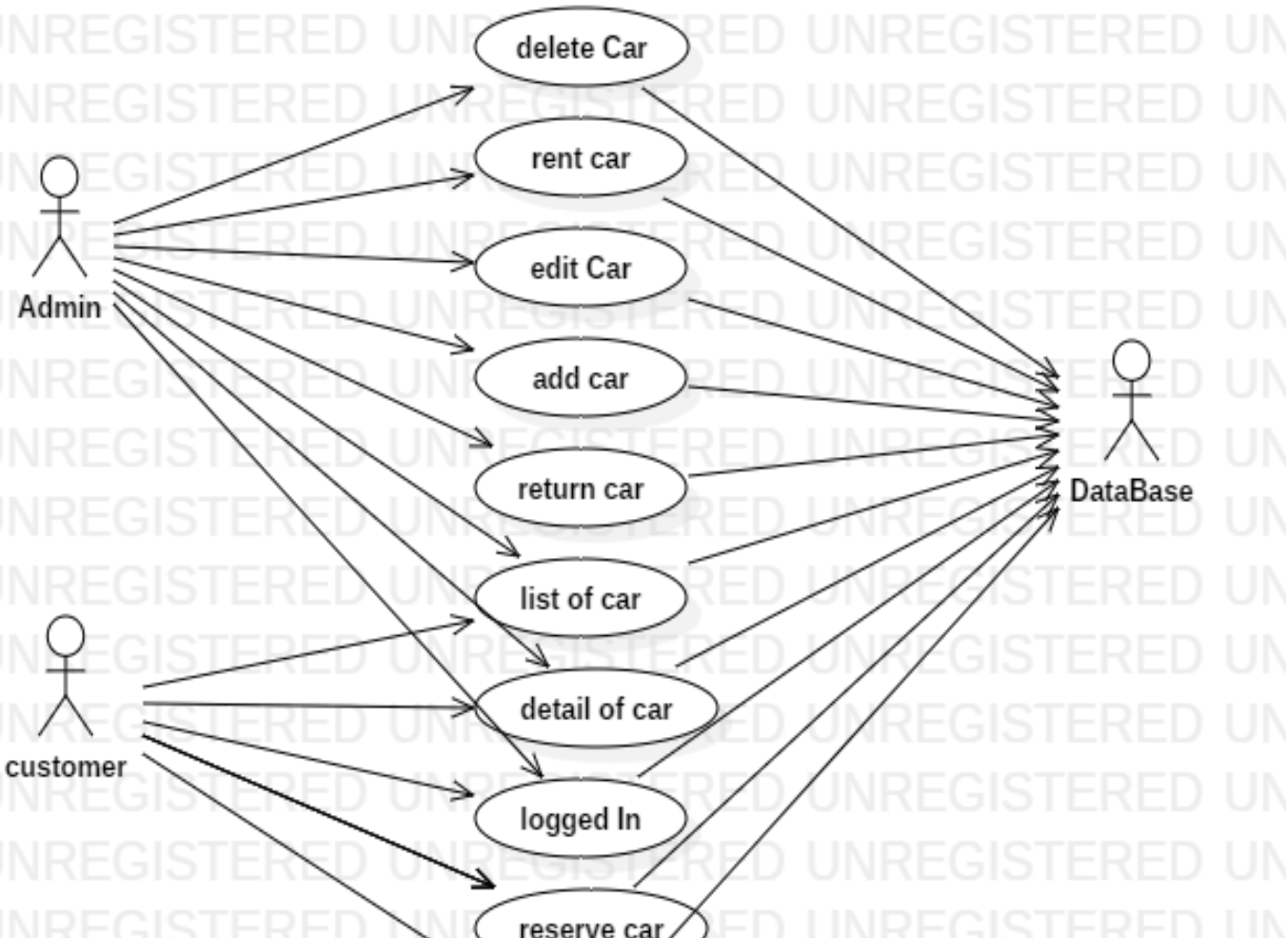
2.2.4 Ease of use:

Considered the level of knowledge possessed by the users of this system, a simple but quality user interface should be developed to make it easy to understand and required less training.(future expansion)

2.3 Use case

2.3.1 Use case Diagram

Fig 2.3.1 Use case Diagram



2.3.2 Use case Descriptions

Use Case Number: 1		
Brief description	This use case allows the admin to add car, view car, delete ,and edit car	
Actors	Admin	
Preconditions		
The admin must logged in to the system		
Flows of Events:		
1. Basic Flows		
1.1.0 Add Car		
Step	User Actions	System Actions

1	Click addCar button	The system display add car form
2	The Admin fills out the form and requests the system to save the details	The system verifies that there's no other car in the database with the same vin number and saves the car and returns the success message on success or a fail message in case of failure.
Postconditions		
The Car is persisted in the system		
Business Rules		
No the same Cars. A unique profile is identified by vin number.		
1.1.1 view all car list		
Step	User Actions	System Actions
1	The admin selects to view a list of car	The system returns a list of all cars.
Postconditions		
Display all cars		
Business Rules		

The rented cars are not display.		
1.1.2 view car detail		
Step	User Actions	System Actions
1	The admin selects to view a list of car	The system returns a list of all cars.
2	The admin select to detail of one car	The system display detail information about the car
Postconditions		
Detail information about selected one car		
Business Rules		
The rented cars are not display.		
1.1.3 edit car		
Step	User Actions	System Actions
1	The admin selects to view a list of car	The system returns a list of all cars.
2	The admin select to detail of one car	The system display detail information about the car

3	The admin select Car they want to update	The system displays an editable car form pre-populated with the car details
4	The admin updates the fields they want to update and requests system to save the new details	The system updates the record and returns the success message or a fail message on exception.
Postconditions		
Update information about selected one car		
Business Rules		
The vin number field should be Unwritable		
1.1.3 delete car		
Step	User Actions	System Actions
1	The admin selects to view a list of car	The system returns a list of all cars.
2	The admin select to detail of one car	The system display detail information about the car
3	The admin selects to delete a car from a list of car	The system displays a confirmation dialogue window
4	The admin selects OK on the confirmation dialog window to confirm deleting the profile	The system confirms the faculty is not assigned to any sections or blocks and deletes the car. The system returns

		message a success message on success or a failure message.
Postconditions		
The car will be deleted		
Business Rules		
Remove all information from everywhere.		
1.2.0 check out the car		
Step	User Actions	System Actions
1	The admin selects to check out the car	The system displays an check out form pre-populated with the car details
2	The admin fill out all requirement and then press submit button.	The system hide the car and returns the success message or a fail message on exception.
Postconditions		
the user want one car then rent that car		
Business Rules		
The rented car will be disappear.		

1.2.1 check in the car		
Step	User Actions	System Actions
1	The admin selects to check in the car	The system displays an check in form
2	The admin fill out the requirement and then press submit button.	The system show the car and returns the success message or a fail message on exception.
Postconditions		
The user return back the car		
Business Rules		
The rented car will be display on the page.		

Use case Number:2
Brief description this use case provided a user side page.
Actors user
Preconditions
The user no need to logged in to the system
Flow of Events:

1.Basic Flows		
1.0 list of car view		
Step	**User Actions**	**System Actions**
1	The user open the website	The system returns a list of all cars.
Postconditions		
Display all cars		
Business Rules		
The rented cars are not display.		
1.1 view car detail		
Step	**User Actions**	**System Actions**
1	The user open the website	The system returns a list of all cars.
2	The user select to detail of one car	The system display detail information about the car.
Postconditions		
Detail information about selected one car		
Business Rules		

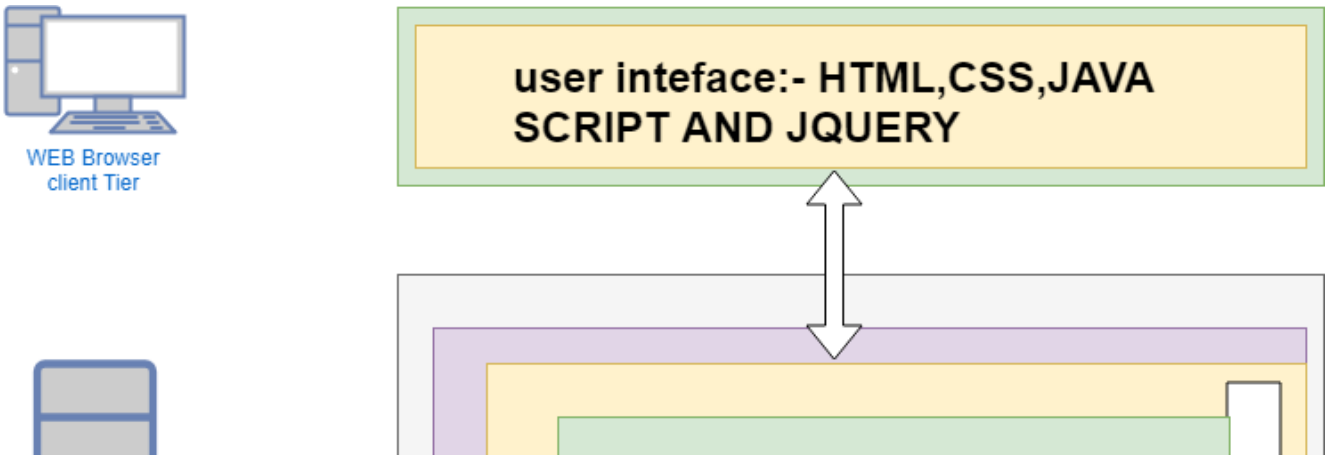
The rented cars are not display.		
1.2 sign up		
Step	**User Actions**	**System Actions**
1	The user select sign up button	The system display sign Up form
2	The user fill out the form and requests the system to submit the form	The system verifies there is no the same profile in the database with same email address and saves the user and return the success message on the success or a fail message in case of failure.
Postconditions		
The user is persisted in the system		
Business Rules		
No the same user. A unique profile is identified by email address.		
1.3 log in		
Step	**User Actions**	**System Actions**
1	The user select log in button	The system display log in form

2	The user fill out the requirement form and requests the system to submit the form	The system check user name and password, if its match log in the page, or do not match display fail message on the failure.
Postconditions		
The user access the system.		
Business Rules		
The user name is not same as other user name.		
1.4 reservation		
Step	**User Actions**	**System Actions**
1	The user open the website	The system returns a list of all cars.
2	The user select to detail of one car	The system display detail information about the car.
3	The user select rent car or request to the system	The system ask log in first then display form
4	The user fill out the form and requests the system to submit the form	The system display rent car form
5	The user fill out the form and requests the system to submit the form	The system display success full or if it is fail display fail.

Postconditions
The user rented car online.
Business Rules
The rented car will be disappear from the website or hide it.

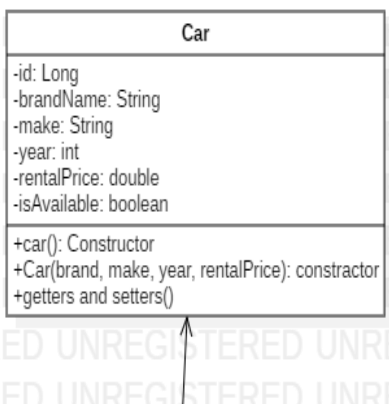
2.4 System Architecture

Fig: 2.4.1 System Architecture



2.5 Class Diagram

Fig: 2.5 Class Diagram



2.6 Sequence Diagram

Fig: 2.6.1 sign up sequence diagram

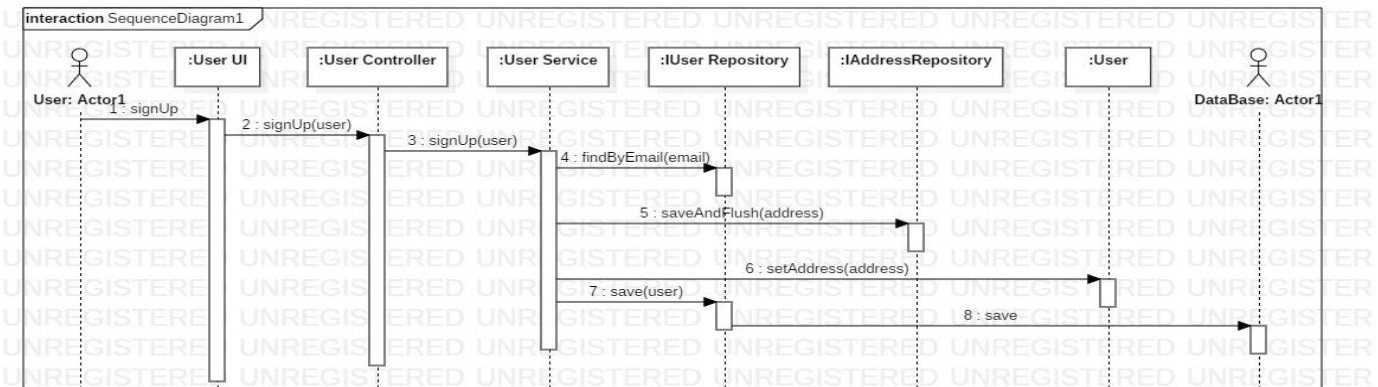


Fig: 2.6.2 add car sequence diagram

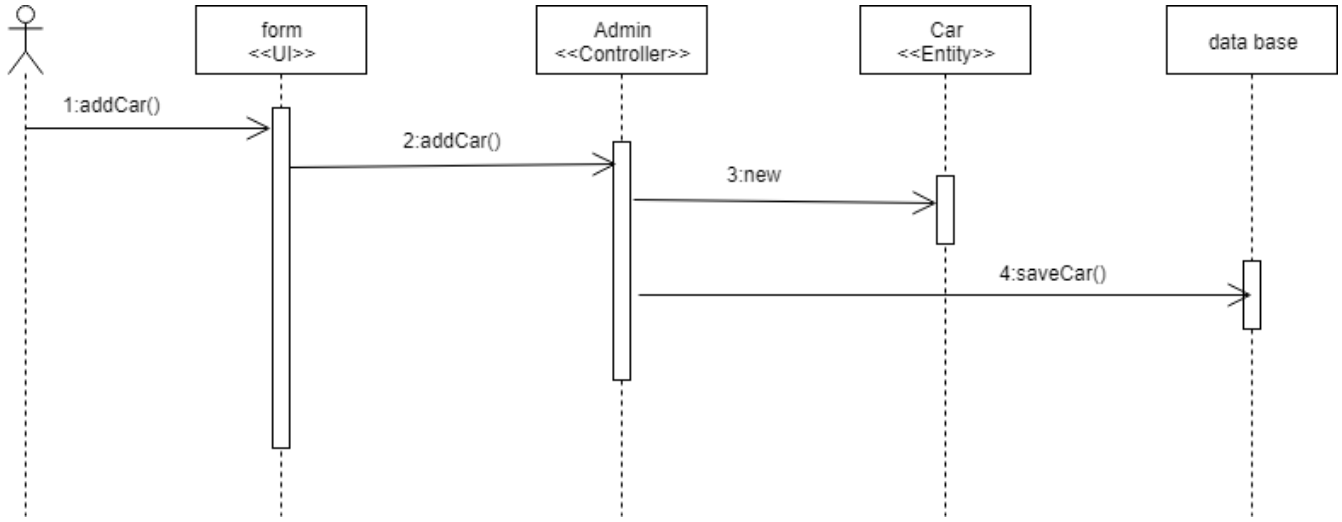
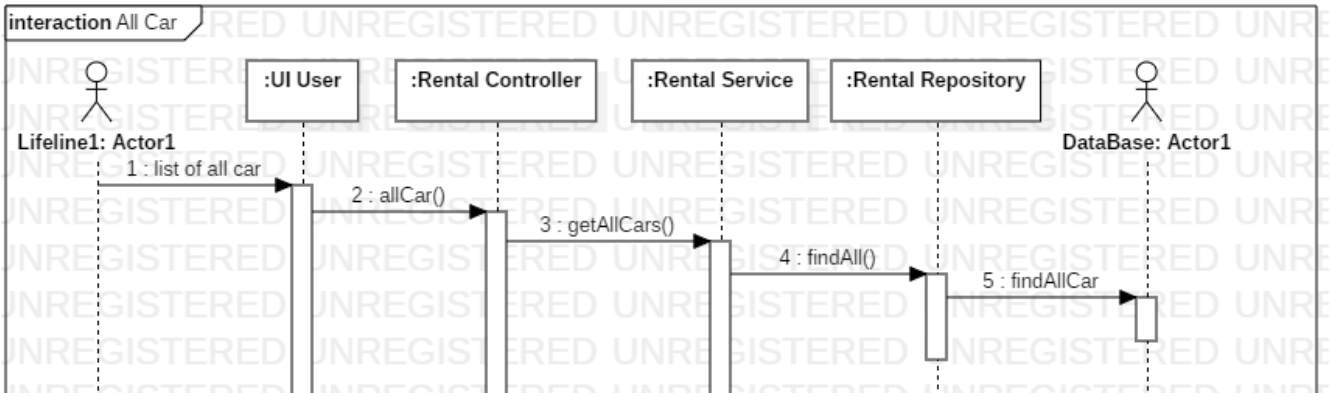


Fig: 2.6.3 all car sequence diagram



2.7 Collaboration Diagram

Fig: 2.7.1 sign up collaboration diagram

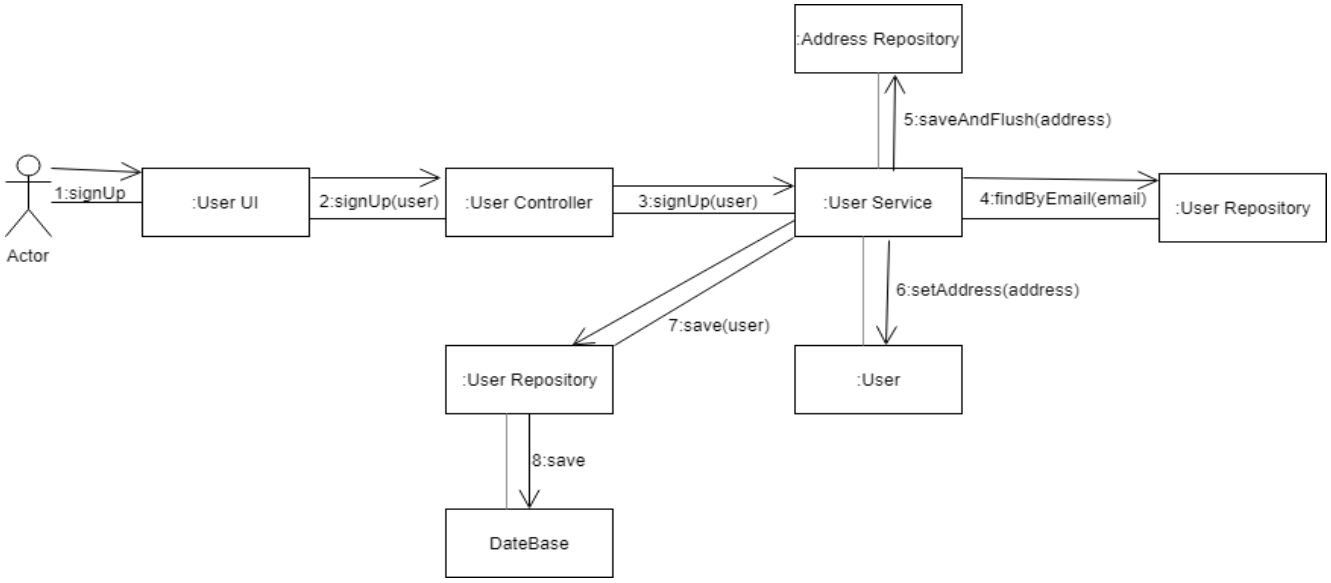


Fig: 2.7.2 add car collaboration diagram

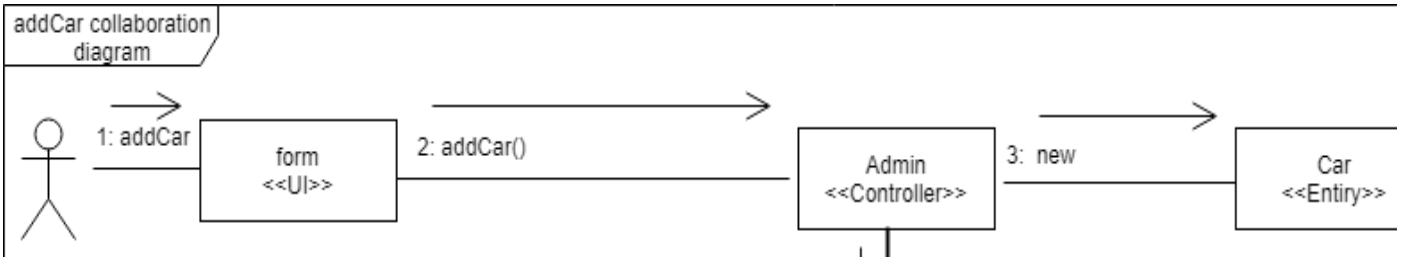
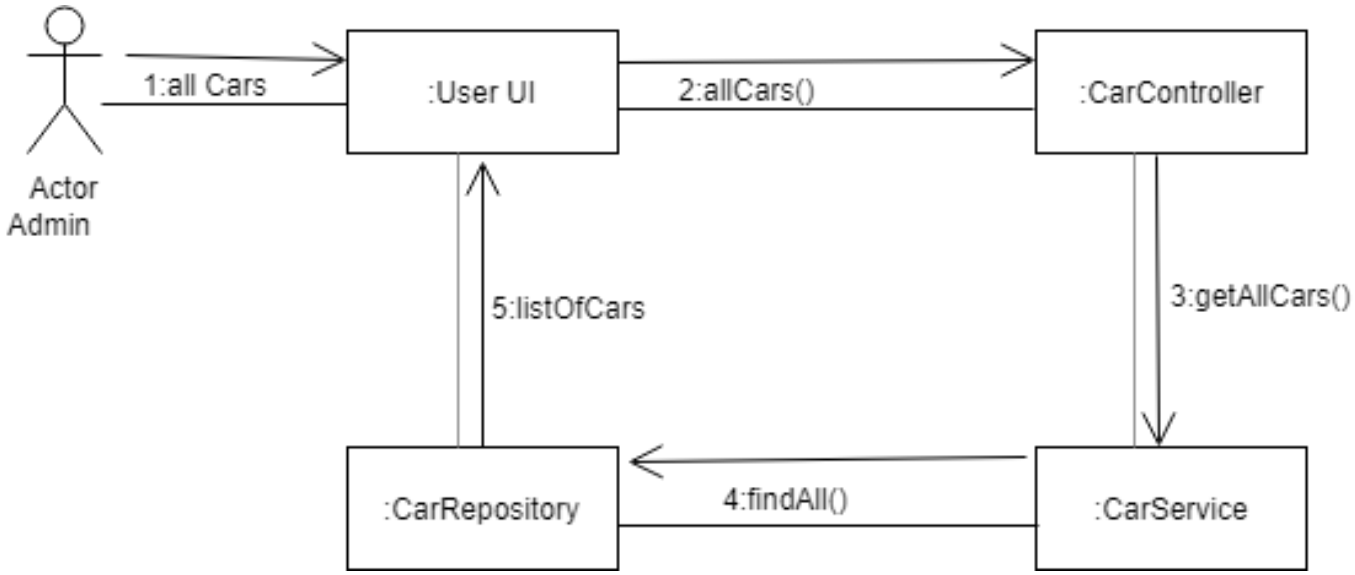


Fig: 2.7.3 list of car collaboration diagram



3. Conclusion

3.1 Problem Solution

This days booking/reserving a can is easy as never before; modern web apps plays an important role in the market share.

For the future this web app can be expand to give more convenient service for the client. The web based car rental system has offered an advantage to both customers as well as Car Rental Company to simplify the hardship to rent.

As the starting project the car rental system fulfils the basic structure of the client

admin connection and gives the basic requirements for the client to access the rental institution through web.

3.2 Future Plan

The following are the basic system to be added in the current app

1. payment
2. add reviews of the client experience
3. Authentication system
4. more front end development …etc

4. SCI Point

The great achievement of modern computer technology are based on the concept of the computer programing, which is series of instruction that guide the internal activity of the computer, reflecting the eternal self-referral programming in the unified field responsible for all activity of the universe. All outer activity of the computer an resultant organizing power originates from these computer programing, which are a concept expression of knowledge structured from the consciousness of human programmer. This is true of both major classes of computer programs: system program, which control and allocate the hardware resource of the of the computer, and application programs, oriented toward specific areas such as education , administration, business, science and technology, defense, transportation or communication. Thus, the outer manifest activity of the computer has its source in an unmanifest structure of knowledge, the computer program, which originates from the quiet level of human consciousness having its basis in the self-referral activity of the unified field.

Use case sci:

Use case are the unifying thread that runs through all stages of the development lifecycle. Therefore, proper formulation of the use cases is a central key for a successful project. Success in life also requires access to the thread that ties all diversity together.

Bringing awareness to this unified level of life brings the ability to handle the diversity of circumstances, challenges, and personalities that one faces in life.

Sequence diagrams:

Sequence diagram document the sequence of calls different objects make to accomplish a specific task.

Likewise, harmony exists in diversity: even though each object is specialized to only perform tasks related to itself, objects harmoniously collaborate to create functionality far beyond each object’s individual scope.