* *USE CASE : Register Account.*

***Id****: UC1 (Use Case 1)*

***Description***

***Visitor*** wants to create an account for the Car-Sharing Service.

***Actors***

***Visitor.***

***Pre-Conditions***

The ***Visitor*** *connects to the* ***Company’s Car Sharing*** *Web Site/ Application and selects the function “Sign Up”.*

**Flow of events**

1. *The* ***System*** *returns a form to enter all the required data: Name, Surname, Birth date, Social Security Number, ID Card Number, Driving License number and Credit Card number. It also asks for an Email address and a password which will be used for the future logins.*
2. The ***Visitor*** *fill the forms with all the required information.*
3. *The* ***System*** *stores the request together with all the data provided with it, generates a random activation URL and asks the* ***Mail System*** *to forward his/her URL to the email address of the* ***Visitor****.*

***Post-Conditions***

The ***Mail System*** *sends the activation URL to the* ***Visitor’s*** *email provided in the registration form.*

***Alternative flow of events***

*2a The* ***System*** *recognizes invalid or missing data in the form compiled by the* ***Visitor*** *and informs him/her of the error. The flow of events restarts from point 1.*

*2b The* ***Visitor*** *inserts in the form a Social Security Number, or ID Card Number, or Driving License number, or Email Address, which is already present in the* ***System.*** *The* ***System*** *shows an error message saying that some of those credentials were already been inserted into the* ***System*** for another account***.*** *The flow of events restarts from point 1.*

* *USE CASE : Activate Account.*

**Id**: UC2

**Description**

The ***Visitor*** wants to activate his/her/her account.

**Actors**

***Visitor.***

**Pre-Conditions**

The ***Visitor*** has received the activation URL on his/her mail box.

The ***Visitor*** clicks on the received activation URL.

**Flow of events**

1. The ***System*** acknowledges that the ***Visitor*** has arrived in his/her activation Web Page and activates his/her account.

**Post-Conditions**

The ***Visitor*** has now become an ***User*** which can access the ***System*** using the credentials (Email, password) he/she provided during the registration phase.

* *USE CASE : Log in*

**Id**: UC3

**Description**

The ***User*** wants to log in the ***System***.

**Actors**

***User.***

**Pre-Conditions**

The ***User*** *connects to the* ***Company’s Car Sharing*** *Web Site/Application and selects the function “Login”.*

**Flow of events**

1. The ***System*** shows the ***User*** a login form, asking him/her to insert his/her account Email and password.
2. The ***User*** inserts the pair (Email, Password) used during the registration phase and selects the function “Login”.

**Post-Condition**

The ***System*** verifies the existence of an account associated with that pair (Email, Password) and logs the ***User*** in; the ***User*** has now access to the System functionalities.

**Alternative Flow of Events:**

3a The ***System*** doesn’t find an account associated with that pair (Email, Password) and shows an error message, the flow of events restarts from point 1.

* *USE CASE : Log out*

**Id**: UC4

**Description**

The ***User*** which is logged in the ***System*** wants to exit.

**Actors**

***User***

**Pre-Conditions**  
The ***User*** *is logged in the* ***System*** *and selects the “Logout” function on the* ***Company’s Car Sharing*** *Web Site/Application.*

**Flow of events**

1. The System performs the ***User***’s logout.

**Post-Condition**

The ***System*** shows the confirmation of the logout to the ***User***; the ***User*** is now unable to use the ***System*** functionalities dedicated to **User**s.

* *USE CASE : Locate available car.*

**Id**: UC5

**Description**

The ***User*** wants to locate a **Car**.

**Actors**

***User*.**

**Pre-Condition**

The ***User*** must be logged into the ***System*** and select “Locate Cars” function in ***Company’s Car Sharing*** *Web Site/Application.*

**Flow of events**

1. The ***System*** shows a text box asking the ***User*** to provide an address near which he would like to see the **C*ars*** whose state is *Available*.
2. The ***User*** inserts the desired address and selects the “Locate” function.

**Post-Condition**

The ***System*** shows the ***User*** a map containing all the **Cars**, whose state is **Available,** which are inside a certain distance range from the given address.

**Alternative flow of events**

2a The ***User*** selects the function “Near me” instead of inserting a specific address.

3a The ***System*** retrieves the ***User***’s GPS coordinates and shows him/her a map containing the **Cars**, whose state is **Available,** which are inside a certain distance range from the ***User’***s position.

2b The ***System*** does not find the inserted address and informs the ***User.*** The Flow of Events restarts from point 1.

2c There are no available **Cars** in the specified address/***User’***s Position. The System informs the **User.** The Flow of Events restarts from point 1.

* *USE CASE : Reserve available car.*

**Id**: UC6

Description

The ***User*** wants to reserve a ***Car.***

Actors

***User***

**Pre-Condition**

The ***User*** chooses a specific ***Car*** between the available ones showed in the map.

Flow of events

1. ***User*** selects the function “Reserve this Car”.
2. The ***System*** stores the ***Reservation*** of the ***Car*,** changing the ***Car*** status in *Reserved***.**

Post-Condition

The ***System*** activates a countdown of 1 hour during which the ***User*** will have the possibility to unlock the reserved ***Car.***

* *USE CASE : Reservation Expiration.*

*ID : UC8*

*PARTECIPATING ACTORS :* ***User***

*PRE-CONDITION :* The ***User*** *didn’t unlock the* **Car** *in the available 1-hour time slot after the reservation of the* ***Car****.*

*FLOW OF EVENTS :*

1. The 1 hour reservation countdown expires without having the ***User*** unlock the car.
2. The ***System*** cancels the reservation of the ***User*** on that car, making it available again;

*POST-CONDITION :*

The ***System*** communicates to the ***Banking System*** the amount of money (corresponding to the fee of 1 EUR) to charge to the ***User***.

The ***System*** now allows the ***User*** to perform another reservation.

* *USE CASE : Unlock Car.*

*ID : UC9*

*PARTECIPATING ACTORS :* ***User***

*PRE-CONDITION : The* ***User***  *has previously reserved a car and activates the function “Unlock Car” on the* ***Company’s Car Sharing*** *Web Site/Application.*

*FLOW OF EVENTS :*

1. The ***User*** sends his/her GPS coordinates to the ***System***;
2. The ***System*** checks if the GPS coordinates of the specific ***User*** ’s *Reserved* ***Car*** and the GPS coordinates of the ***User*** himself are in a specified distance range.

*EXCEPTION :*

If one hour has passed since the reservation has been done and the ***User*** didn’t unlock the ***Car***, the reservation expires and the ***User*** cannot unlock the car anymore unless with another reservation. The ***System*** changes the ***Car*** status to Available.

*POST-CONDITION :*

The ***System*** has verified that ***User*** is nearby the car (inside the specified distance range) and unlocks the ***Car*** doors. The ***System*** now changes the ***Car*** status to *In Use.*

(We take as an assumption that after the doors of the cars are unlocked the **User** always enters the car and ignites the engine.)

* *USE CASE : Drive Car.*

*ID : UC10*

PARTECIPATING ACTORS : ***User***

PRE-CONDITION : The ***User*** starts the engine of the ***Car*.**

FLOW OF EVENTS :

1. The ***System***starts the Ride Timer which indicates the time usage of the ***Car***.
2. [Extension Point UC11].
3. [Extension Point UC14].
4. The ***System*** calculates the current fee charged to the ***User*** (calculated as a given amount of money per minute multiplied by the minutes of the Ride Timer) while showing it on the on-board screen.

*POST-CONDITION :*

The ***User*** can now drive the ***Car***.

* *USE CASE : Drive with Passengers. <<extends UC10>>*

*ID : UC 11*

*PARTECIPATING ACTORS :* ***User***

*PRE-CONDITION :* The***User*** takes passengers with him in the ***Car*** for the ride.

FLOW OF EVENTS :

The ***System*** verifies that there are passengers in the ***User***’s ***Car.***

*POST-CONDITION :*

The ***System*** stores that the ***User*** will have a discount on the fee of his/her last ride.

* *USE CASE : End ride.*

*Id : UC12*

*PARTECIPATING ACTORS :* ***User***

*PRE-CONDITION :* The***User*** parks the ***Car*** in one of the ***Safe Area****s* and exits the ***Car***.

FLOW OF EVENTS :

1. The ***System*** verifies that no one is in the car.
2. The ***System*** checks the ***battery*** status***.***
3. [Extension Point UC13].
4. The ***System*** checks, using the GPS coordinates, if the ***User*** has left the ***Car*** within a certain distance range from the nearest station.
5. The ***System*** checks if ***User*** drove with passengers (UC11).
6. The ***System***, after a predefined (short, order of minutes) amount of time, checks if the ***Car*** is plugged.
7. The ***System*** applies discounts or surcharges to the final ***fee*** according to the previous checks and actions in the points 2-3-4-5-6 of the Flow of Events.

*POST-CONDITION :*

The ***System*** locks the doors of the ***Car.***

The ***System*** communicates to the ***Banking System*** the final ***fee*** to charge to the***User.***

* *USE CASE : Plug the Car. ( <<extends UC12>> )*

*ID : UC13*

*PARTECIPATING ACTORS :* ***User***

*PRE-CONDITION :* The***User*** has parked the ***Car*** in one of the ***Charging Area***s designated by the ***System*** and plugs the ***Car*** into the power grid.

FLOW OF EVENTS :

The ***System*** detects that the ***Car*** is plugged within a (short) specified time period after the end of the ride.

*POST-CONDITION :*

The ***System*** stores that the ***User*** will have a discount on the fee of the ***User***’s last ride.

* *USE CASE : Enable Money Saving Option. ( <<Extends UC10>> )*

*ID : UC14*

*PARTECIPATING ACTORS :* ***User***

*PRE-CONDITION :* The***User*** enables the Money Saving Option.

FLOW OF EVENTS :

1. The ***System*** asks the ***User*** the address of his final destination showing a text box where to insert the address.
2. The ***User*** provides the address to the ***System***.

*POST-CONDITION :*

The ***System*** computes an algorithm which takes in consideration the distribution of the cars in the city, the final destination of the ***User*** and the availability of power plugs in the ***Charging Area***. The result of this algorithm will be sent to the ***User*** providing him the address of the ***Charging Area*** where to leave the ***Car***.

(The ***User*** will still have to plug the ***Car*** in order to have a discount!)