* *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.*

**Flow of events**

1. The ***Visitor*** selects the function “Sign Up”.
2. 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.
3. The ***Visitor*** fill the forms with all the required information.
4. 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 this/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***

*4a 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.*

*4b 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.

**Flow of events**

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

**Post-Conditions**

The ***Visitor*** is now become the ***User*** which can access the ***System*** using the credentials (Email, password) he 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 .*

**Flow of events**

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

**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 User***’s dedicated functionalities.

**Alternative Flow of Events:**

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

* *USE CASE : Log out*

**Id**: UC4

**Description**

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

**Actors**

***User***

**Pre-Conditions**  
The ***User*** *is logged in the* ***System.***

**Flow of events**

1. The ***User*** selects the function “log out”.
2. The System performs the ***User***’s logout.

**Post-Condition**

The ***System*** shows the confirmation of the logout to the ***User***.

The ***User*** is now not able to use the ***System*** functionalities dedicated to ***Users*** anymore (until he logs in again).

* *USE CASE : Locate available cars.*

**Id**: UC5

**Description**

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

**Actors**

***User*.**

**Pre-Condition**

The ***User*** must be logged into the ***System****.*

**Flow of events**

1. The ***User*** selects the function “Locate Cars”.
2. 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*.
3. 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 5KM distance range from the given address.

**Alternative flow of events**

3a The ***User*** selects the function “Near me” instead of inserting a specific address.

4a 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 5KM distance range from the ***User’***s position.

4b The ***System*** does not find the inserted address and informs the ***User.*** The Flow of Events starts from point 1.

4c There are no available **Cars** in the specified address/***User’***s Position. The System informs the **User.** The Flow of Events start from point 1.

* *USE CASE : Reserve available car.*

**Id**: UC6

Description

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

Actors

***User***

**Pre-Condition**

The ***User*** must be logged into the ***System*** and the ***System*** must have found cars when the ***User*** activated the “Locate available cars” function***.***

Flow of events

1. The ***User*** chooses a specific ***Car*** between the showed ones in the map.
2. ***User*** selects the function “Reserve this Car”.
3. 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 : Unlock Car.*

*ID : UC9*

*DESCRIPTION : The* ***User*** *wants to ask the* **System** *to open the doors of the* **Car** *in order to enter it.*

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

*PRE-CONDITION : The* ***User*** *must be logged in the* ***System*** *and must have reserved a car.*

*FLOW OF EVENTS :*

1. The ***User*** activates the function “Unlock Car”.
2. The ***User*** sends his/her GPS coordinates to the ***System***;
3. The ***System*** checks that the GPS coordinates of the specific ***User*** ’s *Reserved* ***Car*** and the GPS coordinates of the ***User*** himself are in a 15 meters distance range.

*EXCEPTIONS :*

If one hour has passed since the reservation has been done and the ***User*** didn’t unlock the ***Car*** because he wasn’t in the 15 meters distance range or didn’t activate this function :

1. the reservation expires and the ***User*** cannot unlock the car anymore (unless with another reservation).
2. The ***System*** changes the ***Car*** status to Available.
3. The ***System*** communicates to the ***Banking System*** the amount of money (corresponding to the fee of 1 EUR) to charge to the ***User***.
4. The ***System*** now allows the ***User*** to perform another reservation.

*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.*

The ***User*** enters the ***Car.***

* *USE CASE : Drive Car.*

*ID : UC10*

DESCRIPTION : The ***User*** starts to drive the reserved ***Car***.

PARTECIPATING ACTORS : ***User***

PRE-CONDITION : The ***User*** has unlocked the doors of the car and entered the ***Car***.

FLOW OF EVENTS :

1. The ***User*** starts the engine of the ***Car*.**
2. The ***System***starts the Ride Timer which indicates the time usage of the ***Car***.
3. [Extension Point UC11].
4. [Extension Point UC14].
5. 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*** drives the ***Car***.

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

*ID : UC 11*

*DESCRIPTION : The* ***User*** picks up passengers to share the ride with.

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

*PRE-CONDITION :* The***User*** is driving his/her reserved ***Car.***

FLOW OF EVENTS :

1. The ***User*** picks up the desired passengers.
2. The ***Car*** detects the number of passengers.

*POST-CONDITION :*

The ***User*** is sharing the ride with his/her passengers.

The ***System*** stores the number of passengers in the ride and if they stayed in the ***Car*** for at least 3 minutes.

* *USE CASE : End ride.*

*Id : UC12*

*DESCRIPTION :* The***User*** ends the ride and the ***System*** processes the fee.

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

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

FLOW OF EVENTS :

1. The ***User*** exits the ***Car.***
2. The ***System*** verifies that no one is in the car.
3. The ***System*** checks the ***battery*** status***.***
4. The ***System*** checks, using the GPS coordinates, if the ***User*** has left the ***Car*** within a 3KM distance range from the nearest ***Charging Area***.
5. The ***System*** checks if the ***User*** drove with passengers, if they (UC11).
6. [Extension Point UC13].
7. The ***System*** communicates to the ***Banking System*** the final fee which will be charged to the ***User.***

*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.***

*ALTERNATIVE FLOW OF EVENTS:*

7a The battery status is higher than 50%, the ***User*** didn’t or did take at least 2 passengers with him for at least 3 minutes (UC11) , didn’t leave the ***Car*** at more than 3KM from the nearest ***Charging Area,*** didn’t plug the ***Car*** (UC13), hence the ***System*** applies a 20% discount on the fee of the last ride and communicates to the ***Banking System*** the fee which will be charged to the ***User***.

7b The ***User*** did plug the ***Car*** (UC13), the battery status is higher than or equal to 20%, he/she didn’t or did take at least 2 passengers with him for at least 3 minutes (UC11), hence the ***System*** applies a 30% discount on the fee of the last ride and communicates to the ***Banking System*** the fee which will be charged to the ***User***.

7c The ***User*** did plug the ***Car*** (UC13), the battery status is lower than 20%, he/she didn’t or did take at least 2 passengers with him for at least 3 minutes (UC11), didn’t plug the ***Car*** (UC13),hence the ***System*** doesn’t apply any discount or surcharge on the fee of the last ride and communicates to the ***Banking System*** the fee which will be charged to the ***User***.

7d The ***User*** didn’t plug the ***Car*** (UC13), the battery status is higher than 50%, he/she did or didn’t take at least 2 passengers with him for at least 3 minutes (UC11), did leave the ***Car*** at more than 3KM from the nearest ***Charging Area,***hence the ***System*** applies a 10% surcharge on the fee of the last ride and communicates to the ***Banking System*** the fee which will be charged to the ***User***.

7e The battery status is between 20% and 50% (included), the ***User*** did take at least 2 passengers with him for at least 3 minutes (UC11) , didn’t leave the ***Car*** at more than 3KM from the nearest ***Charging Area,***didn’t plug the ***Car*** (UC13), hence the ***System*** applies a 10% discount on the fee of the last ride and communicates to the ***Banking System*** the fee which will be charged to the ***User***.

7f The battery status is lower than 20%, the ***User*** did take at least 2 passengers with him for at least 3 minutes (UC11) , did or didn’t leave the ***Car*** at more than 3KM from the nearest ***Charging Area,***didn’t plug the ***Car*** (UC13), hence the ***System*** applies a 20% surcharge on the fee of the last ride and communicates to the ***Banking System*** the fee which will be charged to the ***User***.

7g The battery status is between 20% and 50% (included), the ***User*** did take at least 2 passengers with him for at least 3 minutes (UC11) , did leave the ***Car*** at more than 3KM from the nearest ***Charging Area,*** hence the ***System*** applies a 20% surcharge on the fee of the last ride and communicates to the ***Banking System*** the fee which will be charged to the ***User***.

7h The battery status is lower than 20%, the ***User*** didn’t take at least 2 passengers with him for at least 3 minutes (UC11) , did or didn’t leave the ***Car*** at more than 3KM from the nearest ***Charging Area,***didn’t plug the ***Car*** (UC13), hence the ***System*** applies a 30 % surcharge on the fee of the last ride and communicates to the ***Banking System*** the fee which will be charged to the ***User***.

7j The battery status is higher than 50%, the ***User*** did or didn’t take at least 2 passengers with him for at least 3 minutes (UC11) , did leave the ***Car*** at more than 3KM from the nearest ***Charging Area,***didn’t plug the ***Car*** (UC13), hence the ***System*** applies a 10 % surcharge on the fee of the last ride and communicates to the ***Banking System*** the fee which will be charged to the ***User***.

7k The battery status is between 20% and 50% (included), the ***User*** didn’t take at least 2 passengers with him for at least 3 minutes (UC11) , did leave the ***Car*** at more than 3KM from the nearest ***Charging Area,*** hence the ***System*** applies a 30% surcharge on the fee of the last ride and communicates to the ***Banking System*** the fee which will be charged to the ***User***.

*EXCEPTIONS :*

The Ride ends and the ***Car*** stops moving when the battery status reaches 0% of the full capacity or when the ***Car*** detects a major damage which denies the ability to drive it.

* *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.***

FLOW OF EVENTS :

1. The ***User*** plugs the ***Car*** into the socket of the ***Charging Area***.
2. The ***System*** detects that the ***Car*** is plugged within 2 minutes since the ***User*** got off the Car.

*POST-CONDITION :*

The ***System*** stores that the ***User*** will have a minimum discount of 10% on the fee of his/her 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!)

EXCEPTIONS :

If the Socket of the ***Charging Area*** has no more available plugs , the ***System*** informs the ***User*** and the Flow of Events starts from point 1.