PowerEnjoy Project

RASD presentation

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Goals

The driver can

- Register/log into the system
- Locate available cars within a distance around a position
- Reserve a car for up to 1hour
- Unlock a reserved car if he is close enough and pick it up
- Enable the saving money option and give his destination

The system should

- Start charging once the car ignites
- Stop charging once the car is parked in a safe area
- Apply discounts/charges according to the driver's ride
- Provide a power grid station to the driver selecting the saving money option
- Inform the driver of the cost in real time
- Provide the price of the ride at the end

Constraints

- Ensure safety of driver details and transactions
- The car position can be known at anytime, anywhere
- The system is compliant with local laws about drivers' details
- The system can work with most of online mean of payment

Assumptions

The driver

- Has a driver license, piece of identity, mean of payment, smartphone with localization system
- Is legally responsible for his actions
- Will ignite the engine after unlock it
- Provides reliable details

The system

- Can communicates with the car at anytime, anywhere (knows its position…)
- Can only be accessed by the smartphone application
- Knows the position of safe areas, special parking areas and power grid stations

The car

- Can count the passengers number
- Provides an interface to communicate with the driver
- Is set to unavailable by the maintenance service when it is damaged

The company

- Has a maintenance and insurance service for cars
- Provides a sufficient amount of safe areas/power grid stations to cover the city

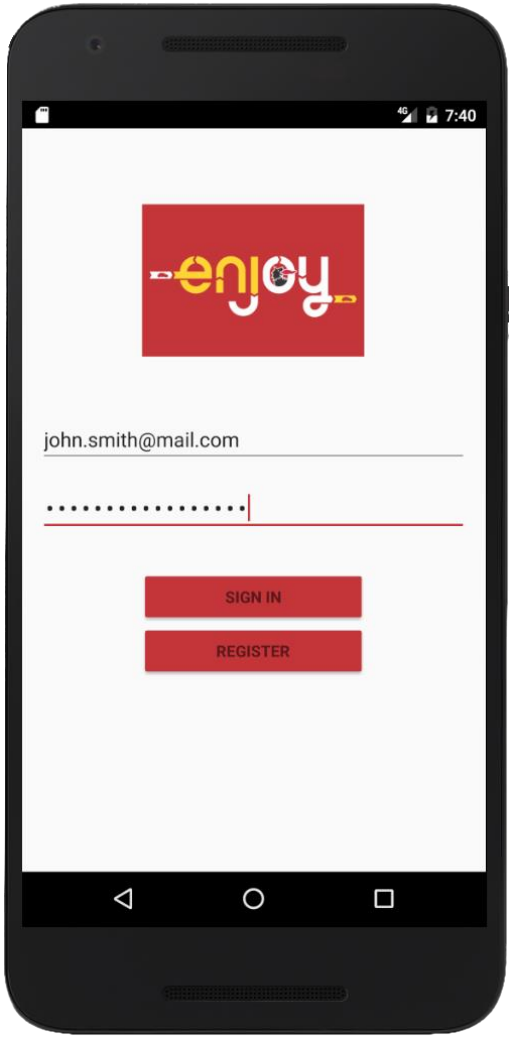
Requirements Analysis

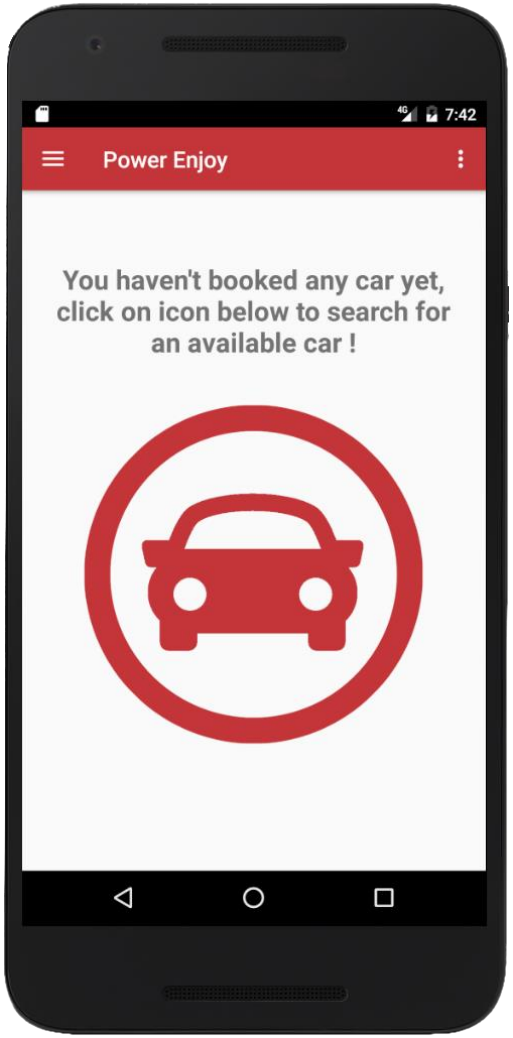
- Management of driver's details and access
- Security/Confidentiality for registration, log in and payment
- Management of car and drivers status
- Management of reservation and reservation fee's
- Management of car's access for the driver
- Management of the different areas in the system
- Management of ride and eventually discounts
- Management of car's battery level
- Communication with car

Requirements Analysis

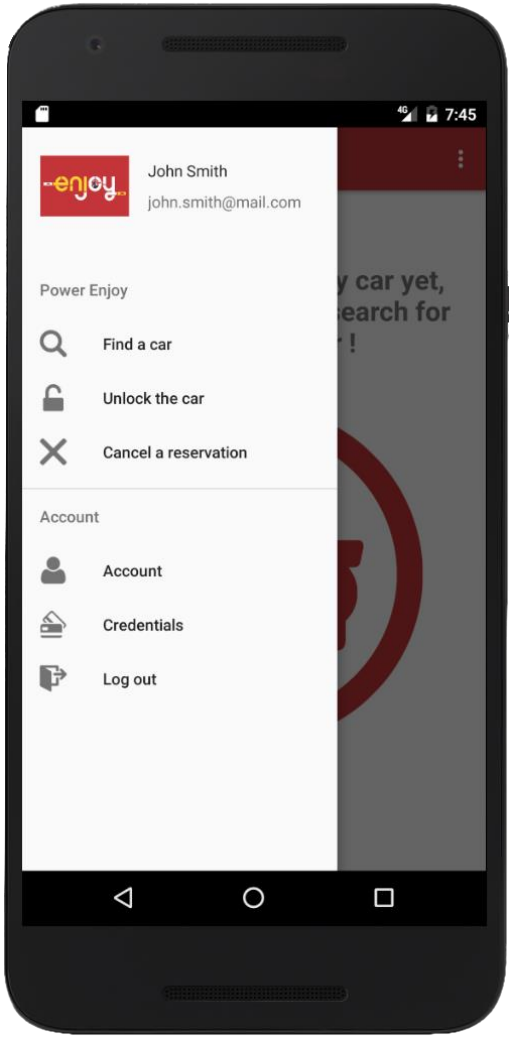
- Algorithm to provide available cars to drivers
- Algorithm to provide destination mixing distributions of cars and drivers' final destinations

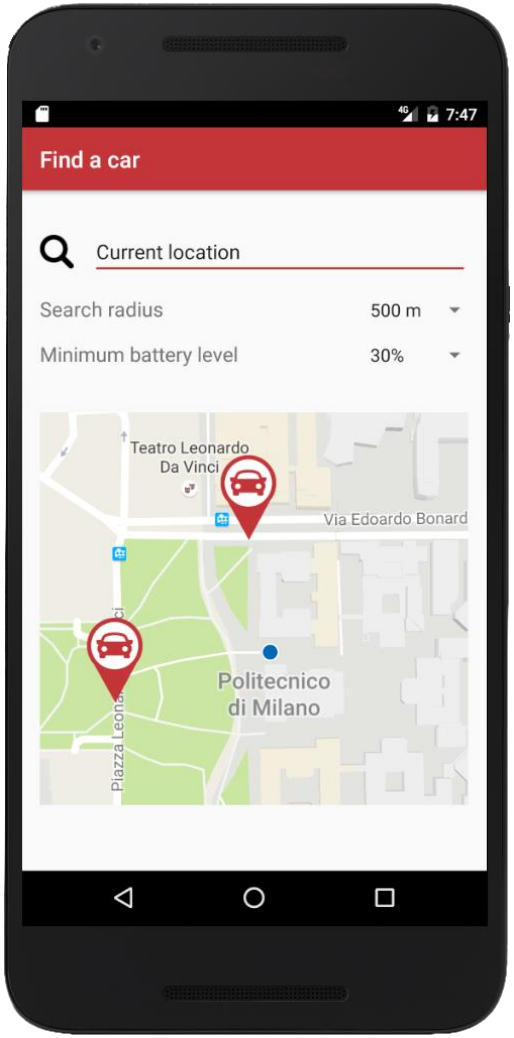
Requirements Analysis



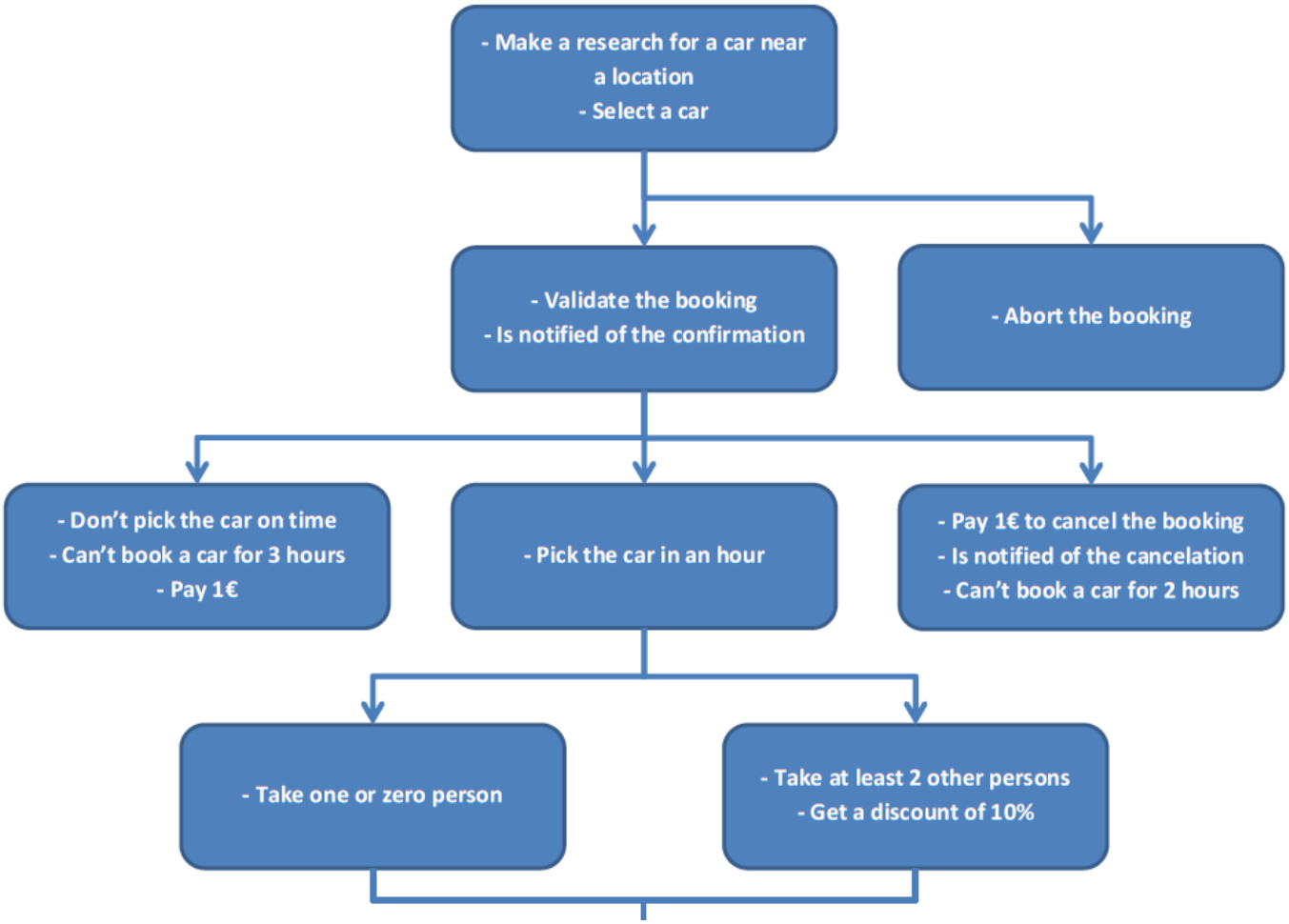


Requirements Analysis

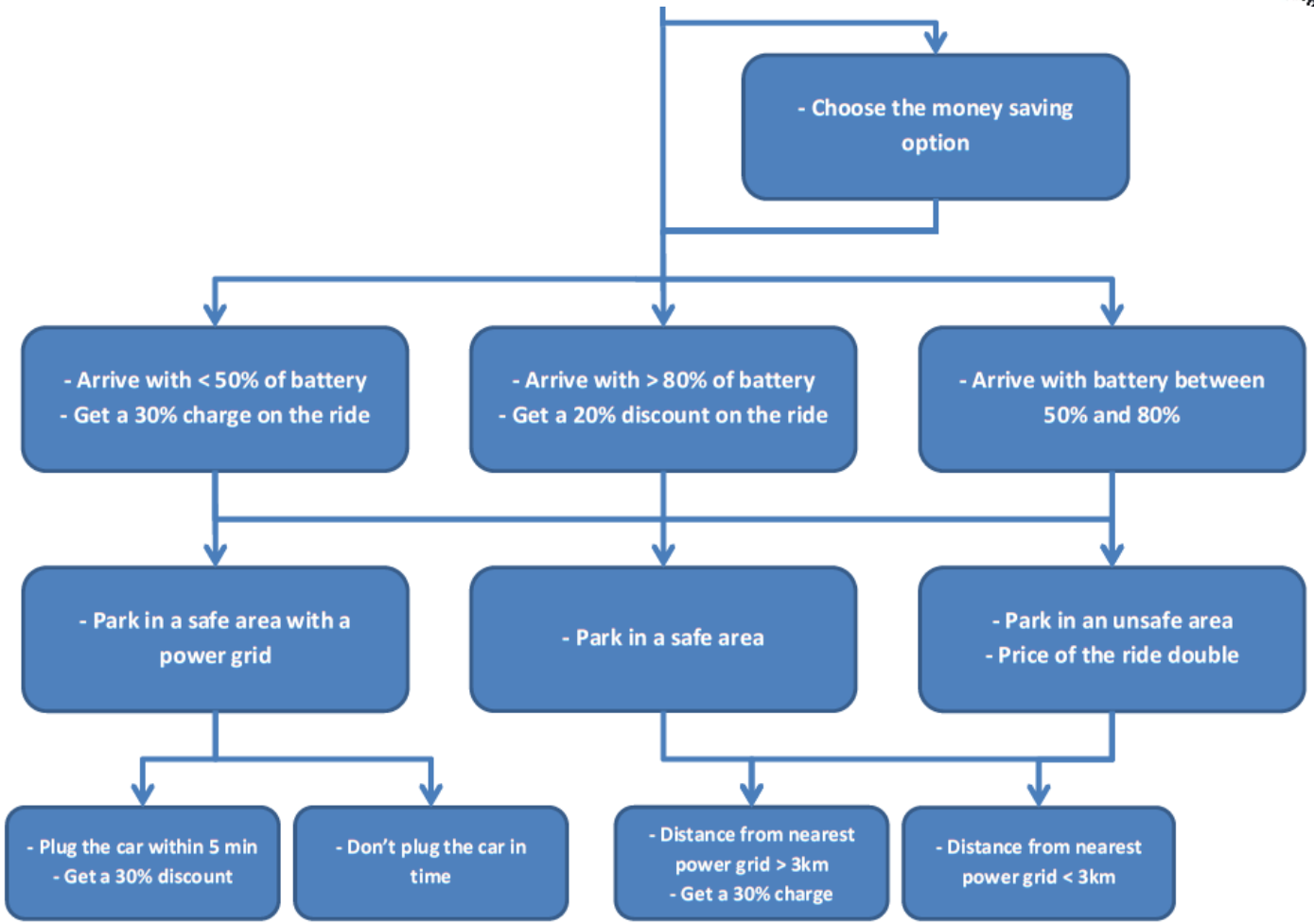




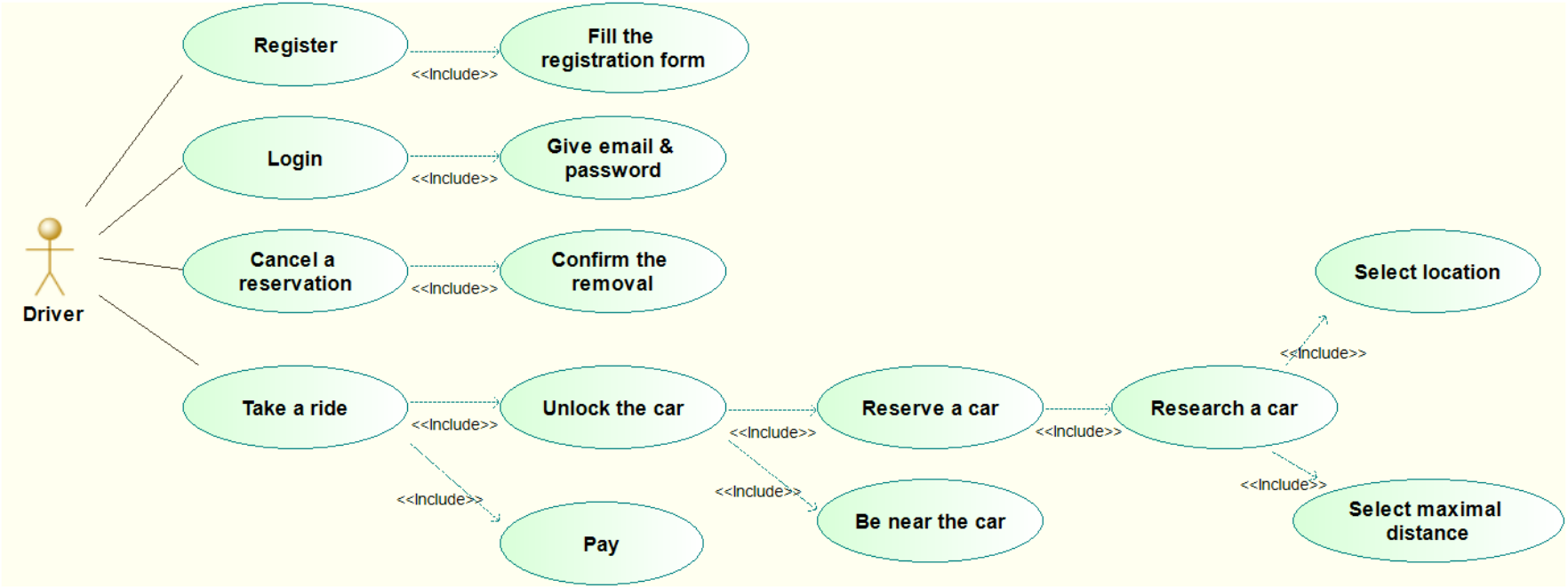
Scenarios


- Make a research for a car near a location
- Select a car
- Validate the booking
- Is notified of the confirmation
- Abort the booking
- Don't pick the car on time
- Can't book a car for 3 hours
- Pay 1€
- Pick the car in an hour
- Pay 1€ to cancel the booking
- Is notified of the cancelation
- Can't book a car for 2 hours
- Take one or zero person
- Take at least 2 other persons
- Get a discount of 10%

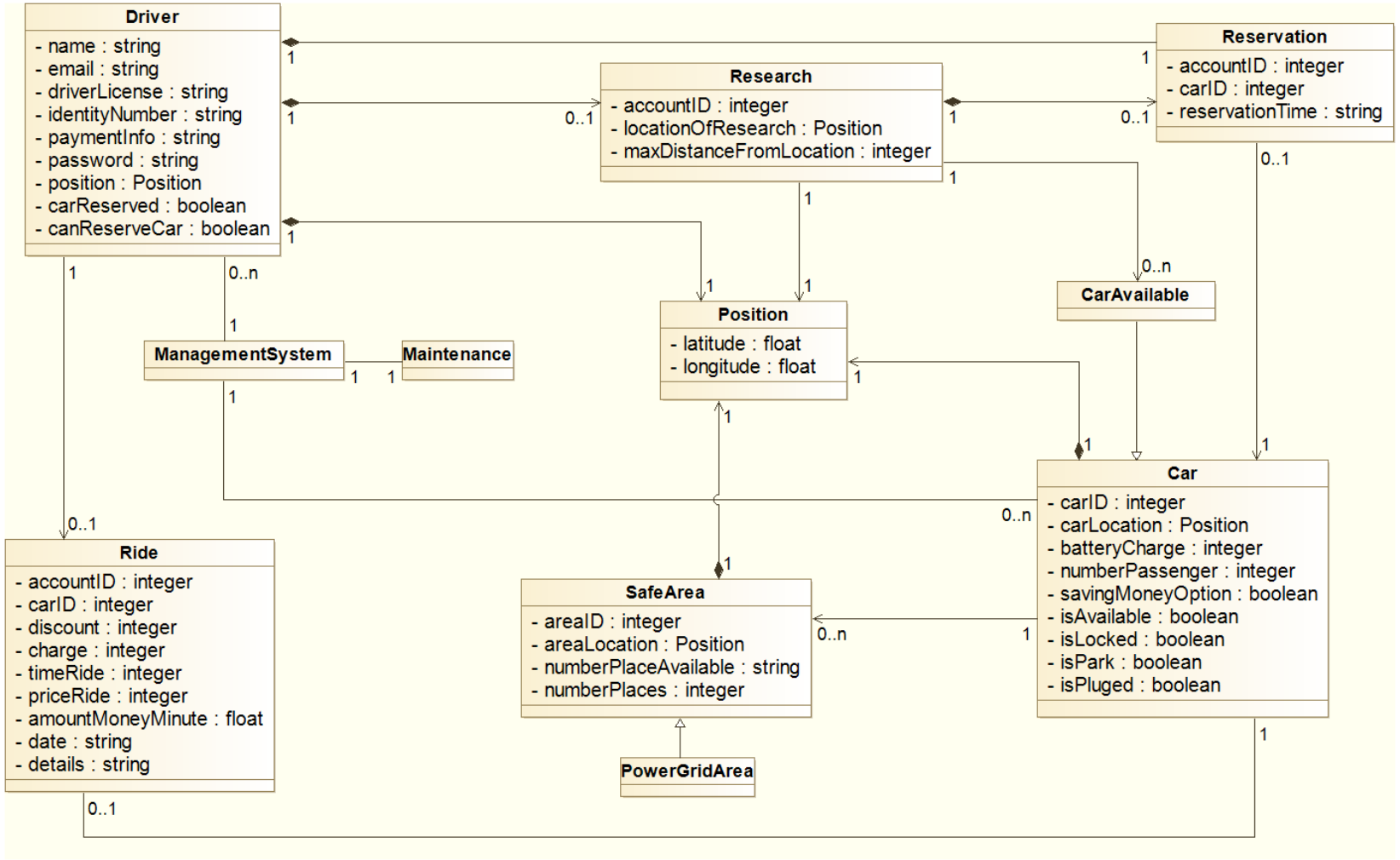
Scenarios


- Choose the money saving option
- Arrive with < 50% of battery
- Get a 30% charge on the ride
- Arrive with > 80% of battery
- Get a 20% discount on the ride
- Arrive with battery between 50% and 80%
- Park in a safe area with a power grid
- Park in a safe area
- Park in an unsafe area
- Price of the ride double
- Plug the car within 5 min
- Get a 30% discount
- Don't plug the car in time
- Distance from nearest power grid > 3km
- Get a 30% charge
- Distance from nearest power grid < 3km

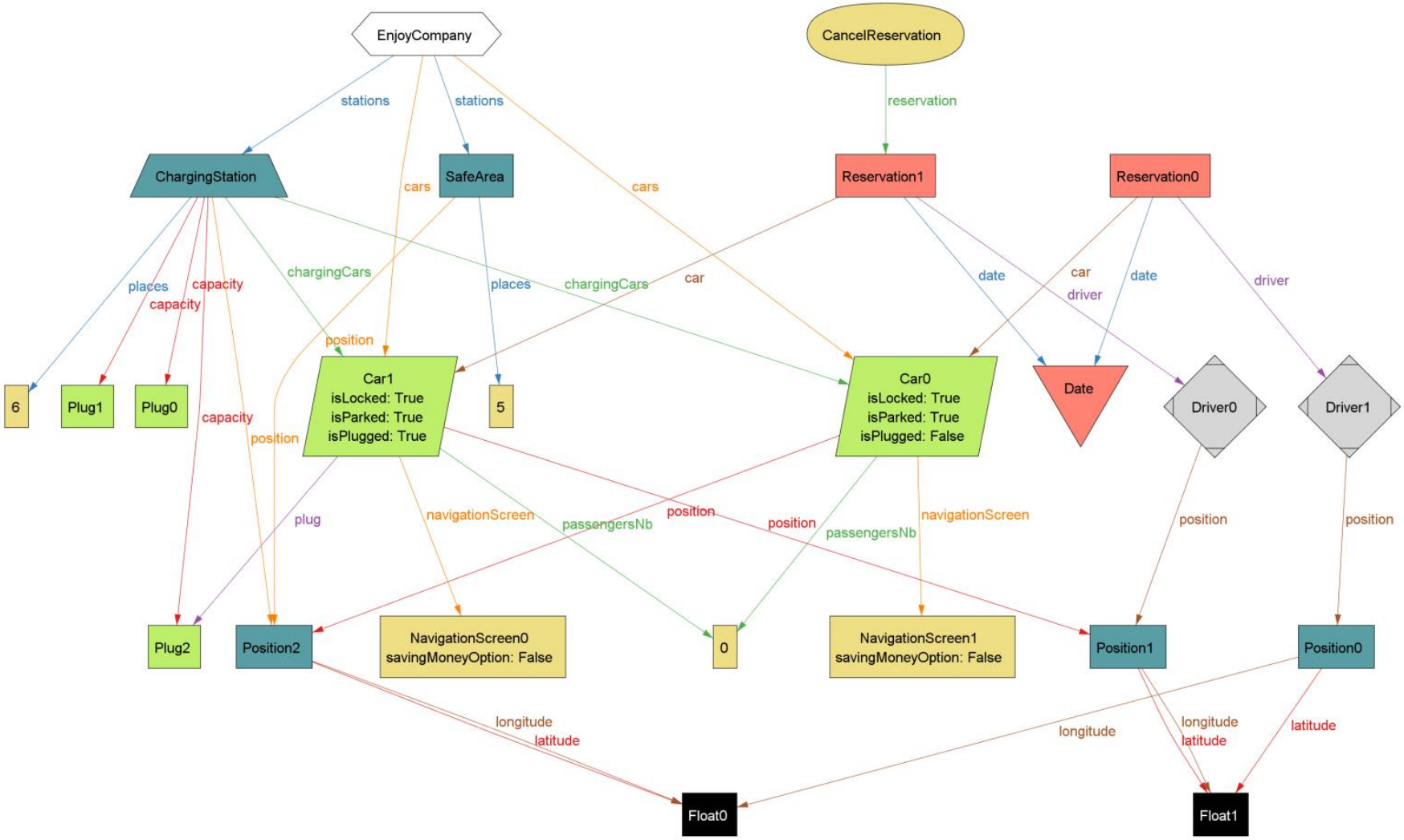
Use Cases


Register
Fill the registration form
<<Include>>
Login
Give email & password
<<Include>>
Cancel a reservation
Confirm the removal
<<Include>>
Driver
Take a ride
<<Include>>
Unlock the car
<<Include>>
Reserve a car
<<Include>>
Research a car
<<Include>>
Select location
<<Include>>
<<Include>>
Pay
<<Include>>
Be near the car
<<Include>>
Select maximal distance

Class Diagram *(simplified)*



Alloy Model


EnjoyCompany
CancelReservation
stations
stations
reservation
ChargingStation
SafeArea
Reservation1
Reservation0
cars
cars
places
capacity
capacity
chargingCars
places
chargingCars
car
date
car
driver
date
driver
position
6
Plug1
Plug0
capacity
position
Car1
isLocked: True
isParked: True
isPlugged: True
5
Car0
isLocked: True
isParked: True
isPlugged: False
Date
Driver0
Driver1
plug
navigationScreen
passengersNb
position
position
passengersNb
navigationScreen
position
position
Plug2
Position2
NavigationScreen0
savingMoneyOption: False
0
NavigationScreen1
savingMoneyOption: False
Position1
Position0
longitude
latitude
longitude
longitude
latitude
latitude
Float0
Float1

Thank you