Laboratory 02

Carsharing – Part1

Introduction

Introduction

Carsharing is a feature that some cars have and that allows the owner, whether he is an individual or a company, to rent his car. The benefit compared to the classic rental is that there is no need for physical contact between the owner and the person renting the car.
To make remote rental possible, Carsharing is based on communication and the exchange of messages between multiple entities:

- a phone applications which allows clients to request a car and owners to give their car for rental.
- car manufacturer backend
- the car itself through the telematics module.

Before we continue, please watch this video for a brief introduction :

https://www.youtube.com/watch?v=YJZrSKNkgMU&ab_channel=SHARENOW

https://www.youtube.com/watch?v=Q8EvQrKwjxY

Note: Videos are only for didactic purposes. No advertising intended.

Tasks

Exercise 1 – no coding

On paper create the scheme of a system to manage carsharing operations. The system will have three main entities: mobile application, producer backend and the car itself. You can use a diagram, plain text or both. The following aspects should emerge from the scheme regarding the three entities.

- Who is the client and who is the server? (0.5 point)
- Who communicates with whom? (0.5 point)
- What is the scope of each of the three components of the system? (1 point)
- What are the messages that the three entities need to exchange among themselves in order to achieve the desired functionality? (1 point)

Exercise 2

Implement the previously defined communication so that the server and the clients involved in the carsharing process only use messages that respect a well-defined structure.

- The receiver/sender and the purpose of each possible message is clearly defined and explained by a team member. (1 point)

- Client and Server are able to identify what type of message is received and print a specific log for each message (1 point). Client and Server only accept messages that are compliant with the defined structure. Otherwise invalid message error log will be printed. (1 point)

Example message between phone app and backend

Client Id	Client Type	Message Id	Payload

Client Id : unique identifier of client

Client Type :

0 – Owner

1 – Renter

Message Id:

0 – register Renter

1 – register Owner

2 – post Car

3 – request Car

4 – startRental

5 – endRental

Payload : other data thay may be neccesary