**Project**

The target of the project is to create an application for renting cars according to the location that you previously specified.

**Actors**

There are two types of users: the one who rent his car to others and the one who rent the car from others.

The first user can rent his car for a fixed time (chosen by himself) to others; vice versa, the second one can look for a specific car from a search bar, that allows also to filter it by some characteristics, and choose the one he prefers (for example, the one whose price is the lowest or an electric car rather than the one with internal combustion engine).

Every user can register to one or more zones and then, he will receive every advertisement that is published by others that are subscribed to the same zone; he can also filter the car’s type or brand (the same filters that are used in the search bar).

Furthermore, if a user rents a car for a fixed time, he will receive a notification a few minutes before the expiration time and he will be prompted for the extension of the rental period (if it is allowed by the renter); if he accepts, the cost of his rental will be updated, and he will receive another notification a few minutes before the updated expiration time.

**What the system should do**

There is also a part of the system that allows the exchange of messages between the user that are involved in a negotiation.

There can be two types of notifications: a message that notifies about the addition of a new car in a specific zone or the availability of a car that was previously busy.

Every person that rents a car can provide feedback on the application about the renter’s behavior or the renter’s car conditions.

**System**

The system is based on the Publish-Subscribe pattern to provide notifications and the Request-Reply pattern for the search bar. When a user register to the application, he automatically sends its IP address to the server that is in charge of storing the IP addresses of the users registered in that zone. This is necessary for the intrinsic nature of the application, Peer-To-Peer. Every user is a peer and, every time he wants to search or rent a car, he requests from the centralized server for all the IP addresses of the area and then he can start to interact with all the peers whose IP addresses he received. Higher is the number of users that rent their car, wider is the choice among them; this improves the user experience.

**Dissimilarities with other applications**

The application is inspired by Airbnb for the messaging system, by Uber for the concept of the transport service and by Enjoy for the rental service. It mixes some aspects of each one, but it is a completely different application: it differs from Uber for the fact that you are more independent both in the choice of the car and the route you want to travel; it also differs from Enjoy for the fact that you can choose your preferred car according to your own parameters (not the standard ones); finally, it differs from Airbnb for the fact that its domain is different.

Because of the nature of the application, the potential number of cars is infinite, and this provides a better user experience other than a wider selection of cars among which a single user can choose; this can lead to competitive actions inside the application.