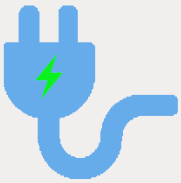

“Easy Charge”

Software requirement specification

February 11, 2023 | Version 1.2

Simone Bucci, Miriana Marchi

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INTRODUCTION

Aim of the document

The aim of this document is to present a description of “EasyCharge“. It will present the purpose and features of the system and what the system will do.

Overview of the defined system

This application is a tool that helps users locate charging stations for electric vehicles. With its user-friendly interface and mapping technology, users can easily find charging stations near their current location. The app provides key information such as availability and station type, allowing users to choose the best option for their needs. Additionally, businesses have the opportunity to advertise their products and services in the vicinity of a selected charging station, increasing visibility and attracting new customers. It also allows users to save their favorite charging stations and get directions to them. With this application, finding a charging station for your electric vehicle and discovering new businesses has never been easier.

Operational settings

“EasyCharge” should run on any Operating System that supports the Java Environment (version 8 or higher).

Related systems

Comparison between EasyCharge and Google Maps:
Pros of EasyCharge:

- Specialized focus on charging stations, providing more comprehensive and relevant information compared to general mapping services like Google Maps.
- Allows businesses to advertise in the vicinity of a selected charging station, potentially attracting new customers.
- User-friendly interface specifically designed for finding charging stations.

Cons of EasyCharge:

- Limited to electric vehicle charging stations, lacking the broader mapping and navigation features of Google Maps.
- May not have as many users or updated information as Google Maps, potentially leading to incorrect or outdated information.

Pros of Google Maps:

- Widely used and established with a large user base, leading to more accurate and up-to-date information.
- Offers a comprehensive mapping and navigation experience, including features such as traffic updates, public transportation information, and detailed street-level imagery.
- Integrates with other Google services, such as Google Search and Google Maps.

Cons of Google Maps:

- Not specifically designed for finding charging stations, leading to less comprehensive information and a less user-friendly experience for electric vehicle owners.
- No option for businesses to advertise in the vicinity of charging stations.
- Pros of Enel X Way:
- Established service with a wide network of charging stations, leading to more accurate and up-to-date information.

- Offers a range of services beyond just charging stations, including energy management solutions and electric vehicle services.

Cons of Enel X Way:

- May have a less user-friendly interface compared to a specialized charging station locator app.
- May not offer the same level of customization and advertising opportunities as a smaller, specialized app.

EasyCharge, Enel X Way and Google Maps have their strengths and weaknesses, and the best option for a user may depend on their individual needs and preferences.

USER STORIES

Bucci

As a user, I want to know where the charging stations are in a chosen range, so that I can recharge my car in case of emergency.

As a business user, I want to advertise my business to charging stations of my choice, so that I can increase the number of my customers.

As a user, I want a list of which operator provides the recharge and the cost in kW/h, so that I can choose the cheapest operator.

Marchi

As a registered user, I want to know which charging stations are on my route, so that I can optimize my time during the stops.

As a user, I want to be notified if the charging station is busy, so I can reach the first available station and avoid queues.

As a user, I want to be notified of any out of order or inability to recharge, so that I can save time and car's charge.

FUNCTIONAL REQUIREMENTS

Bucci

The system shall advertise registered merchants' business to the selected charging stations.

The system shall display in a map the charging stations within a specified range.

The system shall provide a list of the charging services operators and the related costs in kW/h.

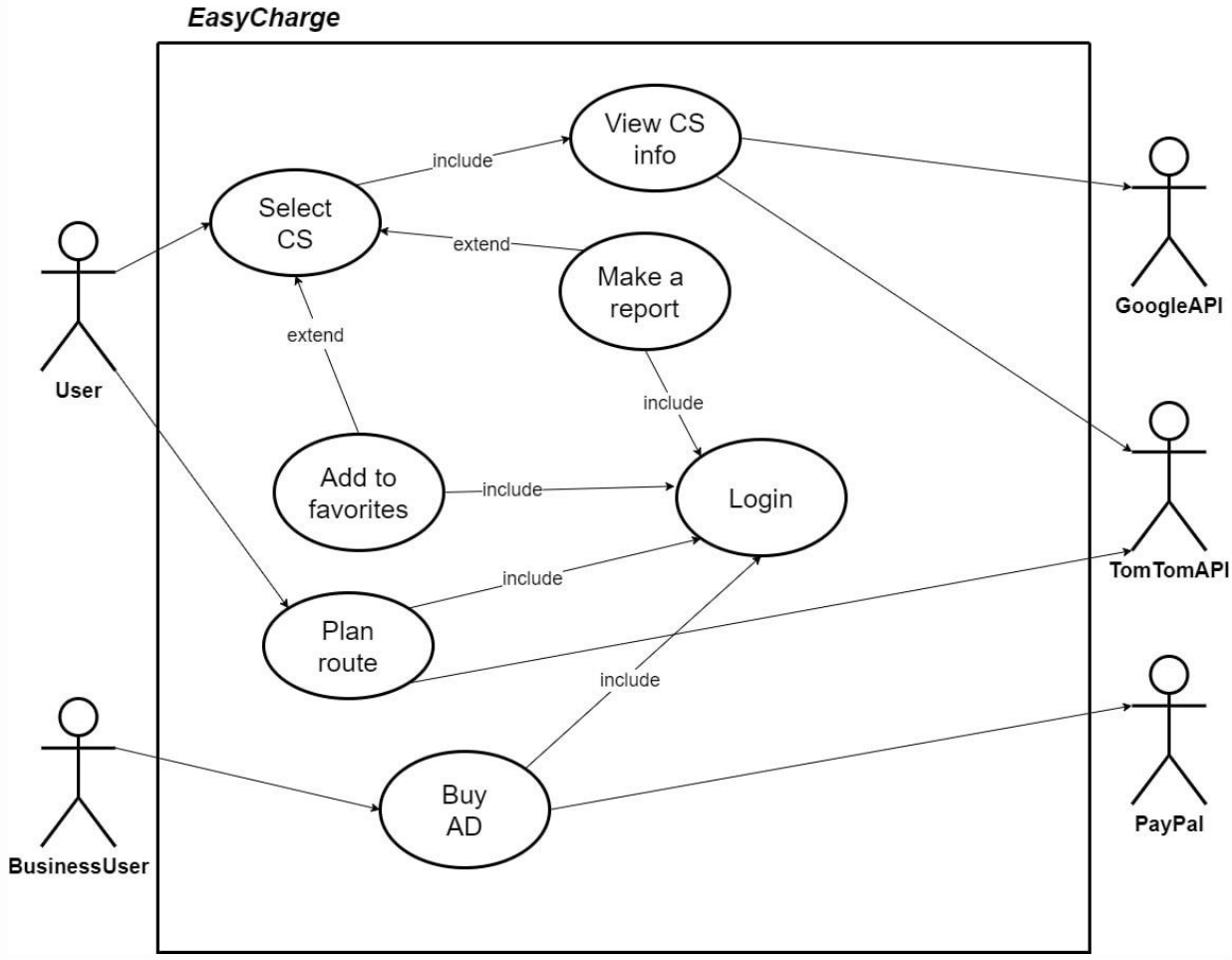
Marchi

The system shall provide the charging stations along a chosen route.

The system shall provide commercial activities in a chosen range from the charging station selected by the user.

The system shall report out of service charging stations.

USE CASE DIAGRAM



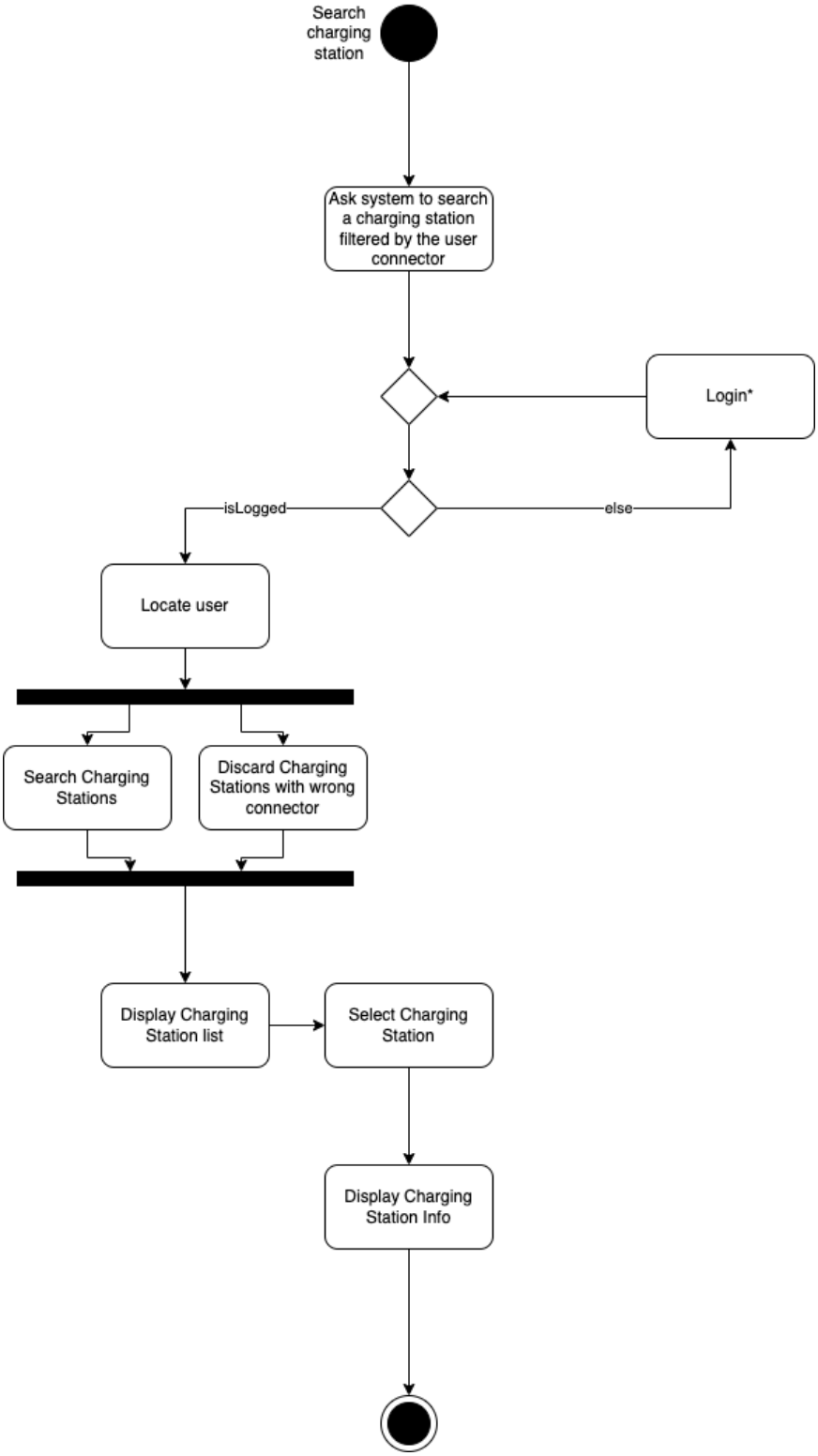
STORYBOARD

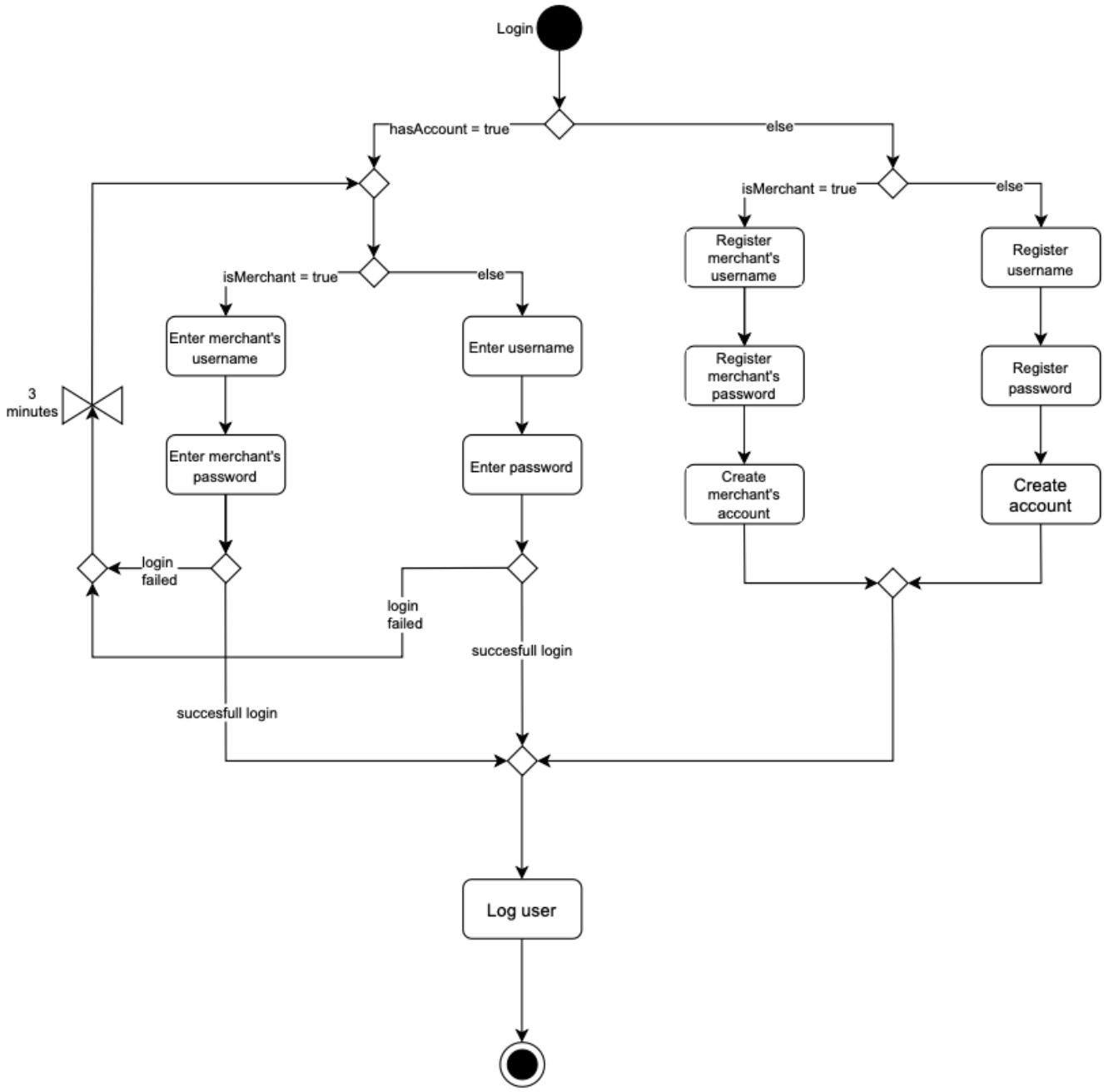
Repo: https://github.com/simonebucci/EasyCharge-Documentation/blob/main/Storyboard/Storyboard.html

Preview:https://htmlpreview.github.io/?https://github.com/simonebucci/EasyCharge-Documentation/blob/main/Storyboard/Storyboard.html

ACTIVITY DIAGRAM

Bucci




Login
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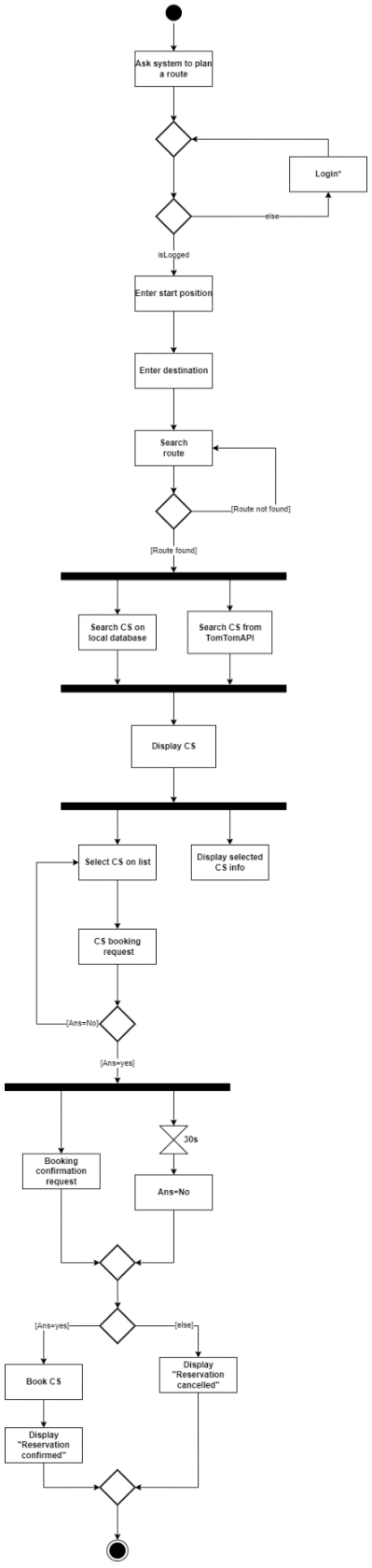
else
isMerchant = true
else
isMerchant = true
else
Register merchant's username
Register username
Enter merchant's username
Enter username
Register merchant's password
Register password
3 minutes
Enter merchant's password
Enter password
Create merchant's account
Create account
login failed
login failed
succesfull login
succesfull login
Log user

Marchi


Ask system to plan a route
Login*
else
isLogged
Enter start position
Enter destination
Search route
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[Route found]
Search CS on local database
Search CS from TomTomAPI
Display CS
Select CS on list
Display selected CS info
CS booking request
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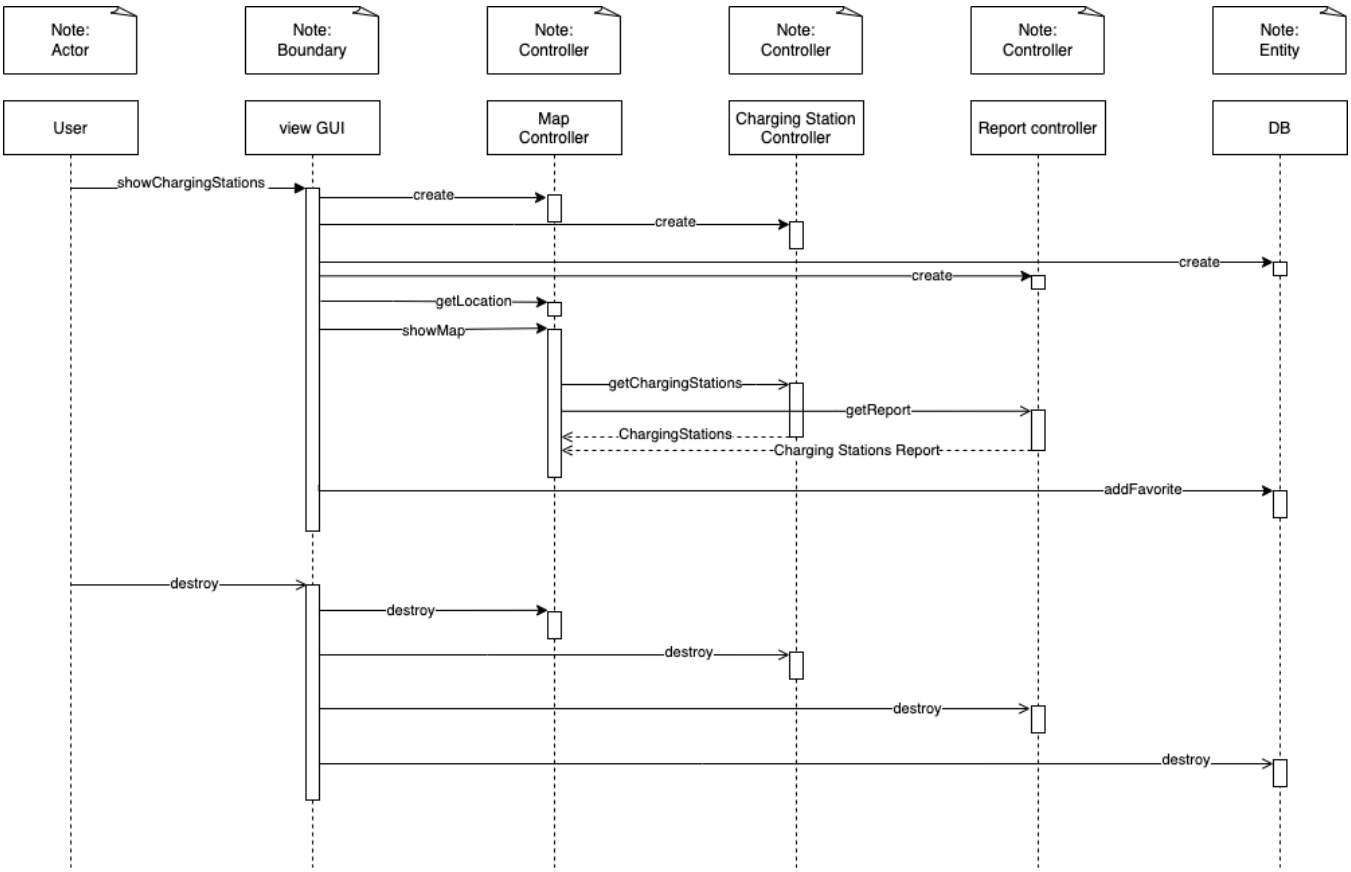
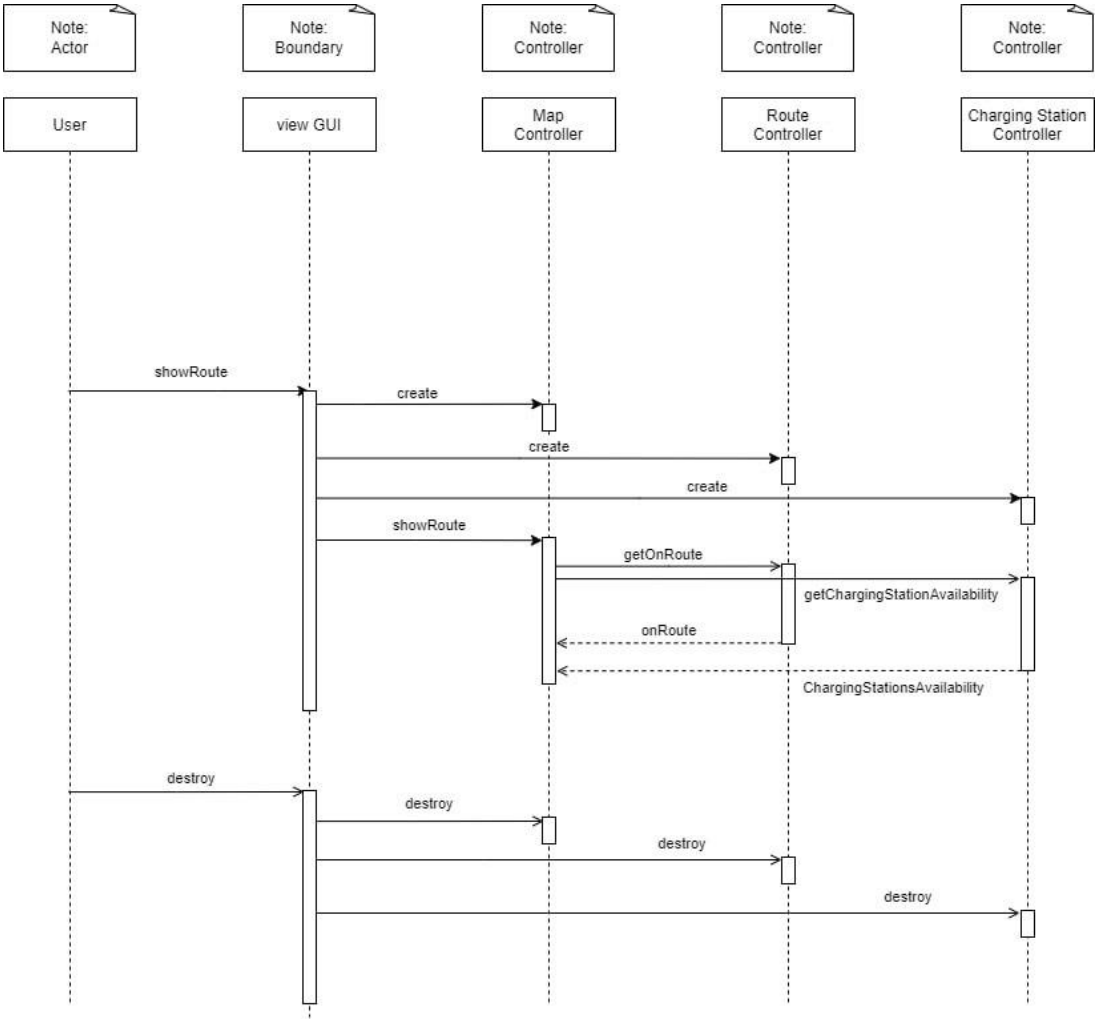
[Ans=yes]
30s
Booking confirmation request
Ans=No
[Ans=yes]
[else]
Book CS
Display "Reservation cancelled"
Display "Reservation confirmed"

SEQUENCE DIAGRAM

Bucci

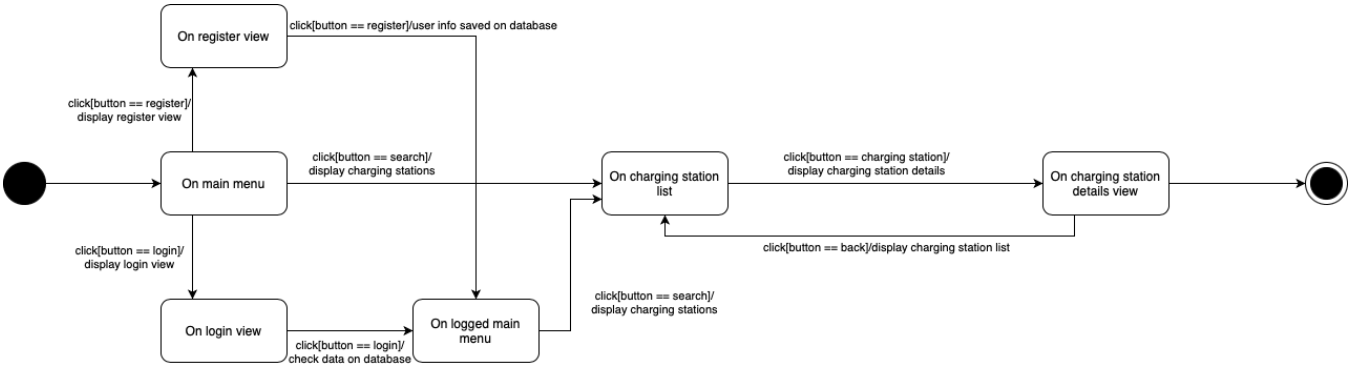


Marchi



STATE DIAGRAM

Bucci



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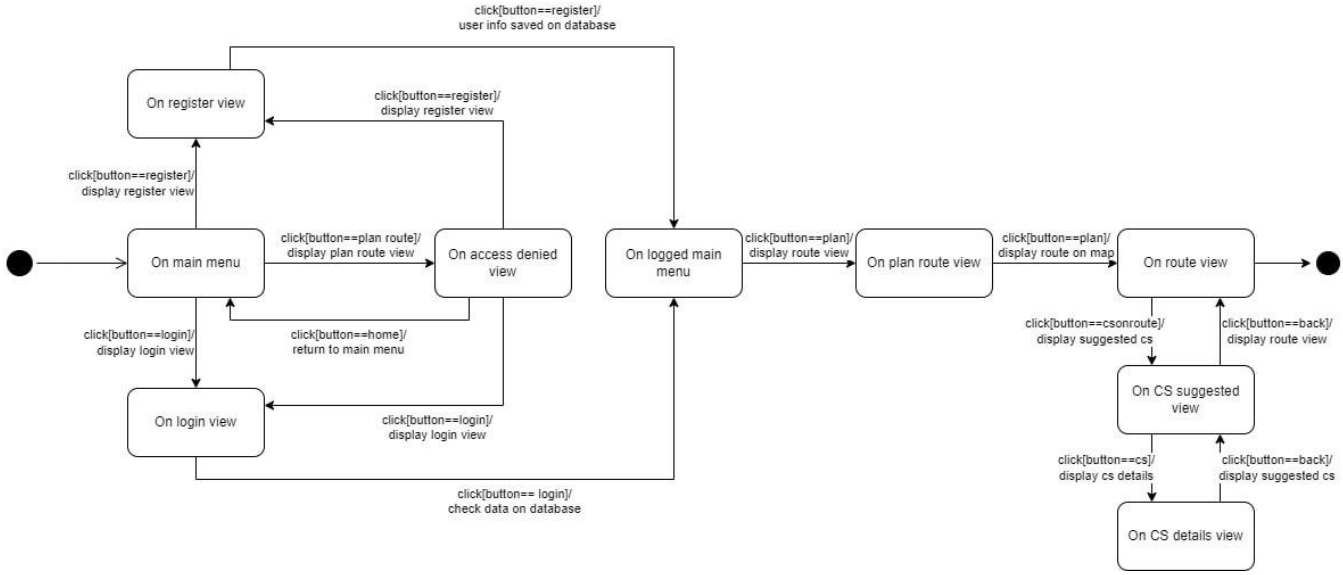
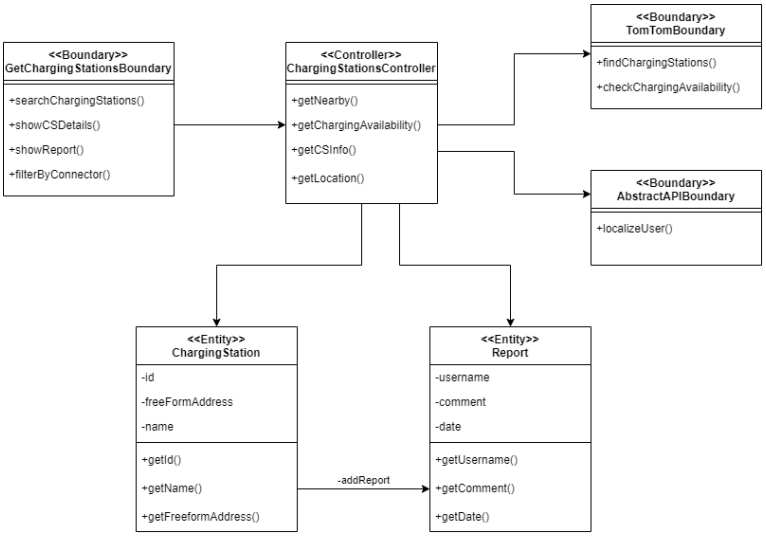
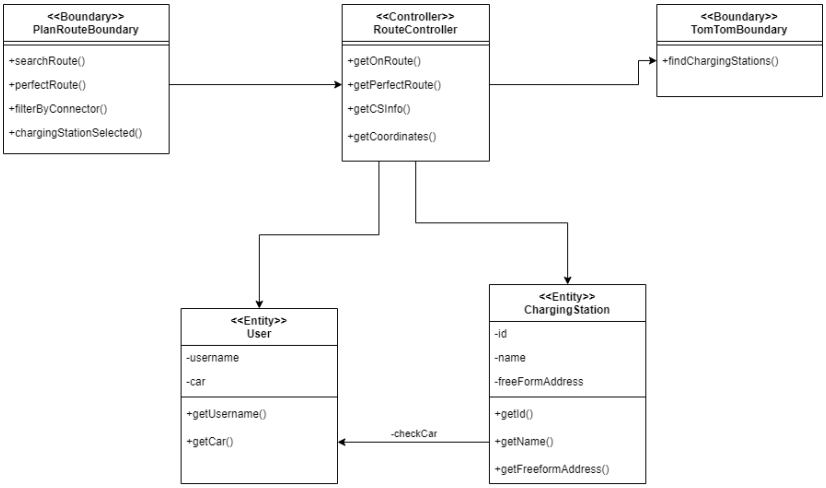


BCE

Bucci



Marchi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+perfectRoute()
+filterByConnector()
+chargingStationSelected()
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+getOnRoute()
+getPerfectRoute()
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+getCoordinates()
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+findChargingStations()
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-car
+getUsername()
+getCar()
-checkCar
<<Entity>>
ChargingStation
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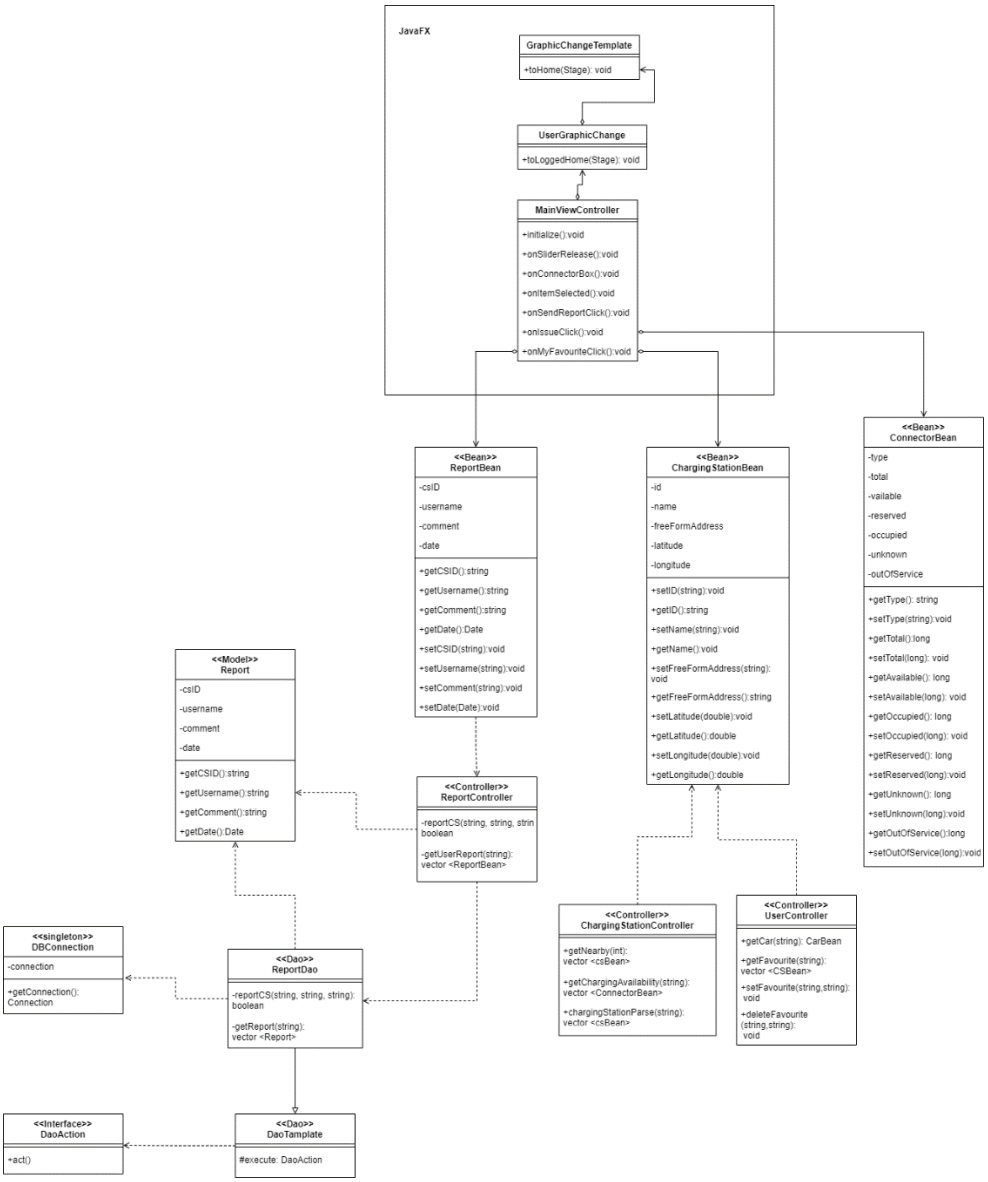
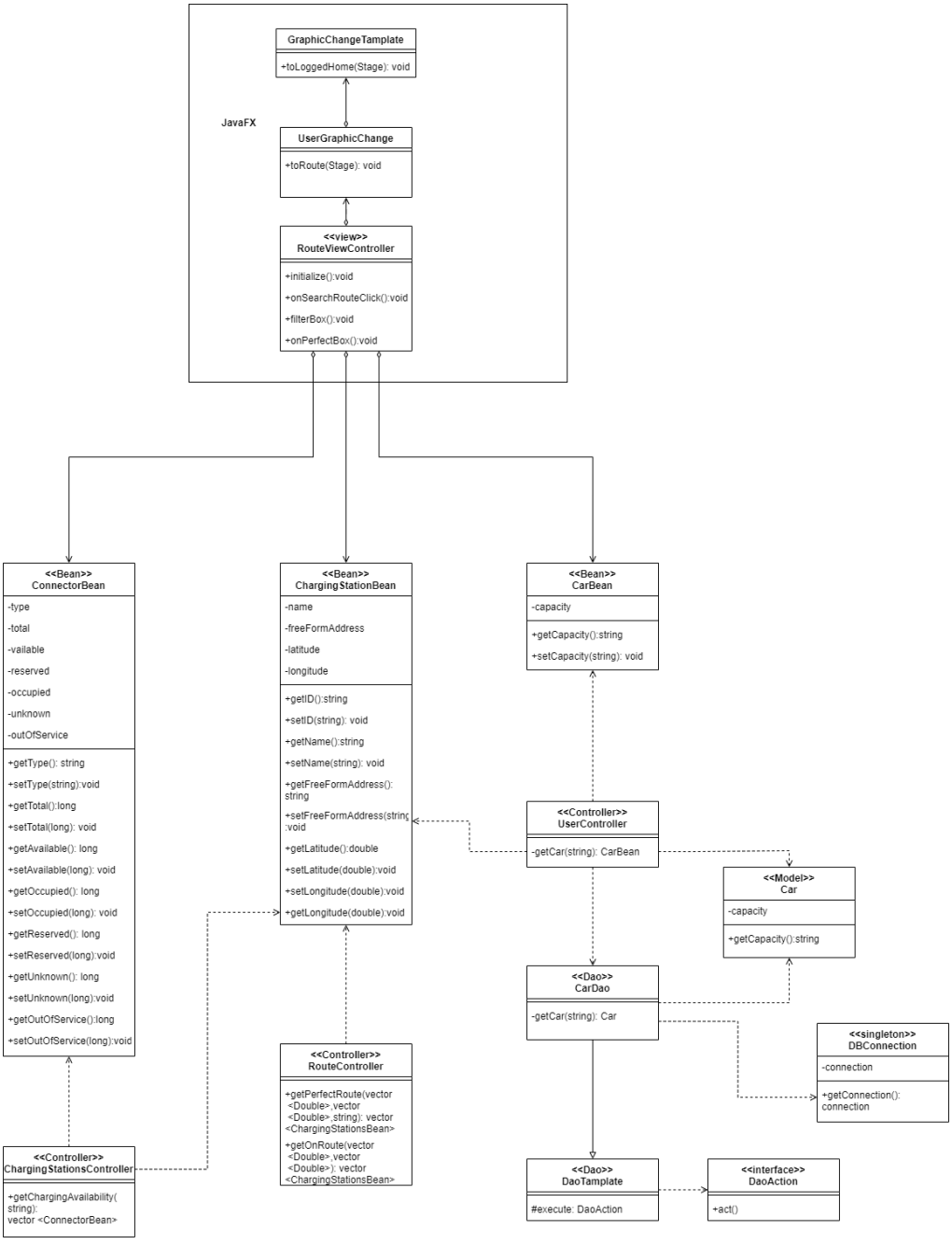
-name
-freeFormAddress
+getId()
+getName()
+getFreeformAddress()

CLASS DIAGRAM

Bucci



Marchi



SONARCLOUD

https://sonarcloud.io/project/overview?id=simonebucci_easycharge

GITHUB REPOSITORY

https://github.com/simonebucci/easycharge