IT solution for Bus Reservation System

1. User requirements:

1. IT system to handle ticket sales and booking.
2. The system has two types of users: Customers and Employees
3. Customer can take part in a loyalty program. If he had more than 15 rides during the 3 months, he will have 10% discount and 20% discount if he had 25 rides. Customer can also share promo-code which will be given to him, and for each 5^{th} ride with his promo-code he will have a free ride.
4. Employees can also book and buy tickets for themselves and up to 4 tickets per month will be with 20% discount.
5. The bus has multiple types. Each type is described by name and comfortability (wifi, gadgets, chargers etc). Each bus described by its type and number of seats and number of floors.
6. Each bus can have up to 2 drivers and 1 stewardess.
7. Each travel described by starting point, destination point, and total ride time.
8. Tickets are described by number of bus, its type, starting point, names of each stops, destination point and price.
9. There can be discount for tickets for customers who are students, but the discount cannot be higher than 30%. Also, price for the ticket may drop by time, but it cannot be higher than 50%.
10. For each prepared displaying we store information about bus number and its type, date of travel, departure time, arrival time and normal ticket price. The places which are booked or sold already

will be showed, whether the ticket is normal price or discount. For each booked place surname and id of person will be stored.

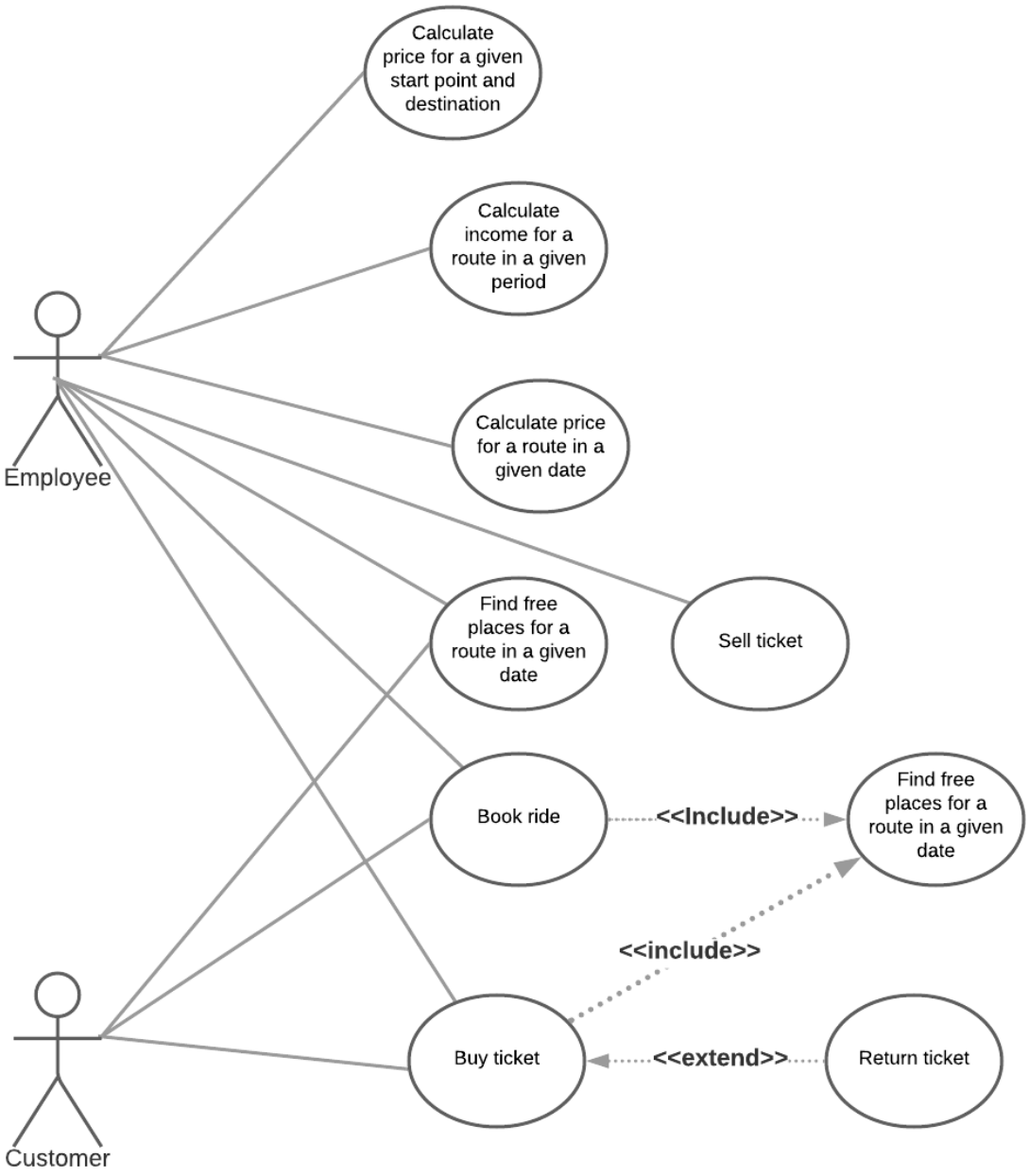
11. **System should help the employers with:**

    1) Calculating the price for a given start point and destination point.
    2) Calculating the income from tickets for a given start point and destination point for a given date.
    3) Finding free places for a given start point and destination point for the given period time.
    4) Booking tickets
    5) Selling tickets
    6) Returning tickets
    7) Cancelling rides
    8) Posting new rides
    9) Cancelling displaying

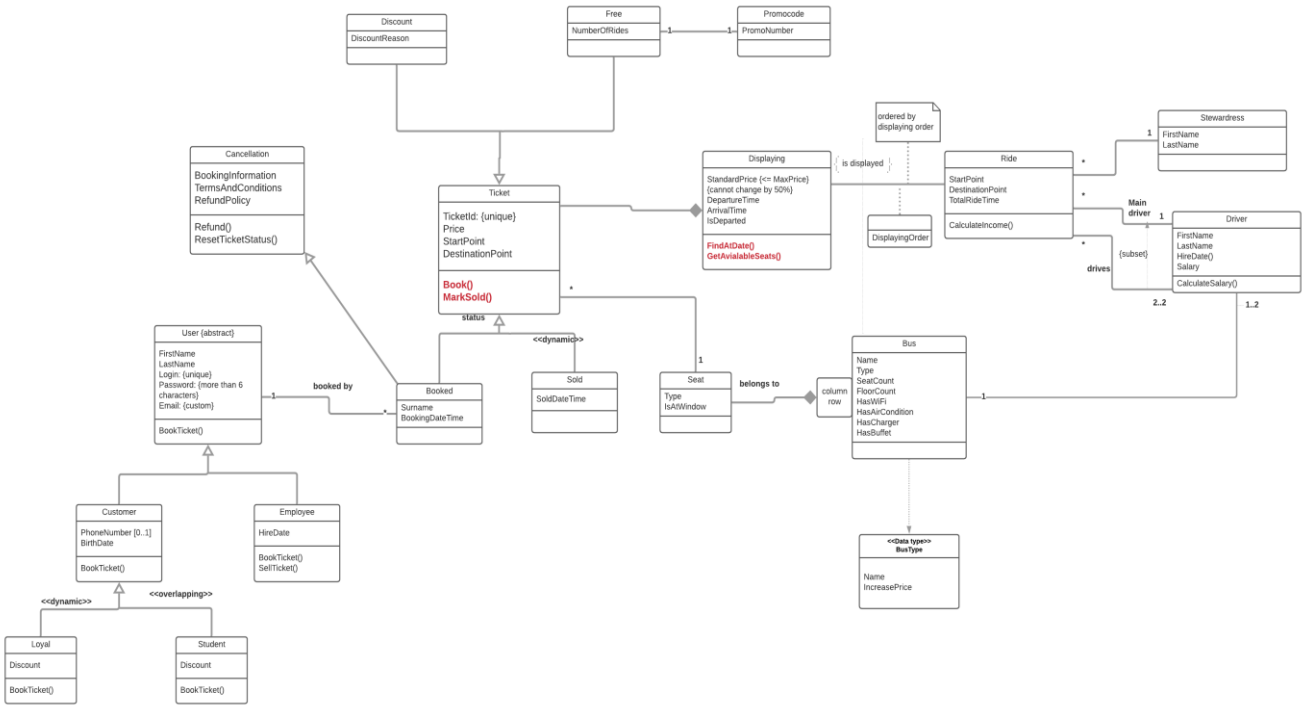
12. The system should help the customers with:

    1) Buying tickets
    2) Booking tickets
    3) Returning tickets
    4) Finding rides for a given start and destination point for the period time

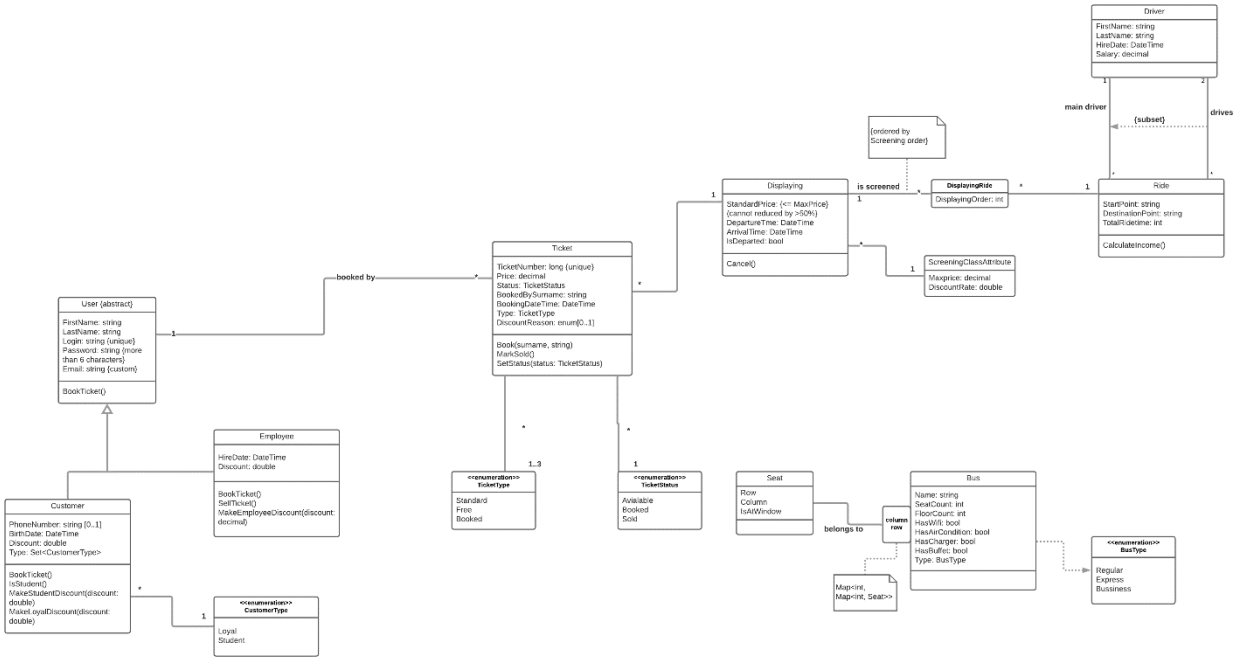
2. Use Case Diagram



3. Analytical Class Diagram



4. Design Class Diagram



5. Use Case – buying a ticket

a. Preconditions

i. Customer is logged in

b. Basic flow of evens

i. Customer opens a list of displayed rides from given start point to destination point and date

ii. Customer chooses type of bus

iii. Customer sees available seats

iv. Customer chooses a seat

v. Customer pays for the ticket

vi. Customer gets ticket id

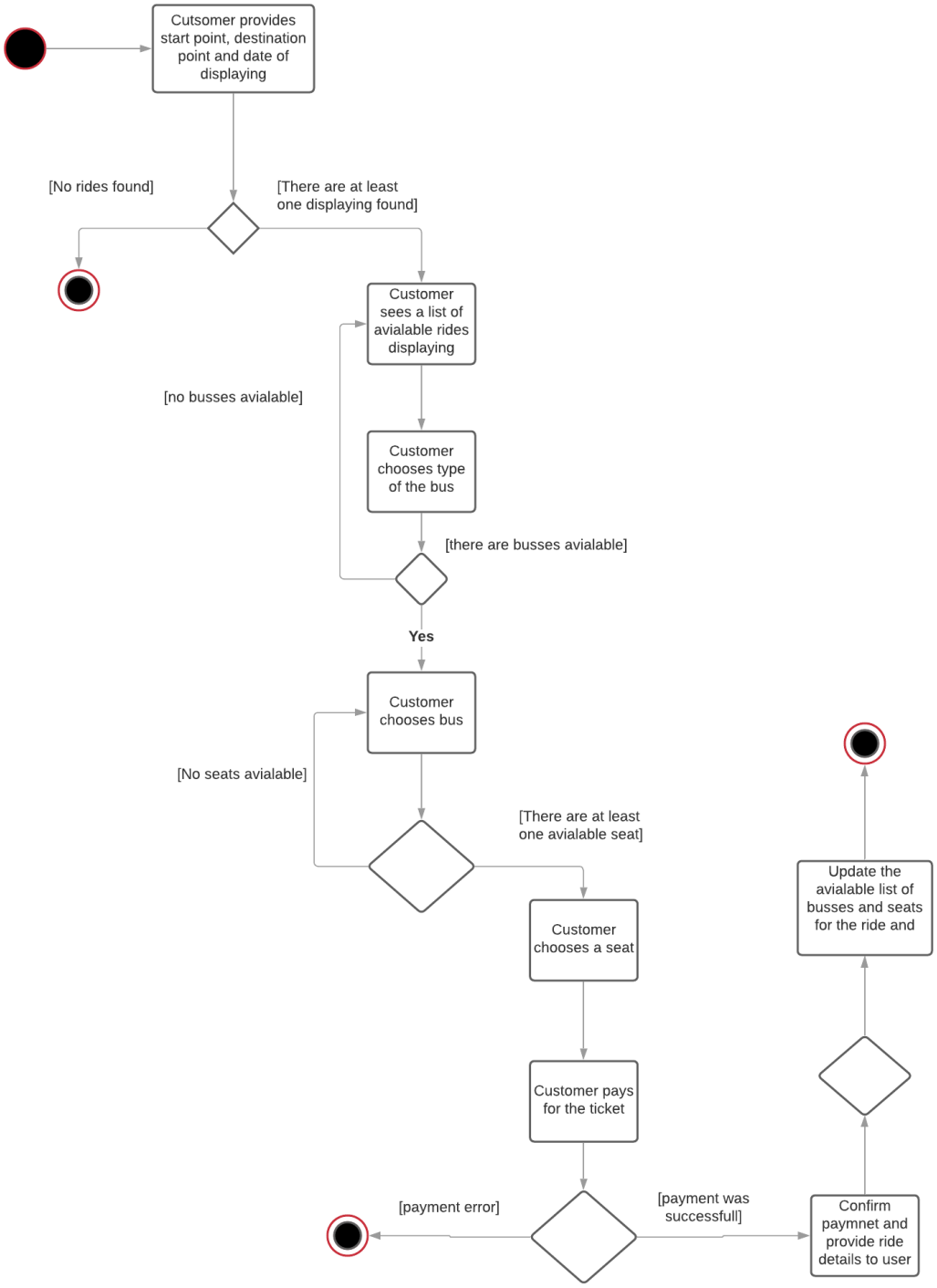
c. Alternative flow of events

i. Customer cannot find rides at a given date from departure to destination point

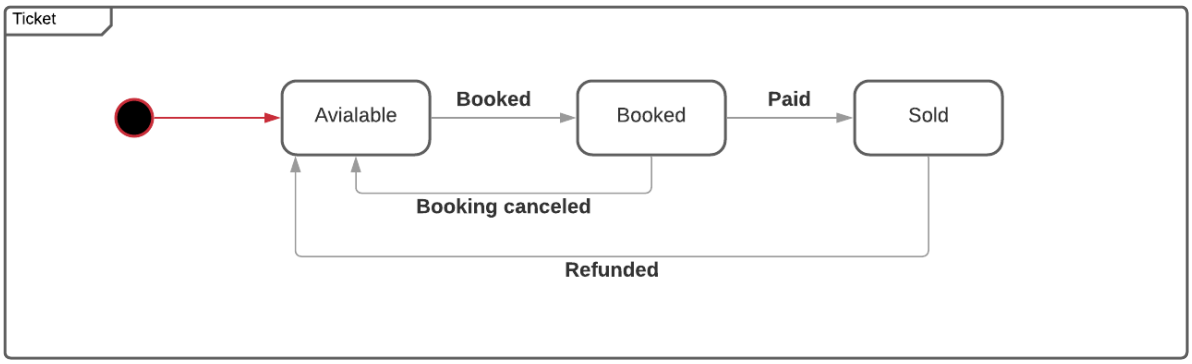
ii. Customer cannot find the bus he wants

iii. There are no available seats

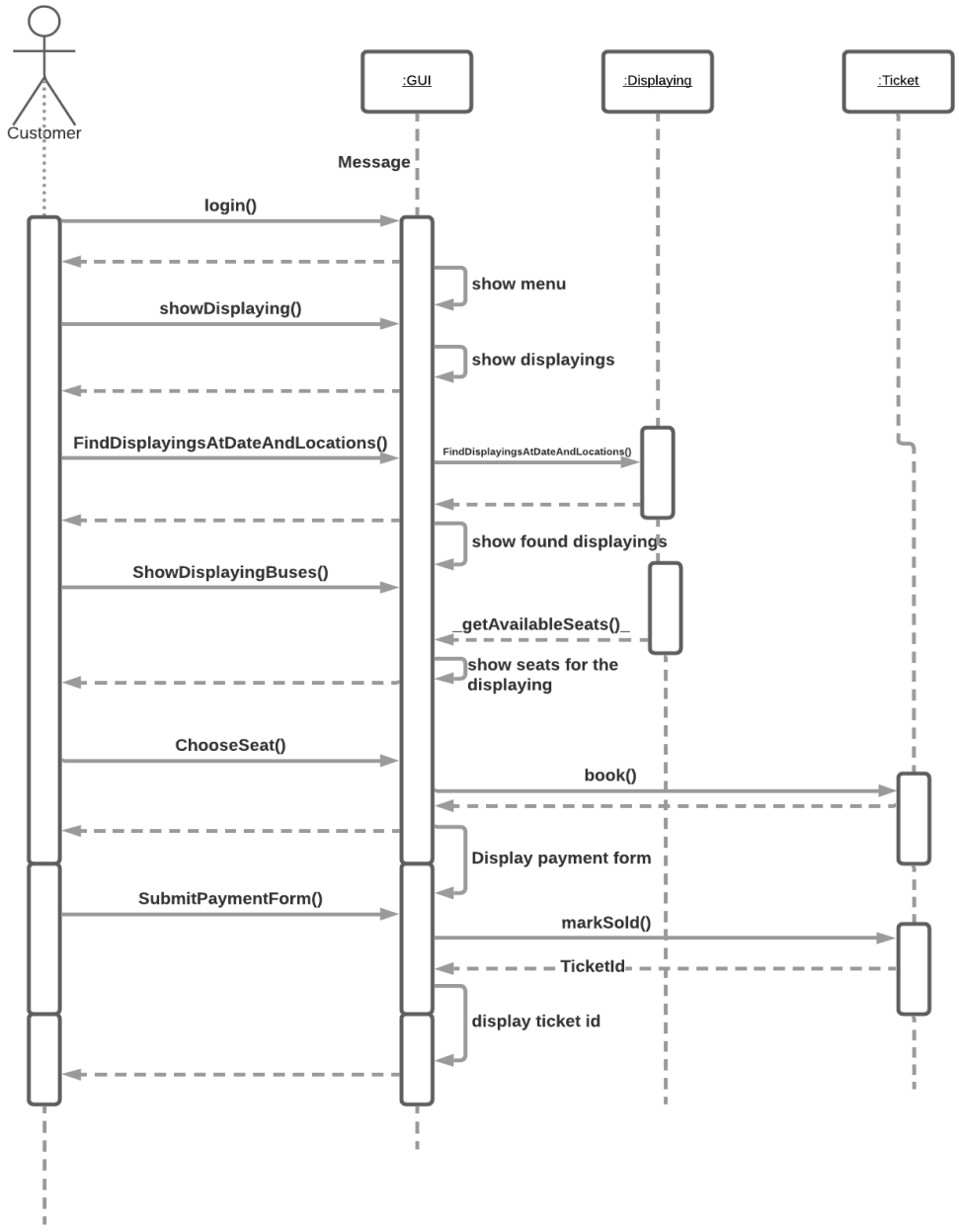
6. Activity Diagram



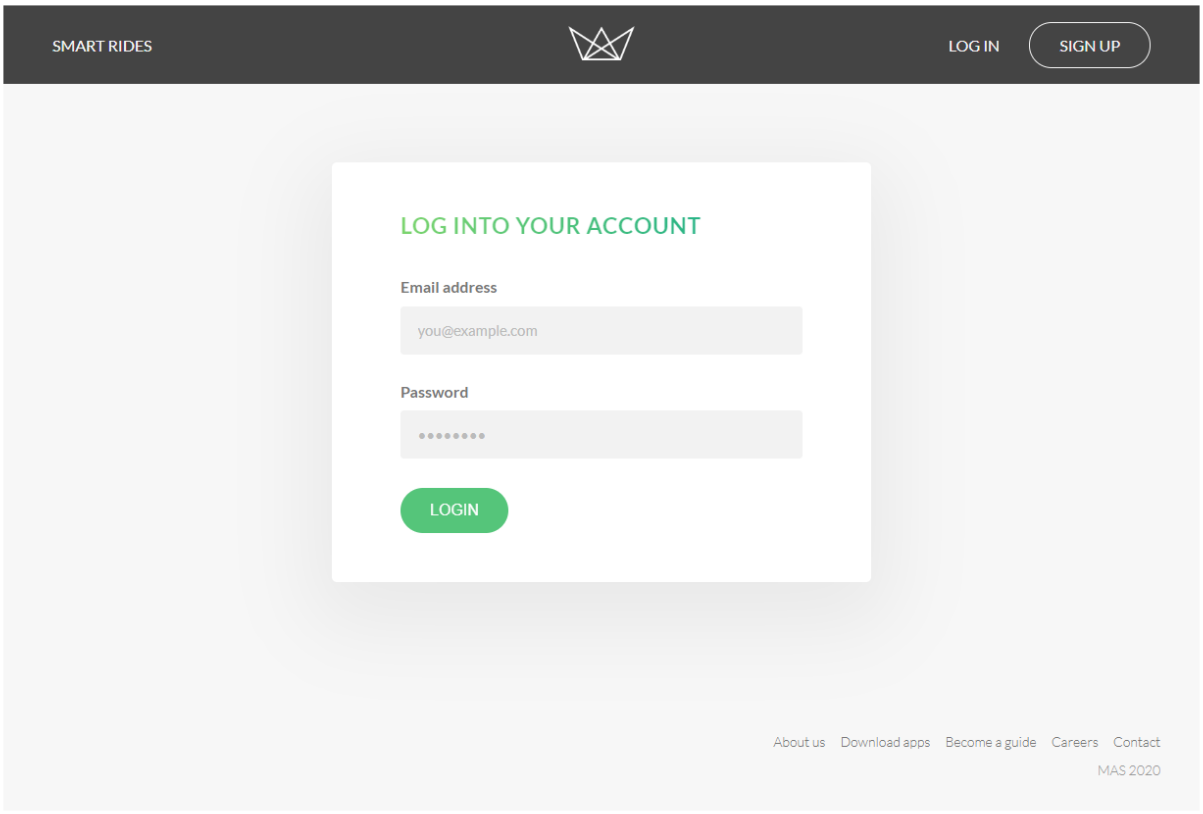
7. State Diagram

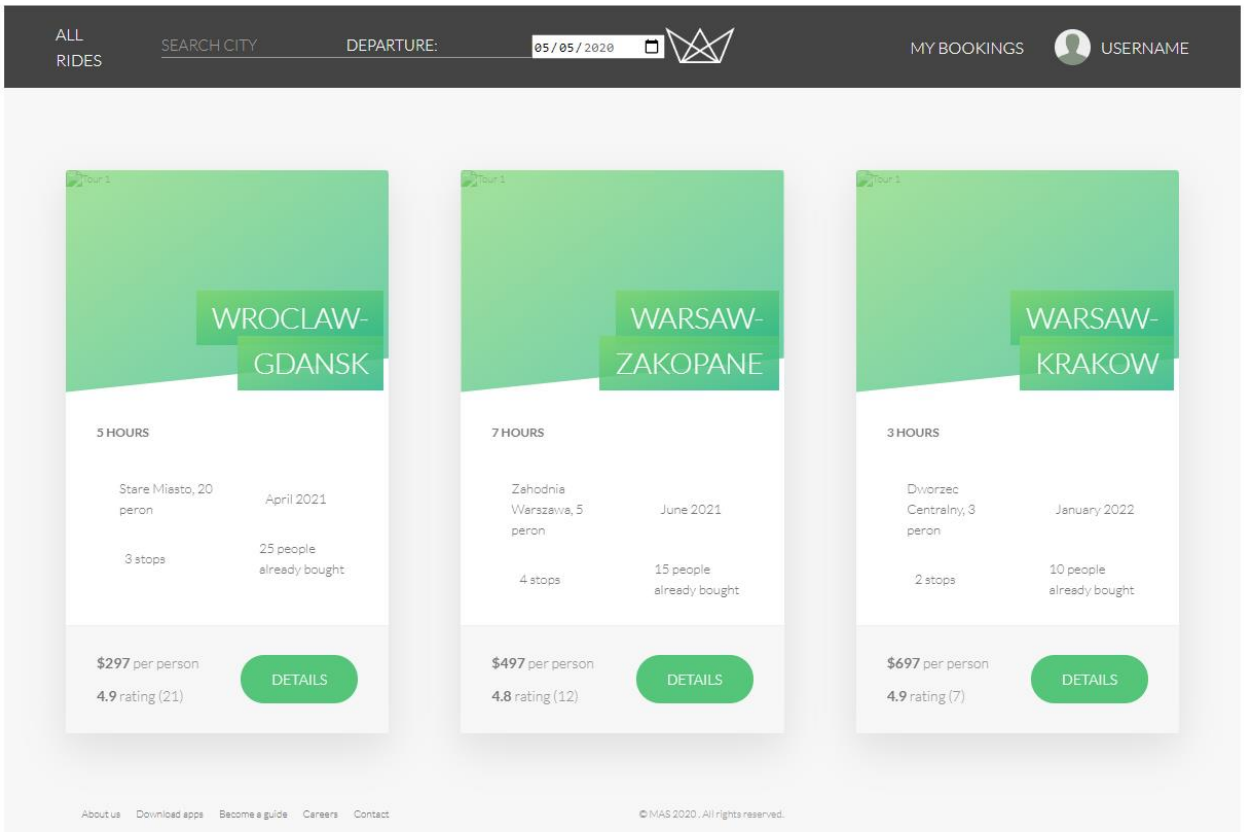


8. Sequence Diagram



9. GUI


SMART RIDES
LOG IN
SIGN UP
LOG INTO YOUR ACCOUNT
Email address
you@example.com
Password
LOGIN
About us
Download apps
Become a guide
Careers
Contact
MAS 2020


ALL RIDES
SEARCH CITY
DEPARTURE:
05/05/2020
MY BOOKINGS
USERNAME
WROCLAW-GDANSK
5 HOURS
Stare Miasto, 20 peron
April 2021
3 stops
25 people already bought
$297 per person
4.9 rating (21)
DETAILS
WARSAW-ZAKOPANE
7 HOURS
Zahodnia Warszawa, 5 peron
June 2021
4 stops
15 people already bought
$497 per person
4.8 rating (12)
DETAILS
WARSAW-KRAKOW
3 HOURS
Dworzec Centralny, 3 peron
January 2022
2 stops
10 people already bought
$697 per person
4.9 rating (7)
DETAILS
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WARSAW ZAKOPANE

DETAILS

NEXT DEPARTURE 15 August 2021, 15:00

PERON 5

SEATS LEFT 10

CLASS Bussiness

YOUR TOUR DRIVERS

SENIOR DRIVER Steven Miller

ABOUT SMART RIDES LOYAL PROGRAM

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.

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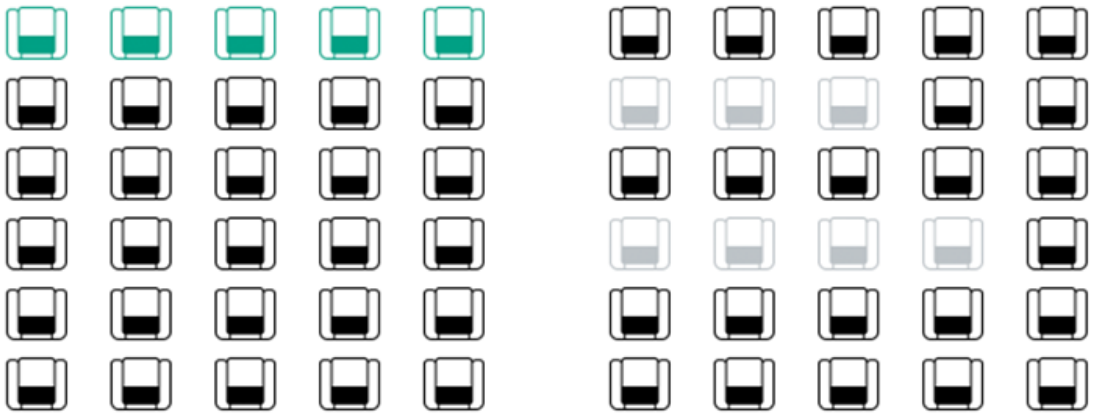

Selected Seats-1,2,3,4,5

Submit Reset

10. Analysis

After analysis it became clear that several additional methods are needed:

Book(): in Ticket

MarkSold(): in Ticket

FindByGivenLocationsAtDate(): in Displaying

GetAvialableSeats(): in Displaying

In the design class diagram, overlapping and dynamic inheritance was implemented. This was done for Ticket and Customer. A middle class Displaying was implemented for Ride and Displaying.