Cairo University  
Faculty of Computers and Artificial Intelligent

**CS251**

**Software Engineering I**

Project Name

Software Design

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# Team

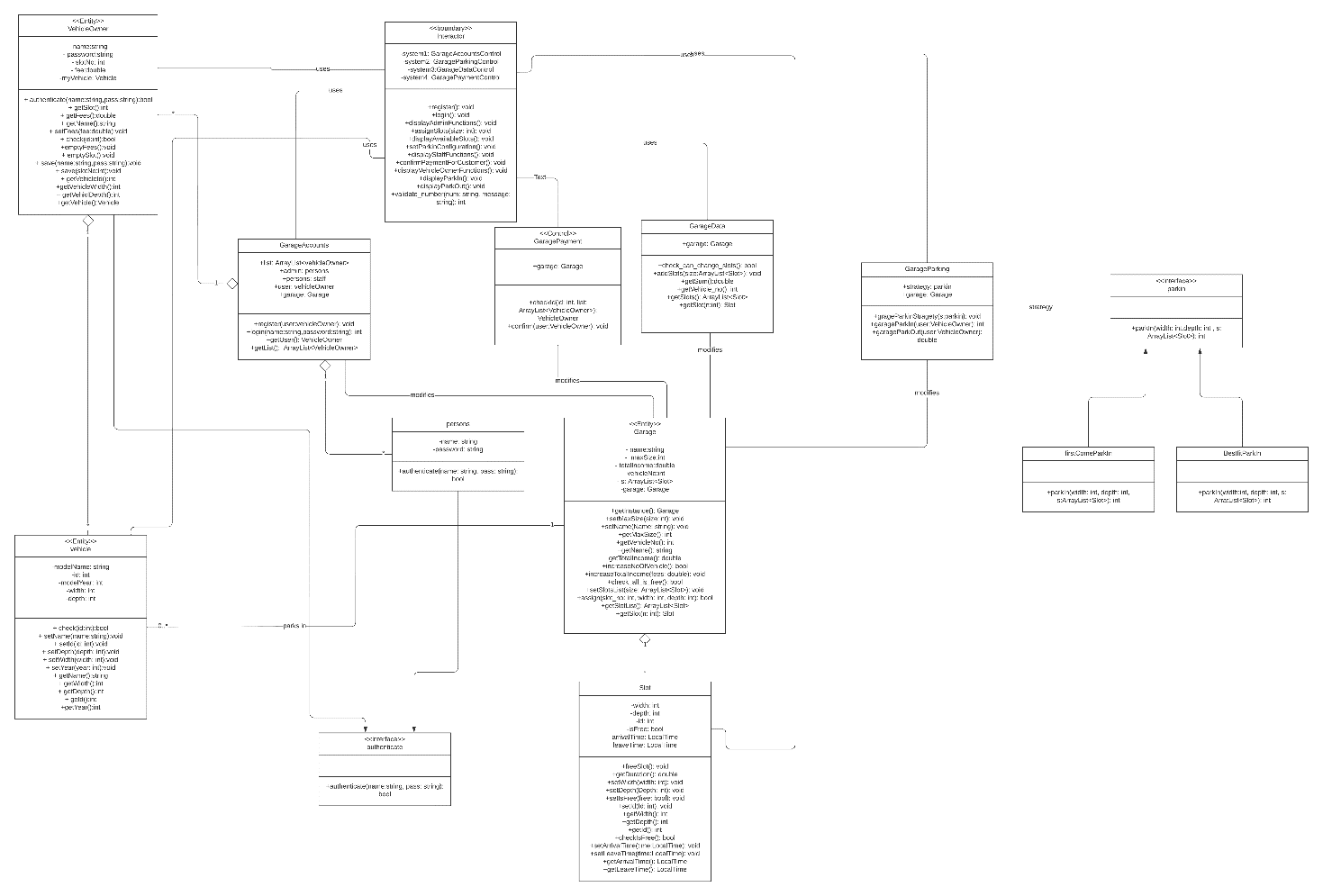
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# Document Purpose and Audience

* This document displays a software design specification for a garage parking application.
* Audience:(garage owner)

# System Models

## I. Class diagrams



**List down your classes and describe them**

| **Class ID** | **Class Name** | **Description & Responsibility** |
| --- | --- | --- |
| 1 | Persons | Stores user name and password that are used to differentiate between garage owner and staff |
| 2 | Vehicle\_owner | Identifies a customer with user name and password he uses to access application and stores the slot number he park in and the amount of fees he have to pay. |
| 3 | Vehicle | Stores information about user's vehicle. |
| 4 | Garage | Stores list of slots to be used by the system and stores Garage data like total income and total number of cars |
| 5 | Slot | Stores information about the slot in the garage and stores arrival and departure time of each user. |
| 6 | Interpreter | Is the link between the user and the program handle input and output. |
| 7 | GarageAccounts | Used to store lists of vehicle owners and persons account used to perform login and register operations. |
| 8 | GarageParking | Performs the task to park in the garage and park out users. |
| 9 | GarageData | Used to set and get the data stored in the garage. |
| 10 | GaragePayment | Used to perform payment operation and increasing the garage total income |
| 11 | FirstComeParkin | Used to park in users using first come first served method |
| 12 | BestFitParkin | Used to parkin users by searching the best slot that can hold the vehicle |

### Important Algorithm

find\_suitable\_slot()

check config type

if(config==0)

use random\_search() function to get slot\_no

else

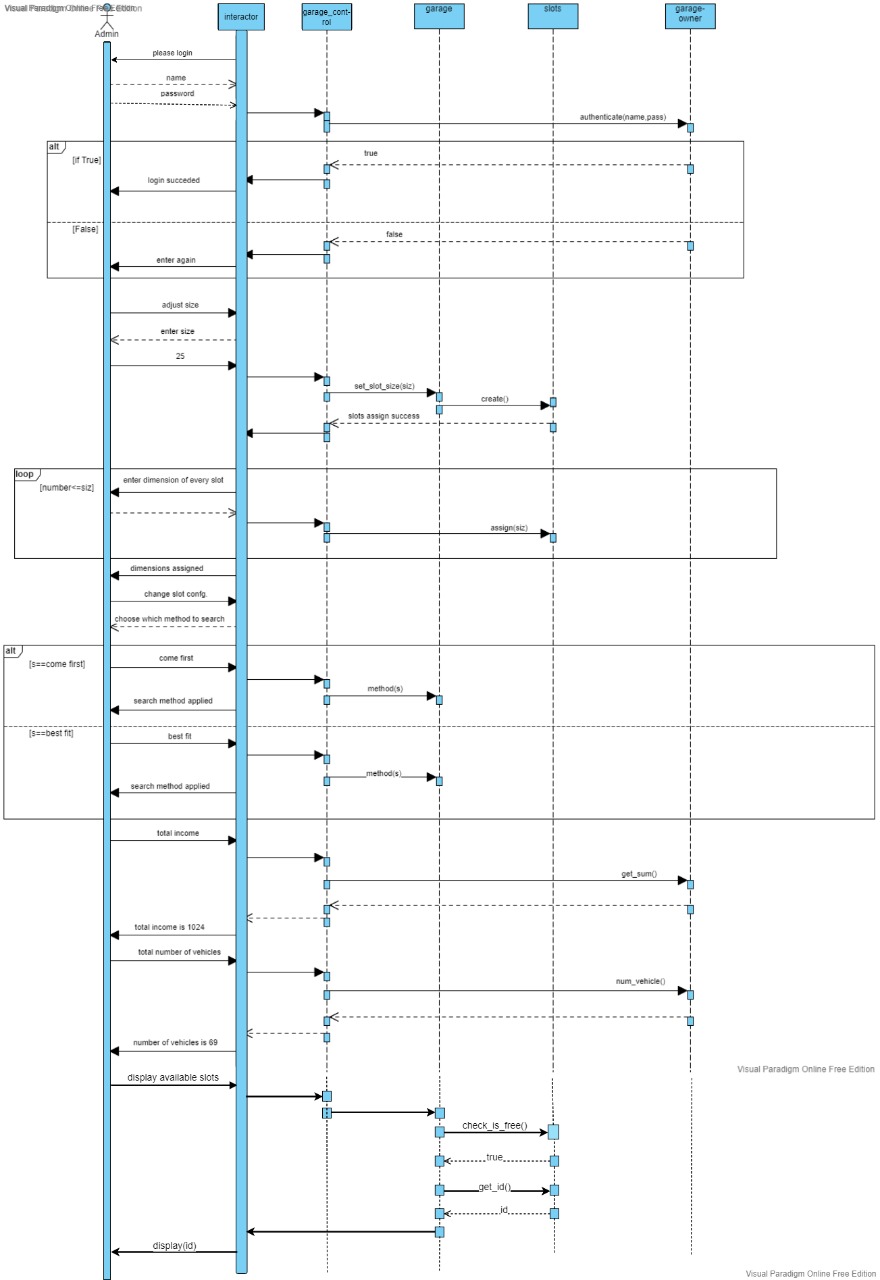
use best\_fit\_search() function

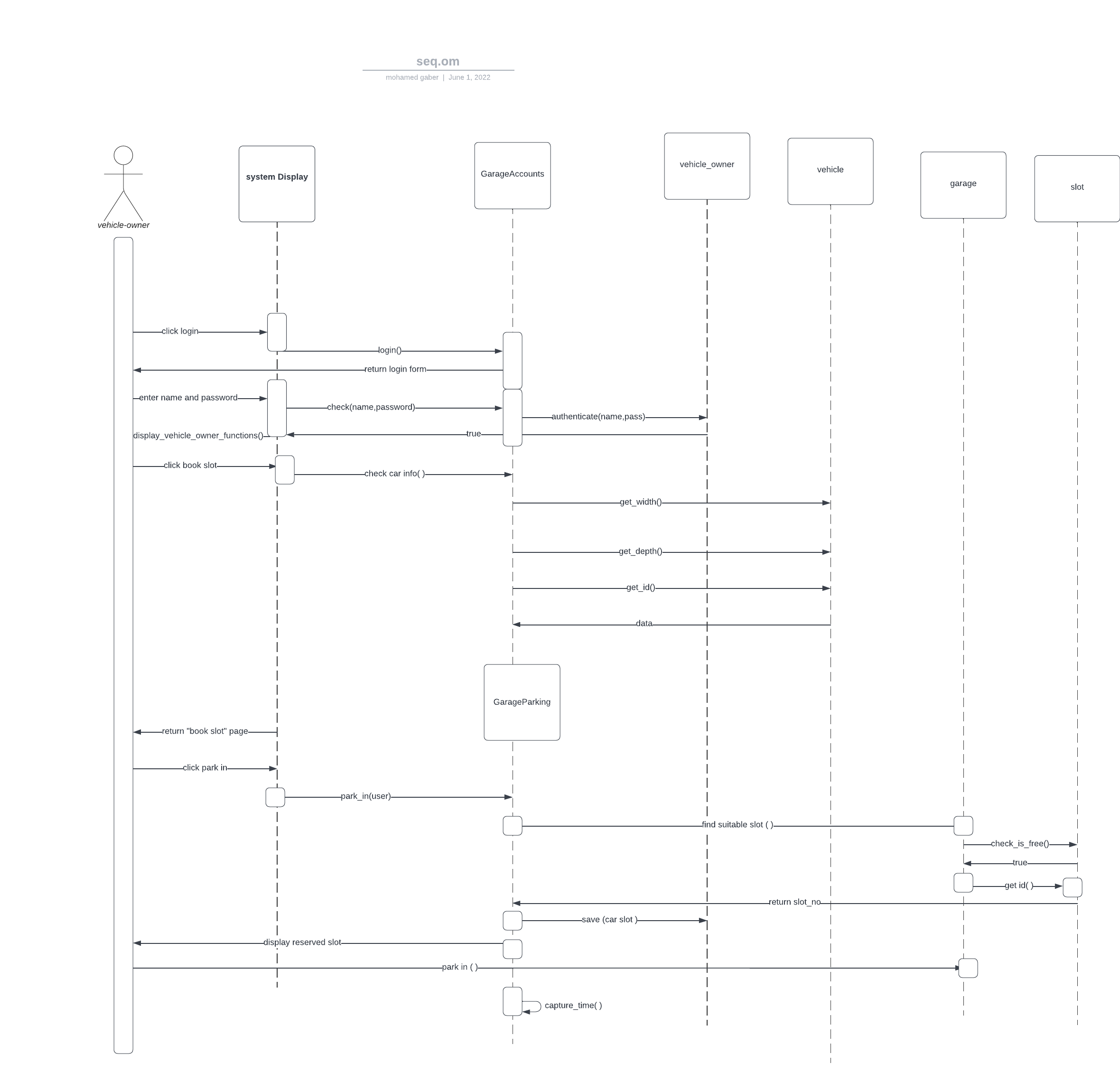
if if finds a free slot return slot number

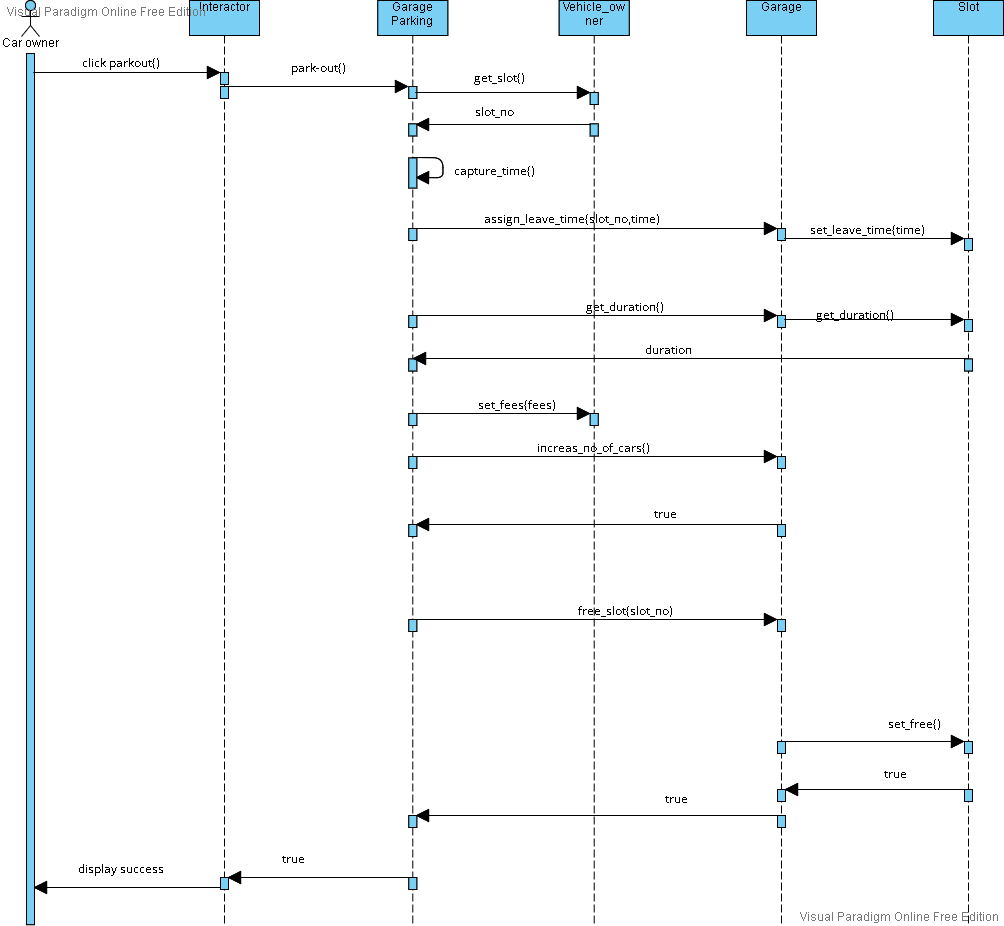
else it return -1 if there is no free slots

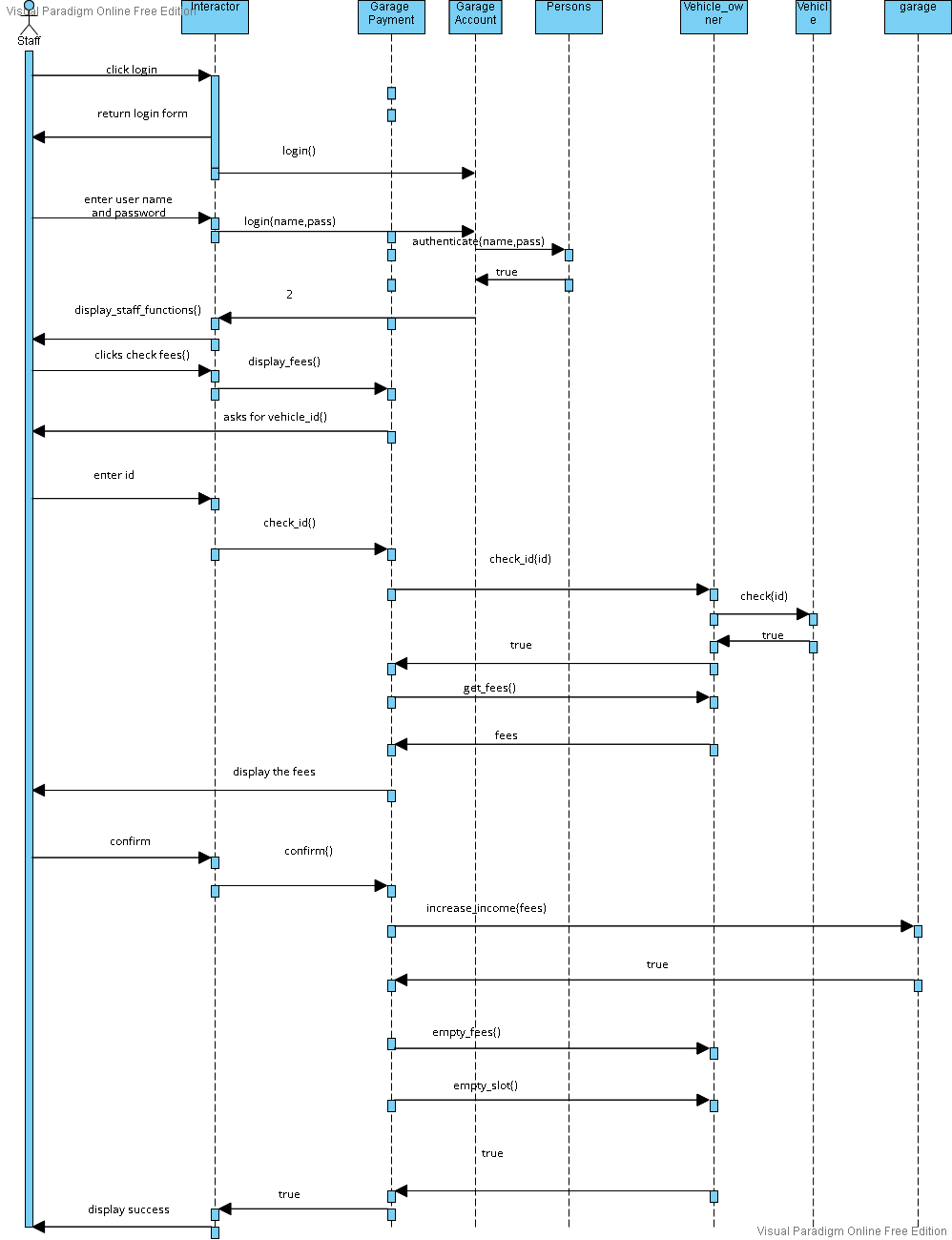
or -2 if there are slots but its dimensions is smaller than vehicle dimensions

## II. Sequence diagrams









### E:\الترم التانى\Software Engineering\Lastassign\sequence 3.vpd.png

### Class - Sequence Usage Table

| **Class Name** | **Sequence Diagrams** | **Overall used methods** |
| --- | --- | --- |
| Slot | 1,3,4 | set\_arrival\_time(), set\_leave\_time(),calculate\_fees(),set\_free(),set\_width(),set\_depth(),get\_width(),get\_depth(),check\_is\_free() |
| Garage\_owner | 1,2 | authenticate() |
| Veicle\_owner | 5,4,3,2 | authenticate(),get\_fees(),set\_slot() set\_fees(),check(),empty\_fees(),empty\_slot(),save() |
| Staff | 2,5 | authenticate() |
| Vehicle | 2,3,5 | set\_name(),set\_data(),get\_name(),get\_depth(),get\_width ,check() |
| Garage | 1,3,4,5 | assign\_leave\_time(),get\_fees(),increas\_no\_of\_vehicles(),free\_slot(),increase\_income(),set\_slot\_size(),assign(),set\_config(),park\_in(),find\_suitable\_slot() |
| GarageAccounts | 1,2,3,4,5 | Register() Login() getUser()  getList() |
| Interactor | 1,2,3,4,5 | park\_out() confirm() check\_fees() register() display\_vehicle\_owner\_functions():display\_admin\_functions() display\_staff\_functions() park\_in() book\_slot() adjust\_size() change\_slot\_config():void get\_total\_income() get\_total\_number() |
| GarageParking | 2,4 | park\_out() captureTime() parkIn() garage\_search\_strategy() |
| GarageData | 1,2,4 | Setfees()  Get\_fees()  Getslot()  Getslots()  Set\_vehicleno() |
| GaragePayemnt | 4 | confirmPayment() |

# Ownership Report

|  |  |
| --- | --- |
| **Item** | **Owners** |
| Class diagram | *20201007,20201003* |
| Sequence diagram | *20201122,20201145* |