OOP C#

Renting cars

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Description of the project:

I have a car rental system that has 2 options one of them is to return a car and the other is to rent a car and the system should print the bill to the customer after renting is approved.

Use case scenario:

1. First thing the customer will be asked weather he wants to rent a car or to return a car.

If he chooses to rent a car he will be asked for some personal information

And after that he will be asked which car do you want to rent.

After he chooses a car a bill will be printed

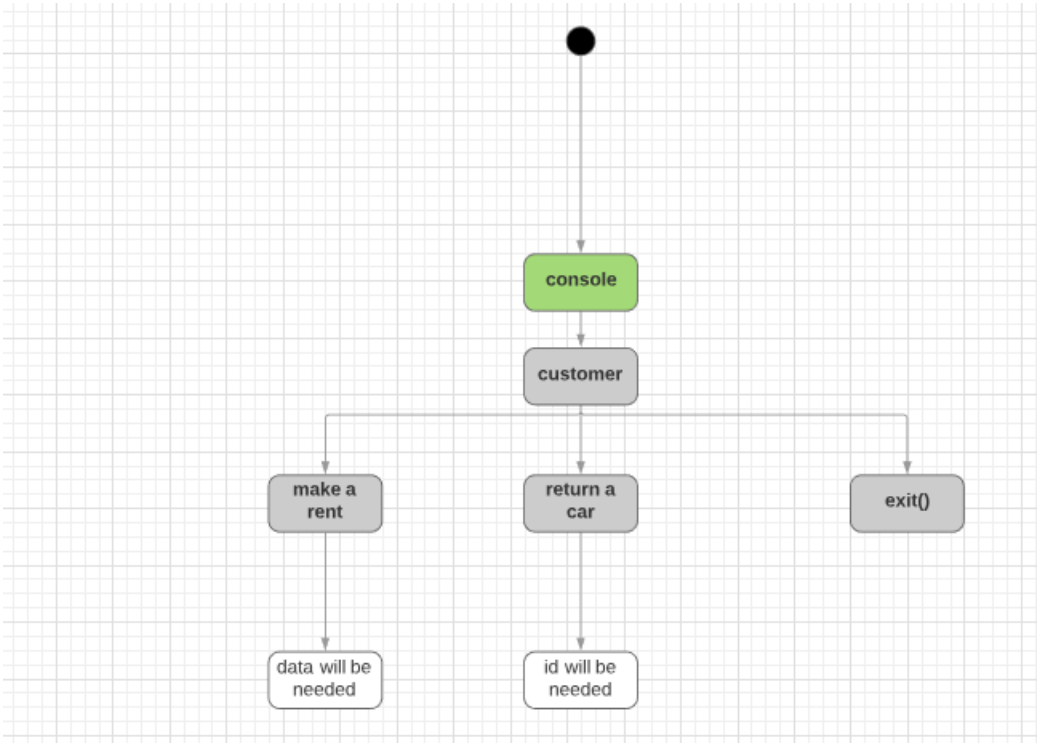
And the total will be shown and the customer will be asked do you want to approve the rent if the customer says yes an operation insert will happen into the database if he says no the system will go back to step 1

If the customer at the beginning chooses to return a car, he will be asked for his id and then we will check if we have such a rent if yes we will delete the rent from the database and will print a success message to the customer otherwise we will print an error message.

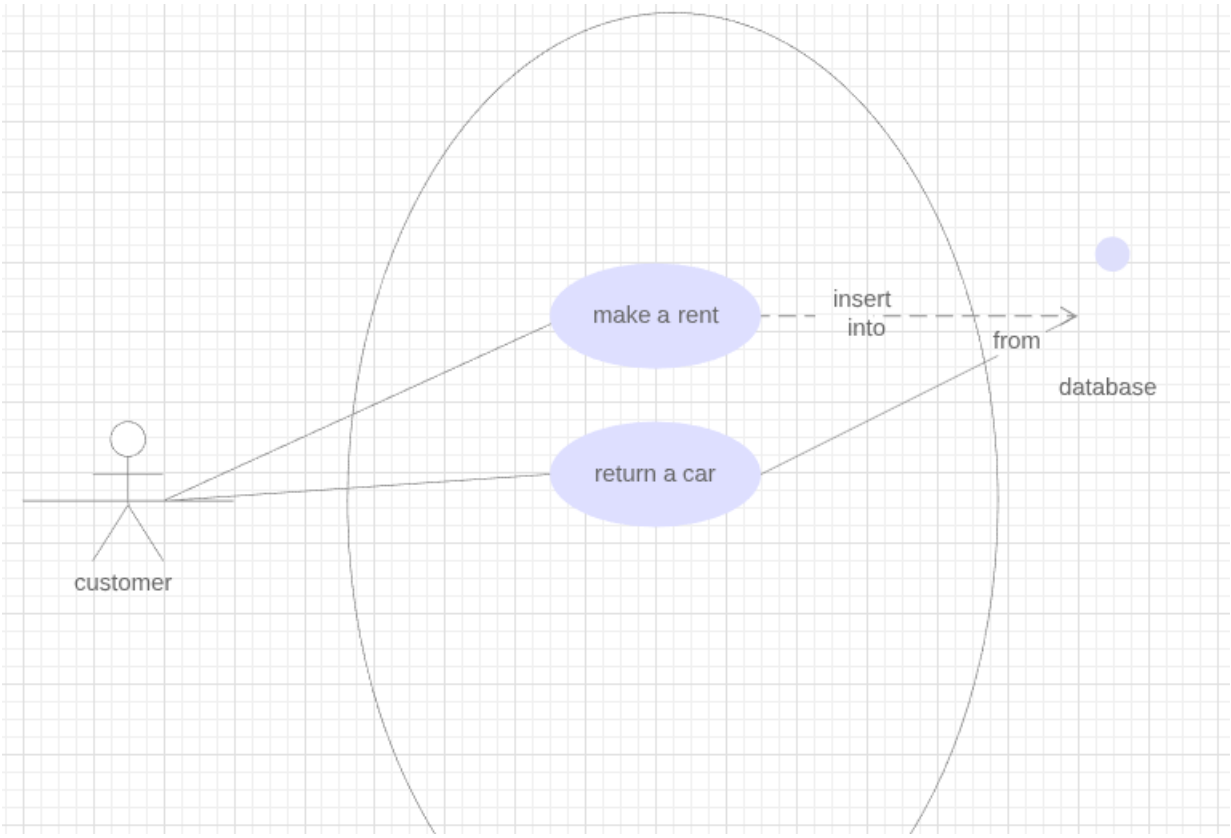
After all operations the system should go back to step 1 except if the user inputs -1.

UML diagram:

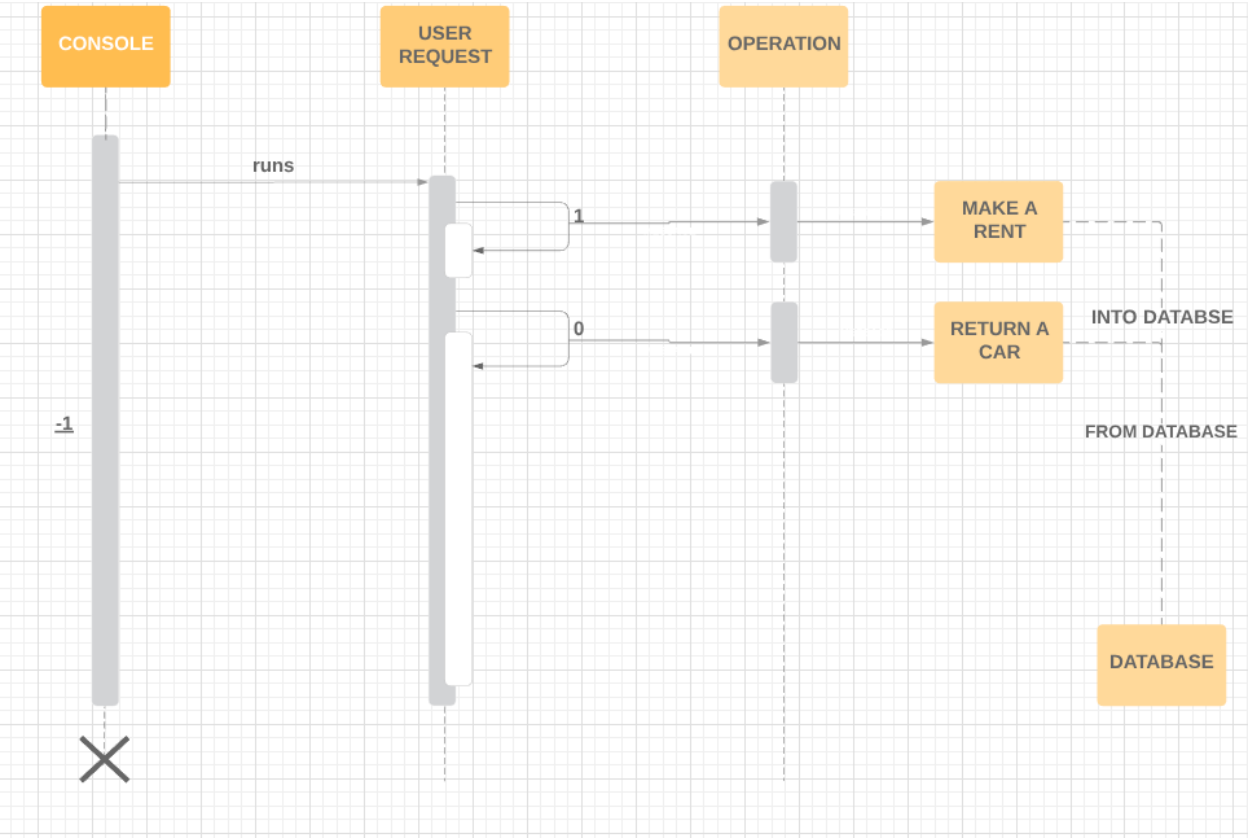
Basic activity diagram



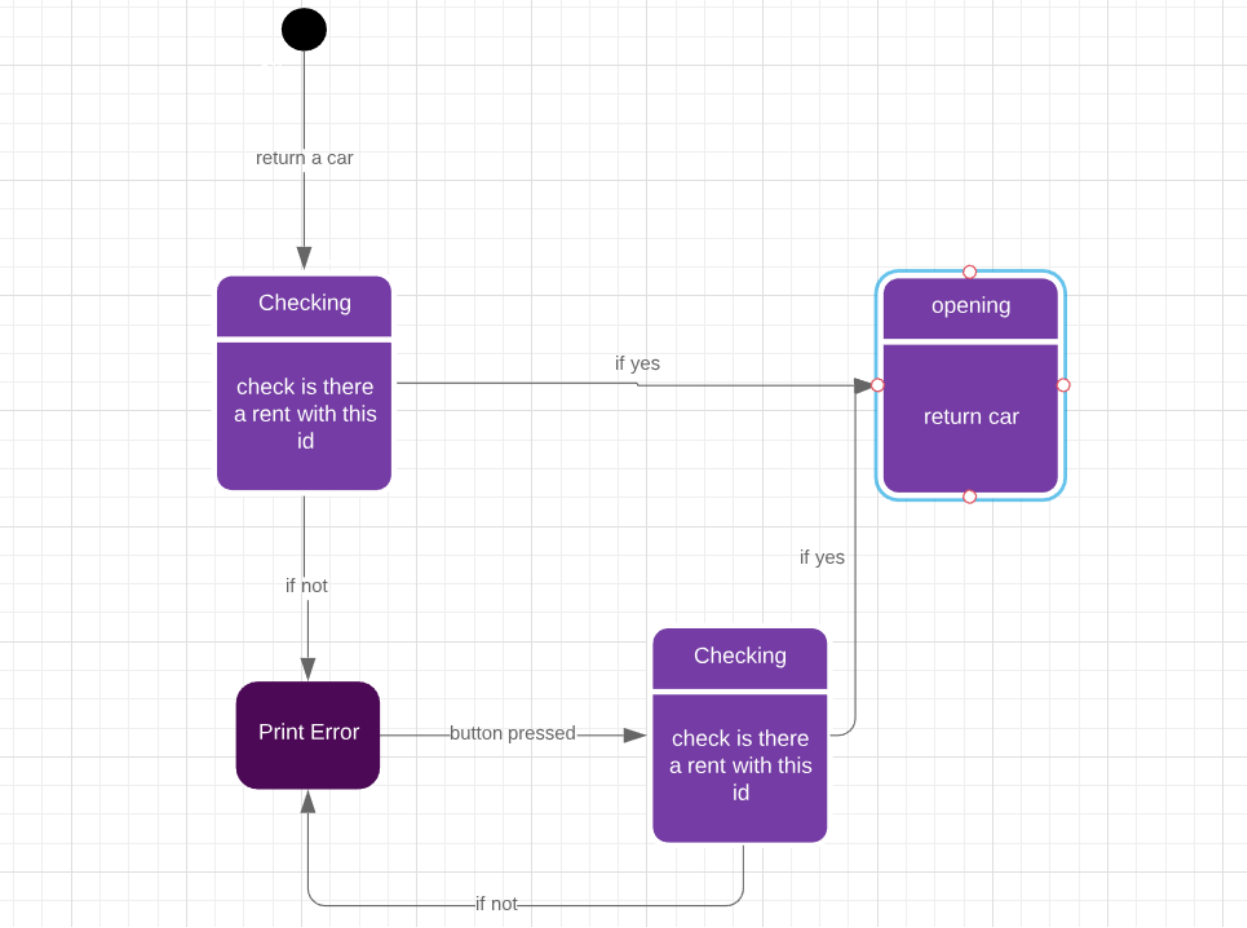
Use case diagram



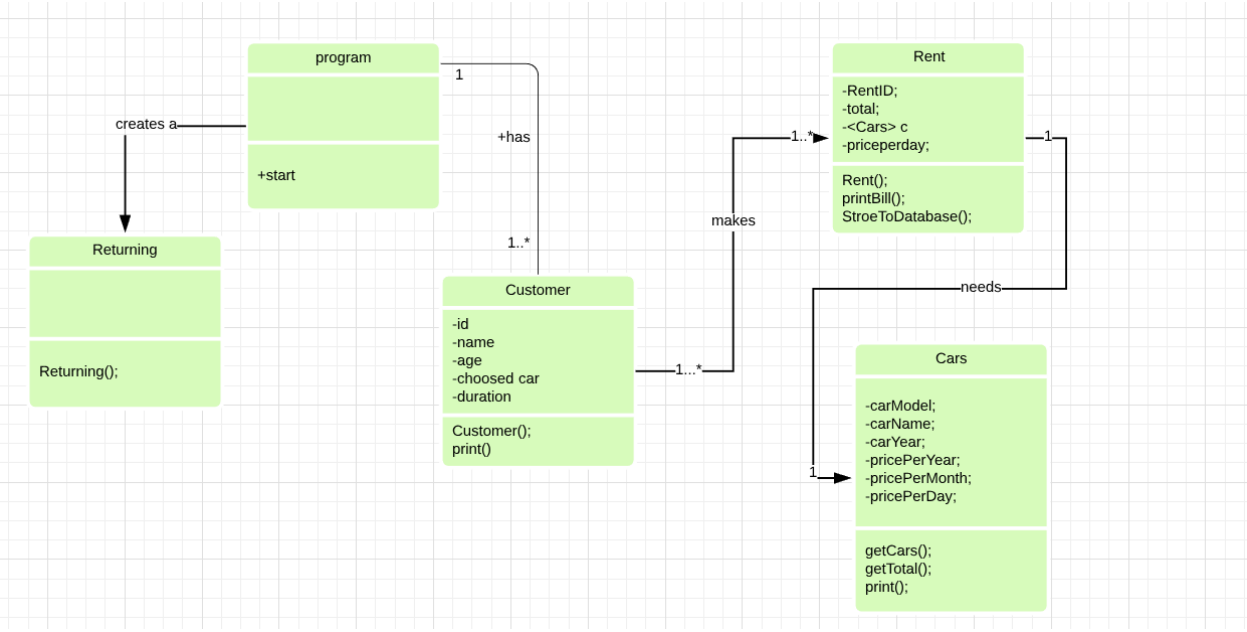
Sequence diagram



Basic state diagram



CLASS DIAGRAM



Code:

Main

```
using System;

namespace Console_Oop_Project
{
    class Program
    {
        public static void Main(string[] args)
        {
            int checker = start();
            while (checker != -1)
            {
                while (checker == 1)
                {
                    Customer c1 = new Customer();
                    Rent r1 = new Rent(c1);
                    checker = start();
                }

                while (checker == 0)
                {
                    string id;
                    Console.Write("please enter your ID: ");
                    id = Console.ReadLine();
                    Returning return1 = new Returning(id);
                    checker = start();
                }
            }



        }
        public static int start()
        {
            Console.WriteLine("Please enter 1 for renting a car and 0 for returning a car and -1 to terminate: ");
            int checker = Convert.ToInt32(Console.ReadLine());
            return checker;
        }
    }
}

```

Cars

```
1   using System;
2   using System.Collections.Generic;
3
4   namespace Console_Oop_Project
5   {
6       class Cars
7       {
8           private string carModel;
9           private string carName;
10          private int carYear;
11          private Double pricePerYear;
12          private Double pricePerMonth;
13          private Double pricePerDay;
14
15          public string CarModel
16          {
17              get
18              {
19                  return this.carModel;
20              }
21              set
22              {
23                  this.carModel = value;
24              }
25          }
26          public string CarName
27          {
28              get
29              {
30                  return this.carName;
31              }
32              set
33              {
34                  this.carName = value;
35              }
36          }
```

```
37          public int CarYear
38          {
39              get
40              {
41                  return this.carYear;
42              }
43              set
44              {
45                  this.carYear = value;
46              }
47          }
48          public double PricePerYear
49          {
50              get
51              {
52                  return this.pricePerYear;
53              }
54              set
55              {
56                  this.pricePerYear = value;
57              }
58          }
59          public double PricePerMonth
60          {
61              get
62              {
63                  return this.pricePerMonth;
64              }
65              set
66              {
67                  this.pricePerMonth = value;
68              }
69          }
70          public double PricePerDay
71          {
72              get
73              {
74                  return this.pricePerDay;
75              }
76              set
77              {
78                  this.pricePerDay = value;
79              }
80          }
```

```
82      public List<Cars> getCars()
83      {
84          var cars = new List<Cars>();
85          cars.Add(new Cars()
86          {
87              CarModel = "HA18",
88              CarName = "Hyundai Accent",
89              CarYear = 2018,
90              PricePerDay = 15,
91              PricePerMonth = 25,
92              PricePerYear = 27,
93          });
94          cars.Add(new Cars()
95          {
96              CarModel = "HA17",
97              CarName = "Hyundai Accent",
98              CarYear = 2017,
99              PricePerDay = 10,
100             PricePerMonth = 12,
101             PricePerYear = 23,
102         });
103         cars.Add(new Cars()
104         {
105             CarModel = "HA15",
106             CarName = "Hyundai Accent",
107             CarYear = 2015,
108             PricePerDay = 5,
109             PricePerMonth = 13,
110             PricePerYear = 18,
111         });
112         cars.Add(new Cars()
113         {
114             CarModel = "FD18",
115             CarName = "Fiat Doblo",
116             CarYear = 2018,
117             PricePerDay = 20,
118             PricePerMonth = 35,
119             PricePerYear = 50,
120         });
```

```
121                 cars.Add(new Cars()
122                 {
123                     CarModel = "FD16",
124                     CarName = "Fiat Doblo",
125                     CarYear = 2016,
126                     PricePerDay = 15,
127                     PricePerMonth = 20,
128                     PricePerYear = 35,
129                 });
130                 return cars;
131             }
132 
133             public Double getTotal(int duration, double PricePerD, double PricePerM, double PricePerY)
134             {
135                 double total = 0;
136                 if (duration < 30)
137                 {
138                     total = duration * PricePerD;
139                 }
140                 else if (duration > 30 && duration < 180)
141                 {
142                     total = PricePerM * duration;
143                 }
144                 else
145                 {
146                     total = PricePerY * duration;
147                 }
148                 return total;
149             }
150 
151             public void print()
152             {
153                 Console.WriteLine(carModel + " " + carName + " " + carYear + " " + pricePerYear);
154             }
155         }
156     }
157 
```

Customers

```
using System;
using System.Collections.Generic;

namespace Console_Oop_Project
{
    class Customer
    {
        private int customerID;
        private string name;
        private int age;
        private int choosenCar;
        private Int32 duration;

        public Customer()
        {
            List<Cars> c = new List<Cars>();
            c = (new Cars()).getCars();
            //my random generator
            Random r1 = new Random();
            //setting a random number for the id of the customer
            CustomerID = r1.Next(1, 10000);

            //getting user input for name
            Console.WriteLine("Enter your full name: ");
            Name = Console.ReadLine();

            //getting user input for age
            Console.WriteLine("Enter your age: ");
            Age = Convert.ToInt32(Console.ReadLine());

            //getting the input of the choosen car
            Console.WriteLine("please enter the number of the car you want to rent: ");
            int counter = 1;
            foreach (var aCar in c)
            {
                Console.WriteLine(counter + "." + aCar.CarName + " " + aCar.CarYear);
                counter++;
            }
            choosenCar = Convert.ToInt32(Console.ReadLine()) - 1;

            //getting for how long does the user need the car
            Console.WriteLine("For how long do you need the car(in days) 365 days = 1 year: ");
            Duration = Convert.ToInt32(Console.ReadLine());

        }
```

```
47          public int ChoosenCar
48          {
49              get
50              {
51                  return this.choosenCar;
52              }
53              set
54              {
55                  this.choosenCar = value;
56              }
57          }
58
59          public Int32 Duration
60          {
61              get
62              {
63                  return this.duration;
64              }
65              set
66              {
67                  this.duration = value;
68              }
69          }
70
71          public int CustomerID
72          {
73              get
74              {
75                  return this.customerID;
76              }
77              set
78              {
79                  this.customerID = value;
80              }
81          }
82          public string Name
83          {
84              get
85              {
86                  return this.name;
87              }
88              set
89              {
90                  this.name = value;
91              }
92          }
```

```
93          public int Age
94          {
95              get
96              {
97                  return this.age;
98              }
99              set
100             {
101                 while(value < 18)
102                 {
103                     Console.Write("please enter an age that is bigger than 18: ");
104                     value = Convert.ToInt32(Console.ReadLine());
105                 }
106                 this.age = value;
107             }
108         }
109
110         public void print()
111         {
112             Console.WriteLine(CustomerID + " " + Name + " " + Age);
113         }
114     }
115 }
116
```

Rent

```
using System;
using System.Collections.Generic;
using System.Data.OleDb;

namespace Console_Oop_Project
{
    class Rent
    {
        //attributer or properties
        private int RentID;
        private double total;
        private List<Cars> c = new List<Cars>();
        private double priceperday;

        //constructor 1
        public Rent(Customer c1)
        {
            c = (new Cars()).getCars();


            int duration = c1.Duration;
            int car = c1.ChoosenCar;
            Total = c[car].getTotal(duration, c[car].PricePerDay, c[car].PricePerMonth, c[car].PricePerYear);
            priceperday = Total / duration;
            printBill(c1);
            Console.WriteLine("Do you approve?y or n");
            char check = Convert.ToChar(Console.ReadLine());
            if(check == 'y')
            {
                StoreToDatabase(c1, car, duration);
            }
            else
            {
                Console.WriteLine("Your operation is cancelled");
            }
        }

        //get and set for my id attribute
        public int rentID{
            get
            {
                return this.rentID;
            }
            set
            {
                this.RentID = value;
            }
        }
```

```
        //get and set for my total attribute
        public double Total
        {
            get
            {
                return this.total;
            }
            set
            {
                this.total = value;
            }
        }

        public void printBill(Customer c1)
        {
            Console.WriteLine();
            Console.WriteLine("--------------------------------------bill----------------------------------------");
            Console.WriteLine("ID\tName\t\t\tAge\tCar\t\t\tDuration\tpriceperday");
            Console.WriteLine(c1.CustomerID + "\t" + c1.Name + "\t\t" + c1.Age + "\t" + c[c1.ChoosenCar].CarName + "\t\t" + c1.Duration + "\t\t" + priceperday);
            Console.WriteLine("total is: " + Total);
        }

        public void StoreToDatabase(Customer c1, int car, int duration)
        {
            OleDbConnection con = new OleDbConnection();
            con.ConnectionString = "Provider=Microsoft.Jet.OLEDB.4.0;Data Source=E:/For_Backup/UniversitySubjects/university_docs/thirdYear/First_Semester/C#/Cons
            OleDbCommand cmd = new OleDbCommand();
            cmd.Connection = con;
            cmd.CommandText = "INSERT INTO RentedCars VALUES('" + c1.CustomerID + "','" + c1.Name + "','" + c1.Age + "','" + c[car].CarName + "','" + c[car].CarMo
            con.Open();
            int result = cmd.ExecuteNonQuery();
            con.Close();
            if (result > 0)
            {
                Console.WriteLine("Inserted");
            }
            else
            {
                Console.WriteLine("Three are errors. The record was not inserted.");
            }
        }
    }
}
```

Returning

```
using System;
using System.Data.OleDb;

namespace Console_Oop_Project
{
    class Returning
    {
        public Returning(string ID)
        {
            OleDbConnection con = new OleDbConnection();
            con.ConnectionString = "Provider=Microsoft.Jet.OLEDB.4.0;Data Source=E:/For_Backup/UniversitySubjects/university_docs/thirdYear/First
            OleDbCommand cmd = new OleDbCommand();
            cmd.Connection = con;
            cmd.CommandText = "DELETE from RentedCars where ID=" + ID;
            con.Open();
            int result = cmd.ExecuteNonQuery();
            con.Close();
            if (result > 0)
            {
                Console.WriteLine("You car is returned.");
            }
            else
            {
                Console.WriteLine("Rent is not existed.");
            }
            Program p = new Program();
        }
    }
}
```

Output:

First use case

```
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
1
Enter your full name:
mhd omar
Enter your age:
25
please enter the number of the car you want to rent:
1.Hyundai Accent 2018
2.Hyundai Accent 2017
3.Hyundai Accent 2015
4.Fiat Doblo 2018
5.Fiat Doblo 2016
4
For how long do you need the car(in days) 365 days = 1 year:
650

-------------------------------------bill-----------------------------------------
ID      Name                    Age     Car                     Duration        priceperday
8089    mhd omar                25      Fiat Doblo              650             50
total is: 32500
Do you approve?y or n
y
Inserted
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
```

Second use case

```
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
1
Enter your full name:
mhd omar
Enter your age:
25
please enter the number of the car you want to rent:
1.Hyundai Accent 2018
2.Hyundai Accent 2017
3.Hyundai Accent 2015
4.Fiat Doblo 2018
5.Fiat Doblo 2016
4
For how long do you need the car(in days) 365 days = 1 year:
265

-------------------------------------bill-----------------------------------------
ID      Name                    Age     Car                     Duration        priceperday
1760    mhd omar                25      Fiat Doblo              265             50
total is: 13250
Do you approve?y or n
n
Your operation is cancelled
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
```

Third use case

```
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
0
please enter your ID: 1760
Rent is not existed.
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
```

Forth use case

```
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
0
please enter your ID: 8089
You car is returned.
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
```

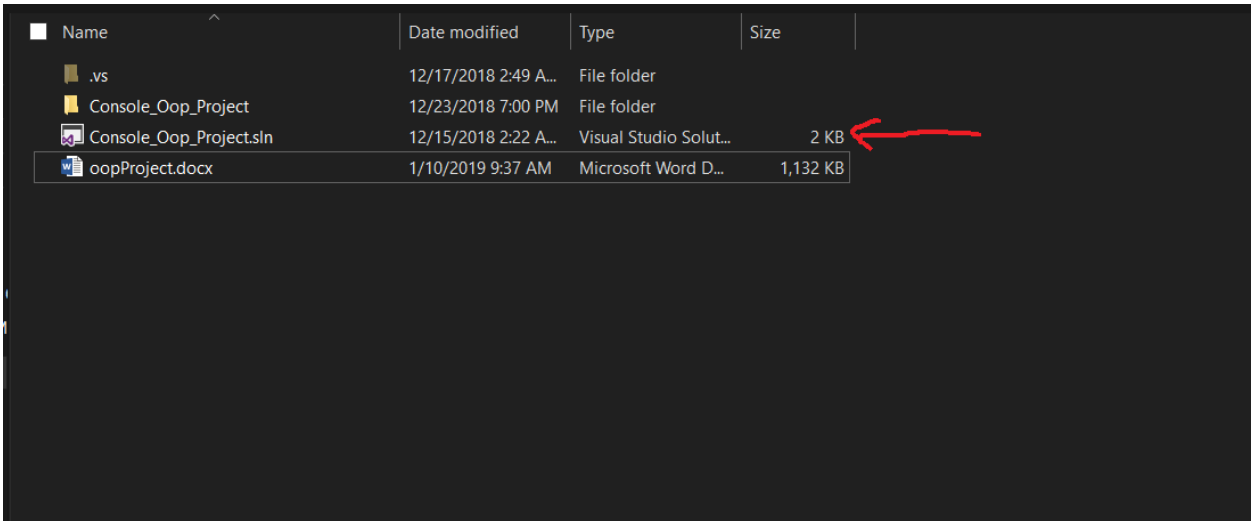
User Guideline:

System Requirements:

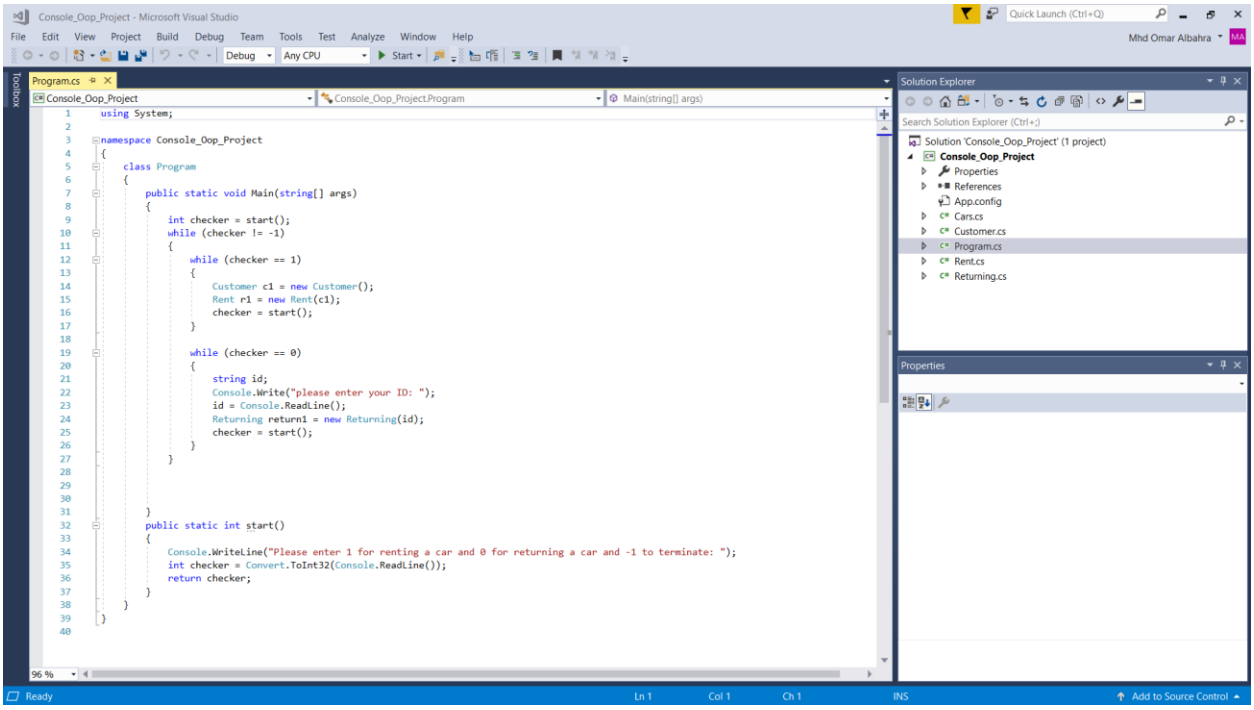
You only need a windows operating system and Microsoft visual studio with c# compiler

Launching the application:

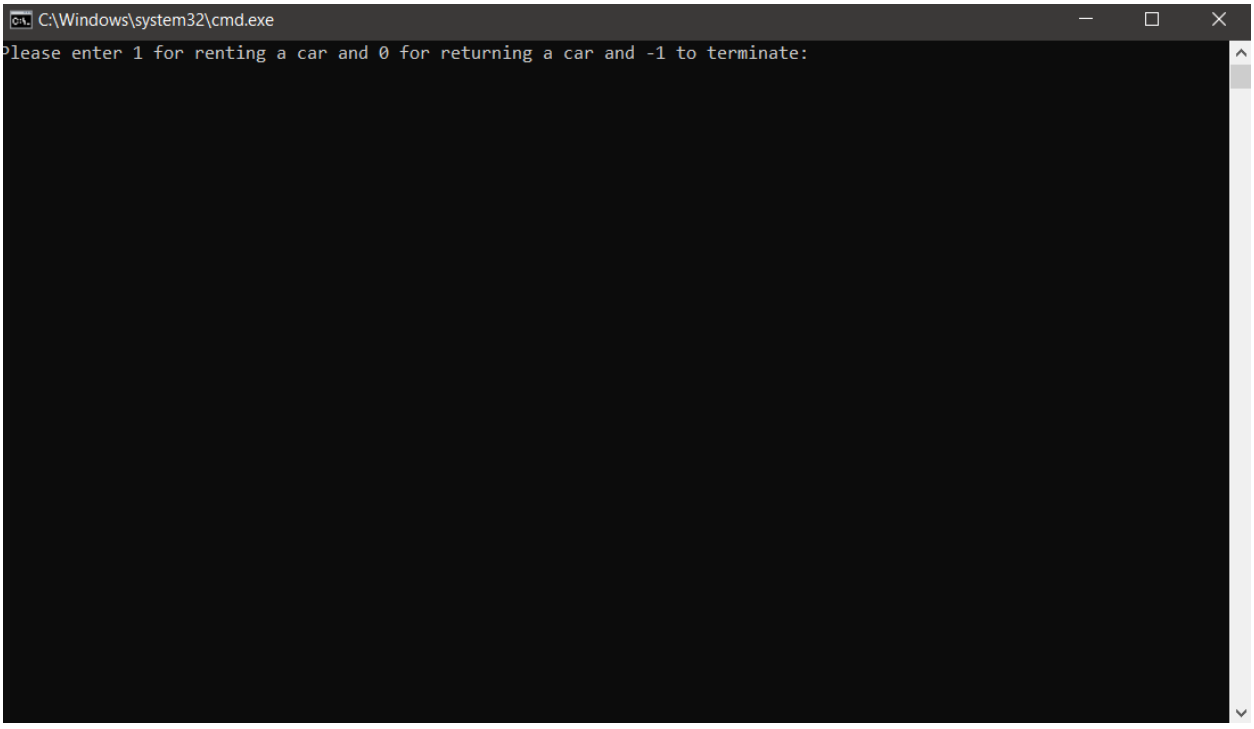
You start the application by first opening this file



After that you will see this window is opened:



You should press ctrl + f5 in order to start the program after you start the program the program will ask you whether you want to rent a car or to return a car just as shown here:



You should only choose to return a car if you have already rented a car otherwise choose to rent a car.

Let us suppose you want to rent a car:

Firstly, you will be asked to enter your full name

Secondly you will be asked to enter your age which should be above or equal to 18 otherwise the system will reject and ask you to re-enter your age.

Thirdly you will be asked to enter the car you wish to rent using the numbers before each option, For example, if you want to choose the first option you hit 1, If you want to choose the second Option you hit 2 and so on…

Fourthly you will be asked for how long do you need the car for please make sure to enter the The duration in days for example you want it for 2 months which is equal to 60 days, so gently 60 days not 2 months otherwise the bill won't be valid.

Fifthly your bill will be printed with your name and wanted car stated in table and you will be asked whether do you want to approve your request or not.

After that you will be asked again for the operation you want to do.

Picture explains how to rent a car successfully:

```
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
1
Enter your full name:
mhd omar bahra
Enter your age:
5
please enter an age that is bigger than 18: 21
please enter the number of the car you want to rent:
1.Hyundai Accent 2018
2.Hyundai Accent 2017
3.Hyundai Accent 2015
4.Fiat Doblo 2018
5.Fiat Doblo 2016
1
For how long do you need the car(in days) 365 days = 1 year:
60

-------------------------------------bill-----------------------------------------
ID      Name                    Age     Car                     Duration        priceperday
5020    mhd omar bahra          21      Hyundai Accent          60              25
total is: 1500
Do you approve?y or n
y
Inserted
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
```

let's suppose now you want to Return a car:

when you want to return a car you will press 0. After that you will be asked to input

The id that was given to you through the bill after you enter your id we will check if the rent was

Made or not before if it was made, congrats your car was returned successfully otherwise an error

Statement will be printed to the screen telling you about the problem.

A picture explains how to return a car:

```
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
0
please enter your ID: 4
Rent is not existed.
```

Let us enter a valid rent:

```
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
0
please enter your ID: 5020
You car is returned.
Please enter 1 for renting a car and 0 for returning a car and -1 to terminate:
```

And as you see you will be asked after each operation about your next operation.

Exiting the program:

Easily by typing -1 when you are asked for your next operation.