Car Rental Management

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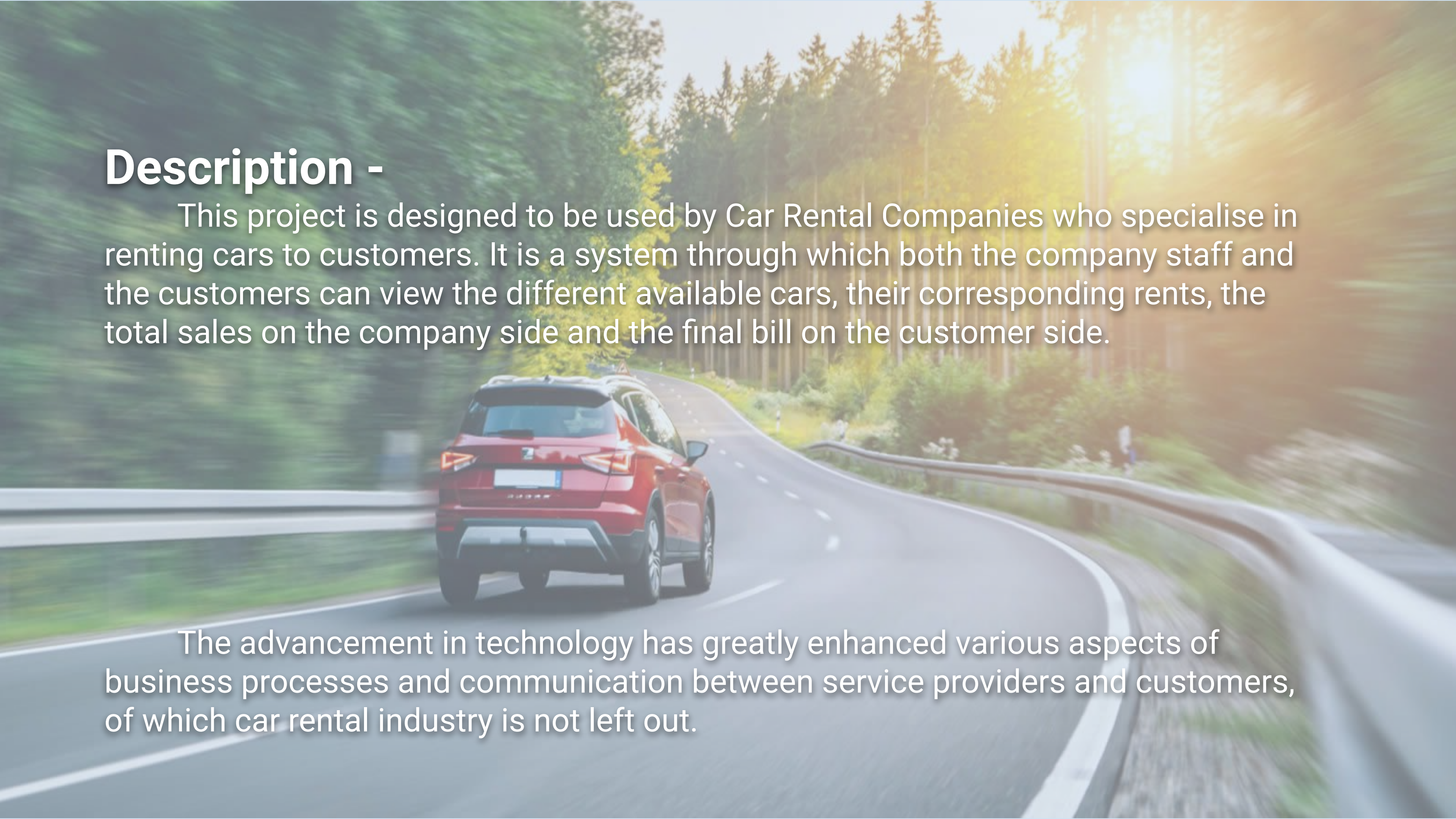
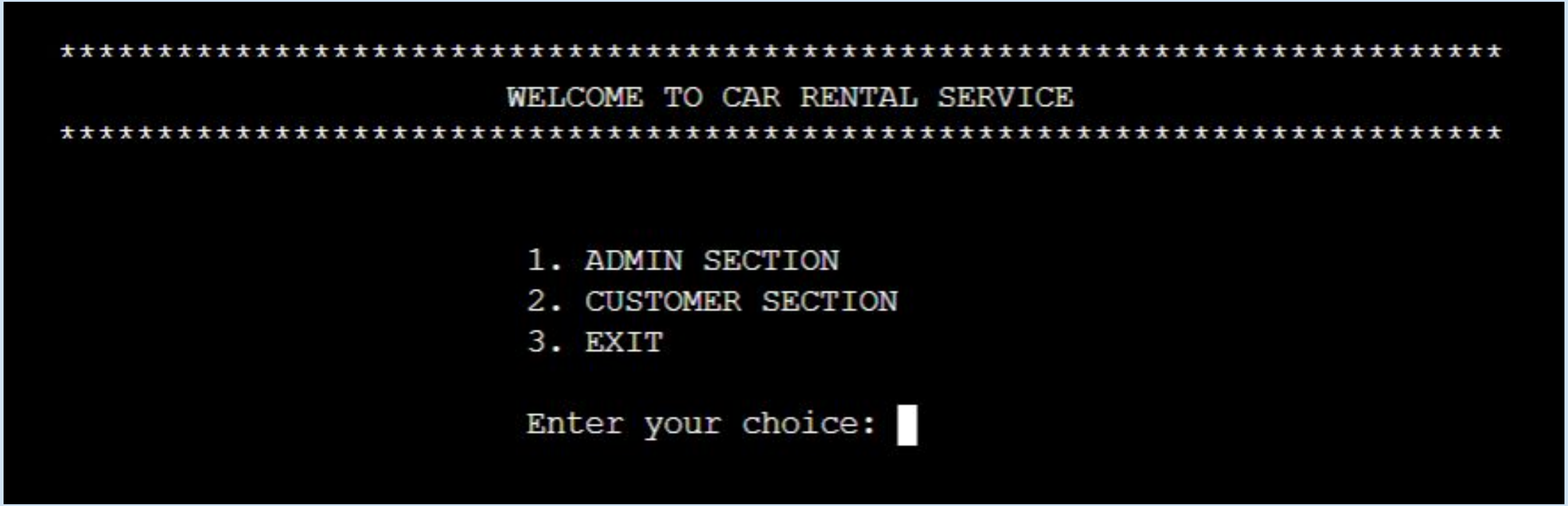


Description -

This project is designed to be used by Car Rental Companies who specialise in renting cars to customers. It is a system through which both the company staff and the customers can view the different available cars, their corresponding rents, the total sales on the company side and the final bill on the customer side.

The advancement in technology has greatly enhanced various aspects of business processes and communication between service providers and customers, of which car rental industry is not left out.

KEY FEATURE OF CAR RENTAL MANAGEMENT SYSTEM:



```
*********************************************************************************
                        WELCOME TO CAR RENTAL SERVICE
*********************************************************************************



                          1. ADMIN SECTION
                          2. CUSTOMER SECTION
                          3. EXIT

                          Enter your choice:
```

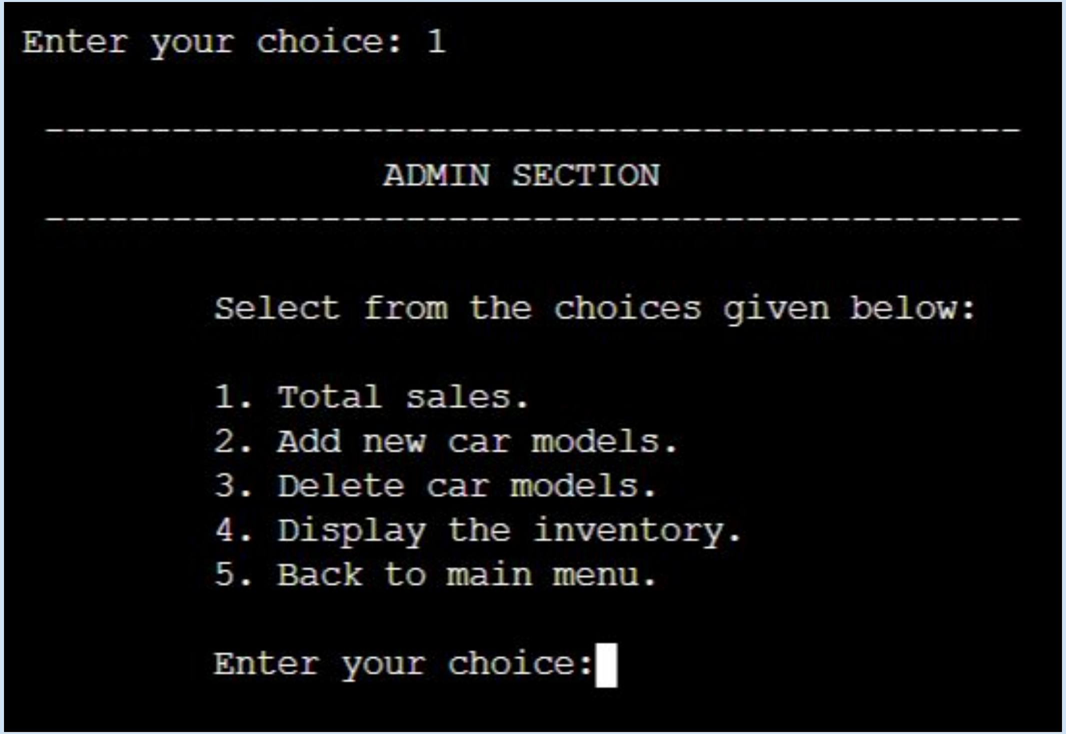
1. ADMIN SECTION

1.1 Add New Car Models

1.2 Delete Car Models

1.3 View the Inventory

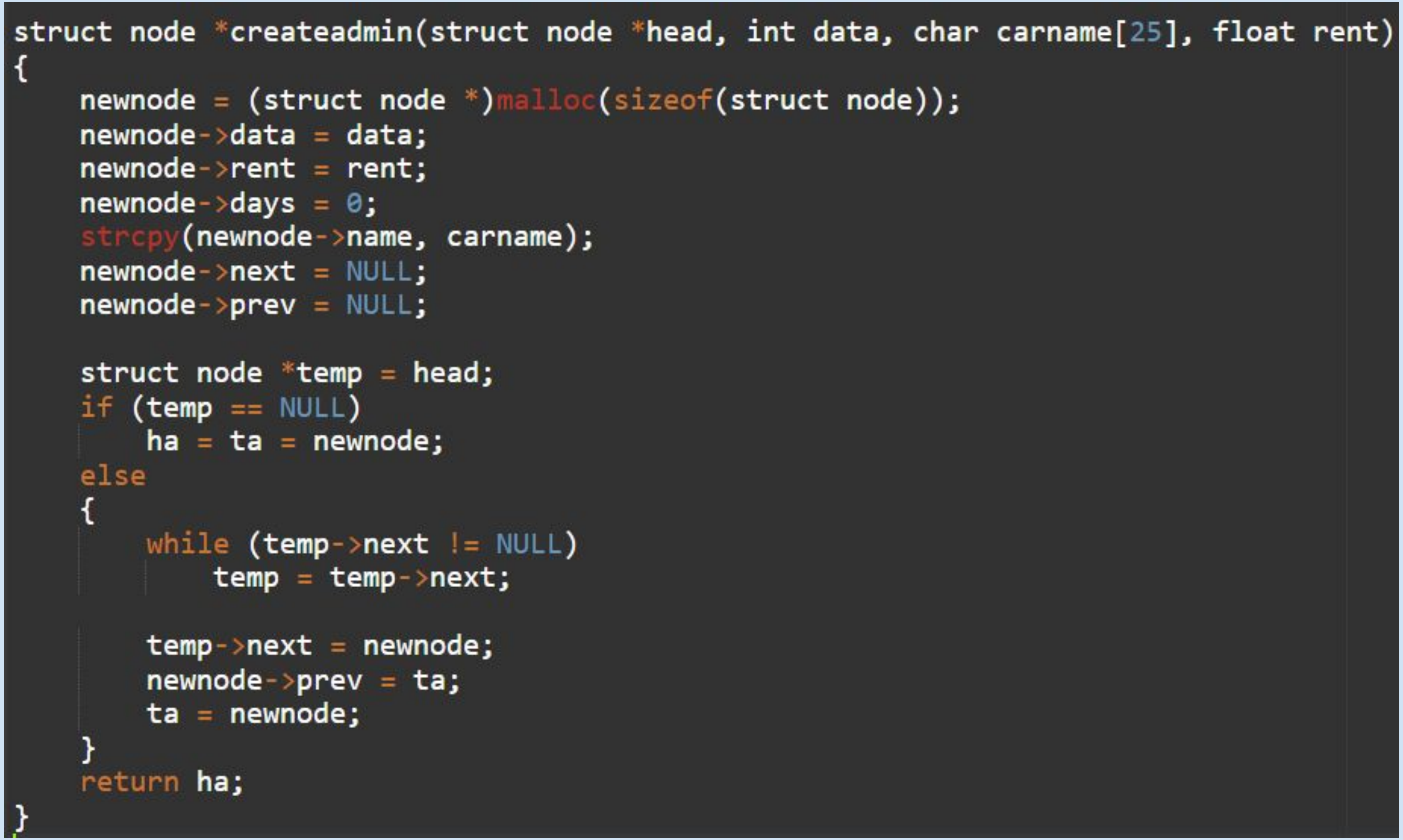
1.4 View Total Sales



```
Enter your choice: 1

 ------------------------------------------------------------

                         ADMIN SECTION

 ------------------------------------------------------------

           Select from the choices given below:

           1. Total sales.
           2. Add new car models.
           3. Delete car models.
           4. Display the inventory.
           5. Back to main menu.

           Enter your choice:
```

1.1 ADD NEW CAR MODELS

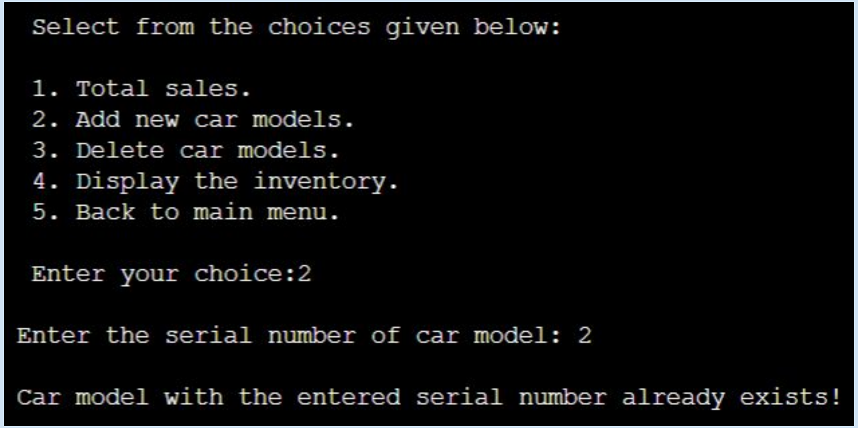
Logic :



```c
struct node *createadmin(struct node *head, int data, char carname[25], float rent)
{
    newnode = (struct node *)malloc(sizeof(struct node));
    newnode->data = data;
    newnode->rent = rent;
    newnode->days = 0;
    strcpy(newnode->name, carname);
    newnode->next = NULL;
    newnode->prev = NULL;

    struct node *temp = head;
    if (temp == NULL)
        ha = ta = newnode;
    else
    {
        while (temp->next != NULL)
            temp = temp->next;

        temp->next = newnode;
        newnode->prev = ta;
        ta = newnode;
    }
    return ha;
}
```

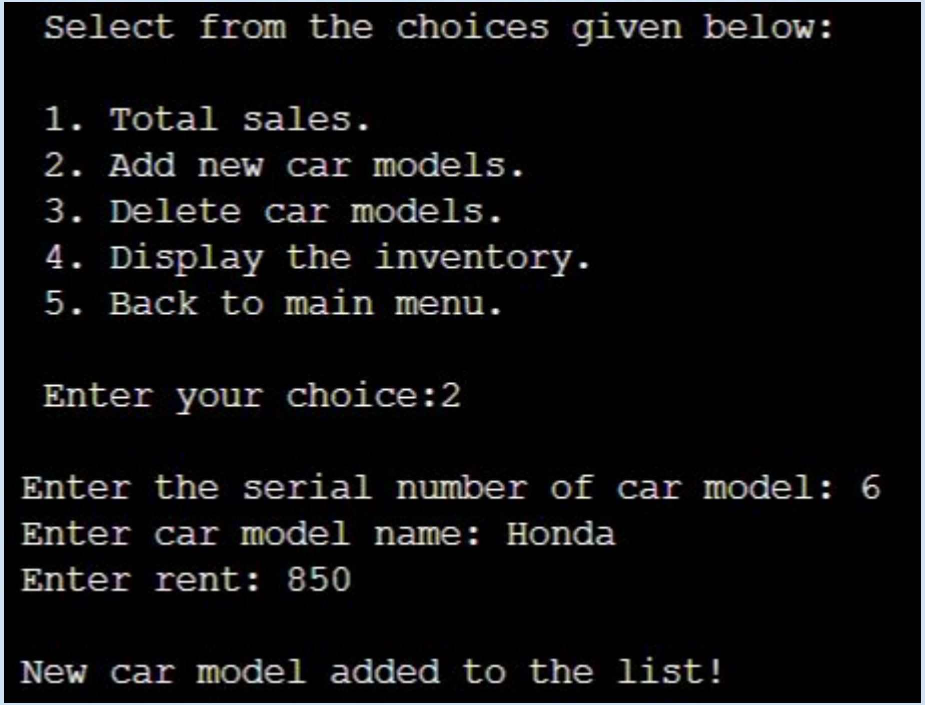
OUTPUT:

In case a car with the input serial number already exists :



```
 Select from the choices given below:

 1. Total sales.
 2. Add new car models.
 3. Delete car models.
 4. Display the inventory.
 5. Back to main menu.

 Enter your choice:2

Enter the serial number of car model: 2

Car model with the entered serial number already exists!
```

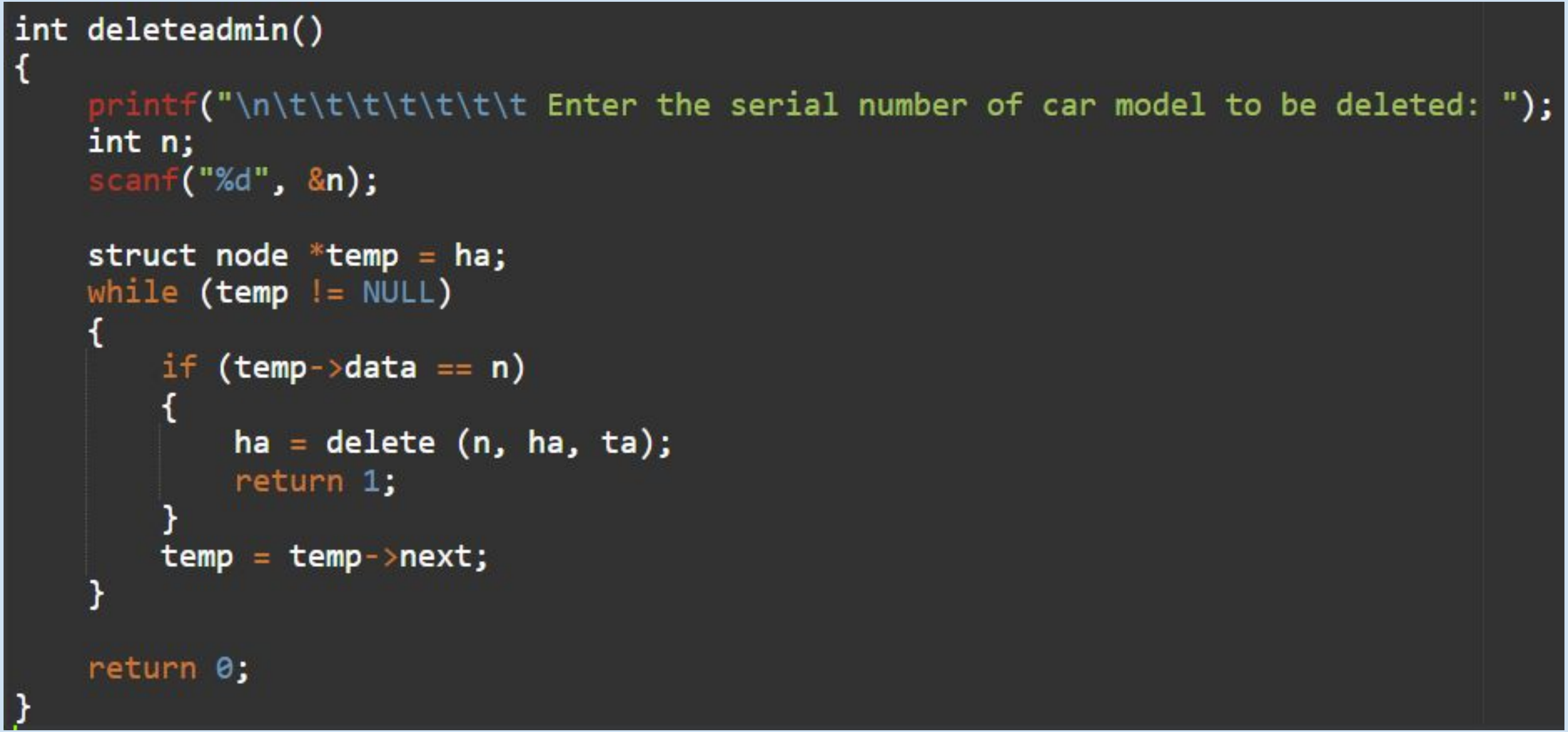
Adding a new car to the list:



```
 Select from the choices given below:

 1. Total sales.
 2. Add new car models.
 3. Delete car models.
 4. Display the inventory.
 5. Back to main menu.

 Enter your choice:2

Enter the serial number of car model: 6
Enter car model name: Honda
Enter rent: 850

New car model added to the list!
```

1.2 Deleting Cars from the List

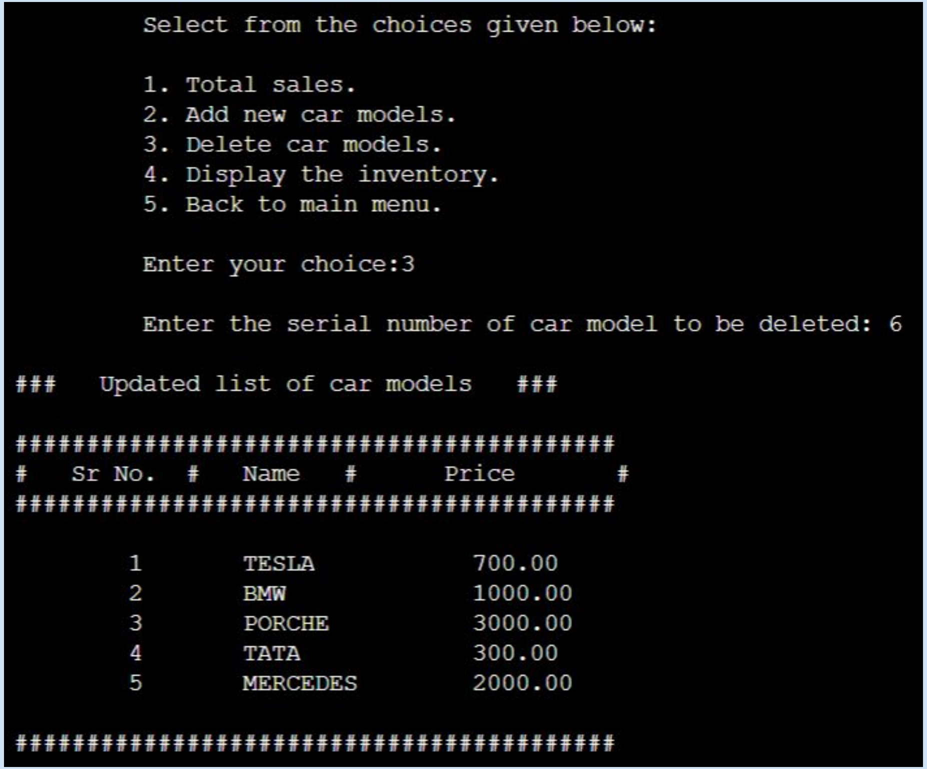
Logic :



```c
int deleteadmin()
{
    printf("\n\t\t\t\t\t\t\t Enter the serial number of car model to be deleted: ");
    int n;
    scanf("%d", &n);

    struct node *temp = ha;
    while (temp != NULL)
    {
        if (temp->data == n)
        {
            ha = delete (n, ha, ta);
            return 1;
        }
        temp = temp->next;
    }

    return 0;
}
```

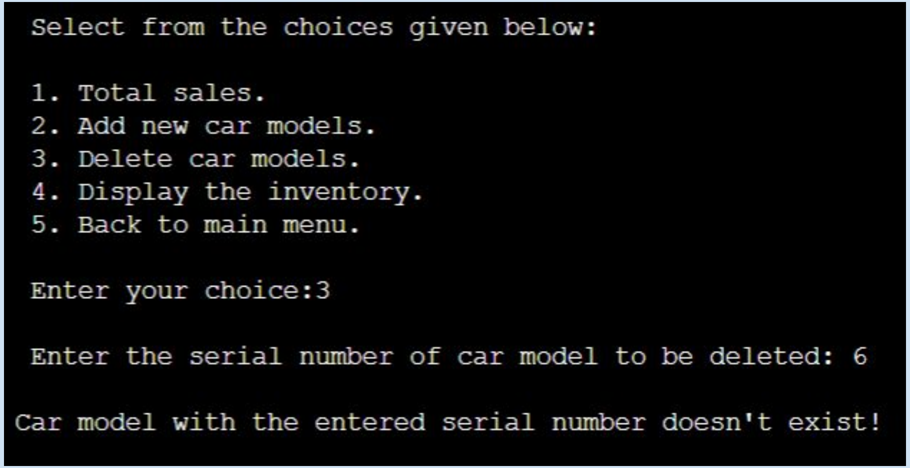
OUTPUT:

Deleting an existing Car from the Rental List:



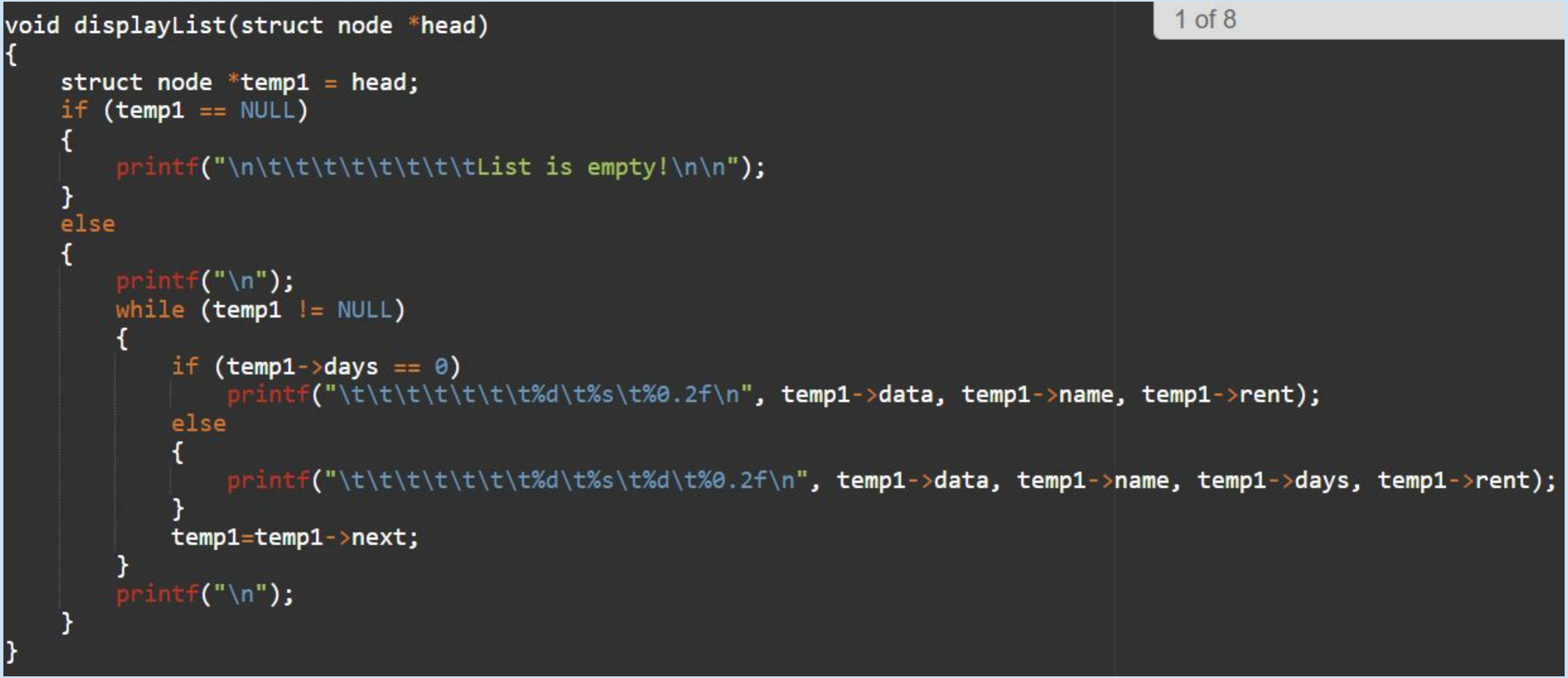
```
         Select from the choices given below:

         1. Total sales.
         2. Add new car models.
         3. Delete car models.
         4. Display the inventory.
         5. Back to main menu.

         Enter your choice:3

         Enter the serial number of car model to be deleted: 6

###   Updated list of car models   ###

##########################################
#   Sr No.  #   Name   #      Price      #
##########################################

        1       TESLA           700.00
        2       BMW             1000.00
        3       PORCHE          3000.00
        4       TATA            300.00
        5       MERCEDES        2000.00

##########################################
```

In case the entered Car is not in the List:



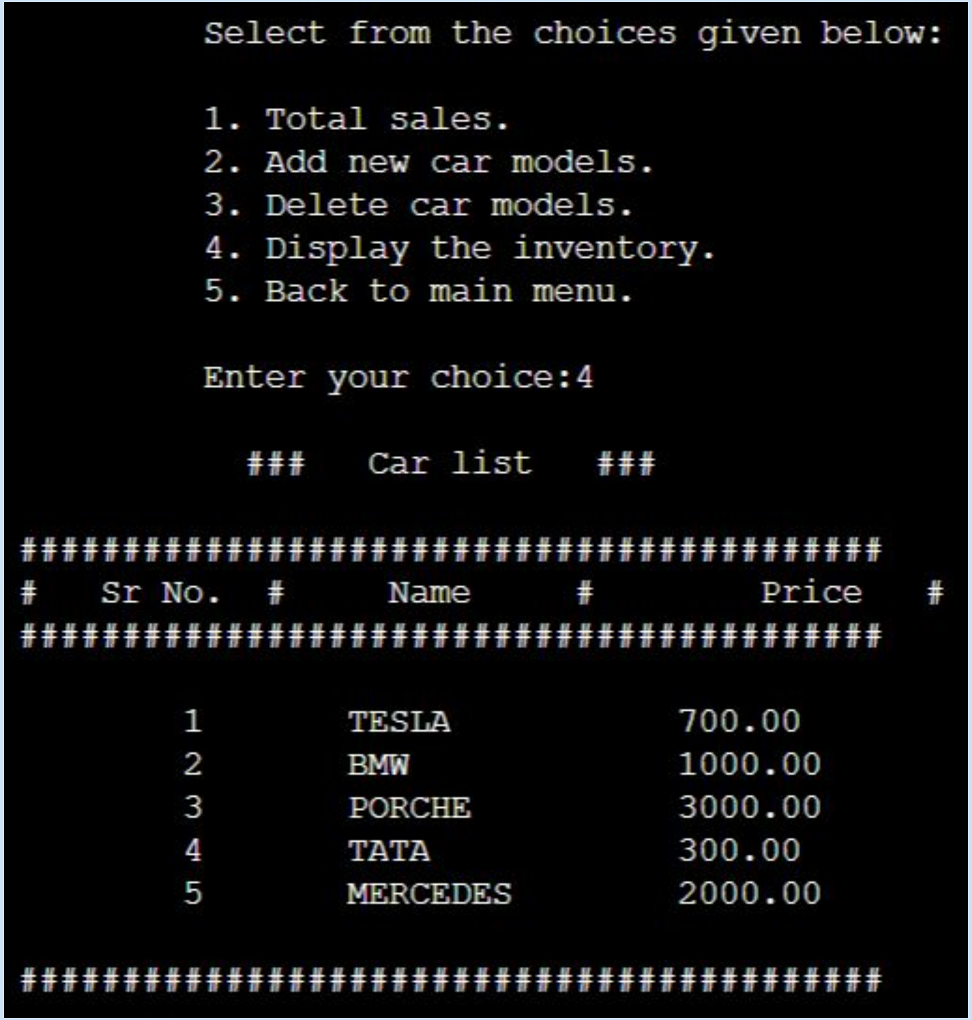
```
 Select from the choices given below:

 1. Total sales.
 2. Add new car models.
 3. Delete car models.
 4. Display the inventory.
 5. Back to main menu.

 Enter your choice:3

 Enter the serial number of car model to be deleted: 6

Car model with the entered serial number doesn't exist!
```

1.3 View the Inventory
Logic :



```c
void displayList(struct node *head)
{
    struct node *temp1 = head;
    if (temp1 == NULL)
    {
        printf("\n\t\t\t\t\t\t\t\tList is empty!\n\n");
    }
    else
    {
        printf("\n");
        while (temp1 != NULL)
        {
            if (temp1->days == 0)
                printf("\t\t\t\t\t\t\t%d\t%s\t%0.2f\n", temp1->data, temp1->name, temp1->rent);
            else
            {
                printf("\t\t\t\t\t\t\t%d\t%s\t%d\t%0.2f\n", temp1->data, temp1->name, temp1->days, temp1->rent);
            }
            temp1=temp1->next;
        }
        printf("\n");
    }
}
```

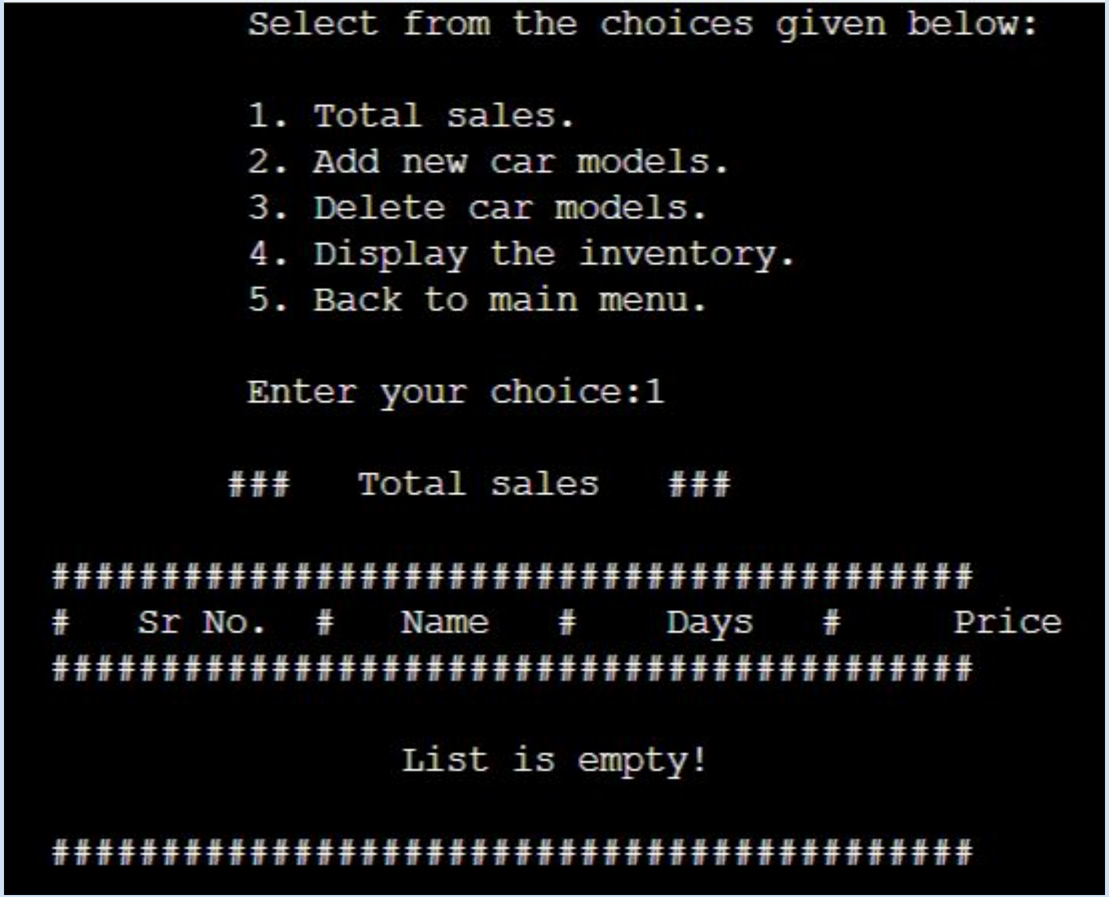
OUTPUT :



```
         Select from the choices given below:

         1. Total sales.
         2. Add new car models.
         3. Delete car models.
         4. Display the inventory.
         5. Back to main menu.

         Enter your choice:4

           ###   Car list   ###

##########################################
#   Sr No.  #     Name     #        Price   #
##########################################

        1       TESLA           700.00
        2       BMW             1000.00
        3       PORCHE          3000.00
        4       TATA            300.00
        5       MERCEDES        2000.00

##########################################
```

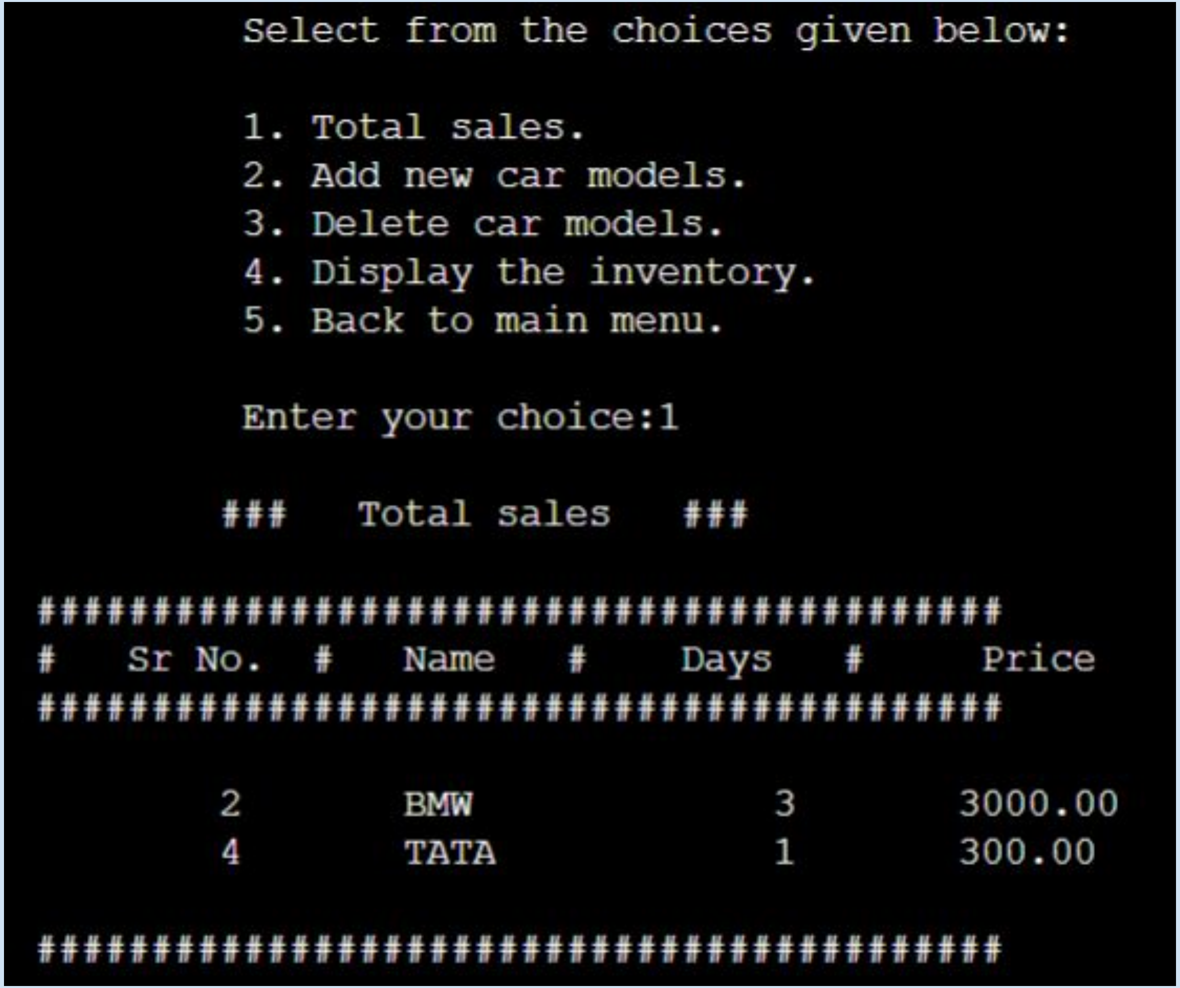
1.4 View Total Sales

At first, when no customer has reserved any Car :



```
         Select from the choices given below:

         1. Total sales.
         2. Add new car models.
         3. Delete car models.
         4. Display the inventory.
         5. Back to main menu.

         Enter your choice:1

        ###   Total sales   ###

##########################################
#   Sr No.  #   Name   #    Days   #     Price
##########################################

                List is empty!

##########################################
```

After customers have rented Cars :



```
         Select from the choices given below:

         1. Total sales.
         2. Add new car models.
         3. Delete car models.
         4. Display the inventory.
         5. Back to main menu.

         Enter your choice:1

        ###   Total sales   ###

###########################################
#   Sr No.  #   Name   #    Days   #     Price
###########################################

        2       BMW             3       3000.00
        4       TATA            1       300.00

###########################################
```

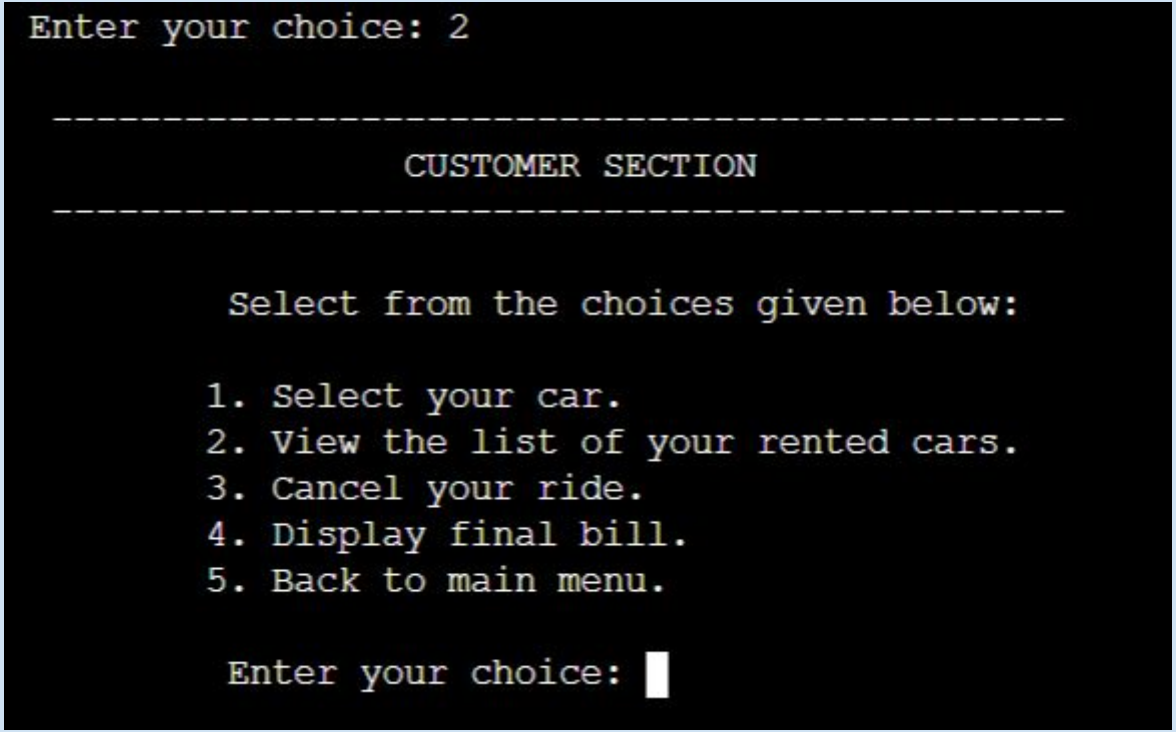
2. CUSTOMER SECTION

2.1 Select Car to Rent

2.2 View the Selected Car(s)

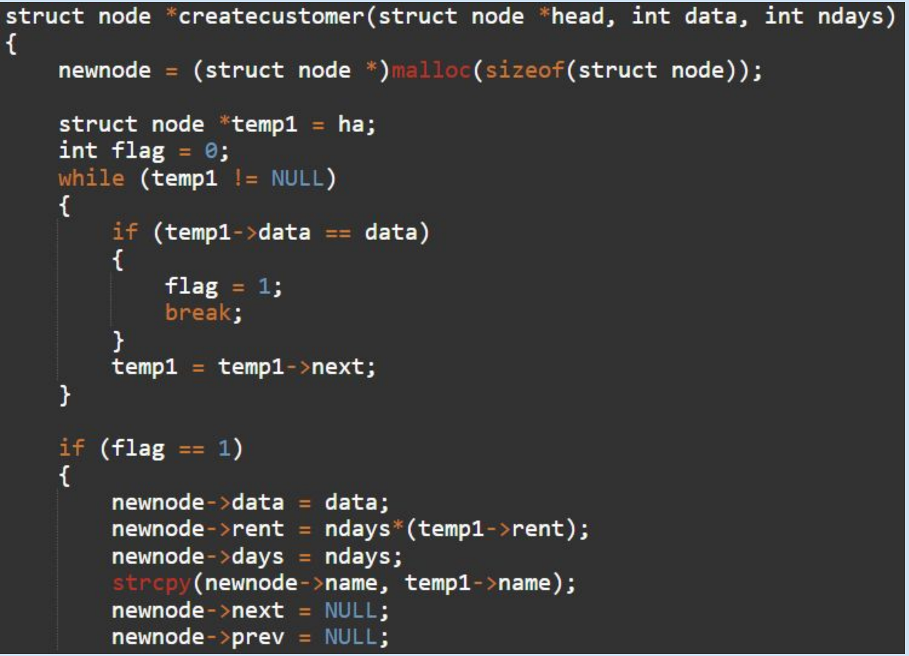
2.3 Delete reservation of a Car

2.4 Final Bill

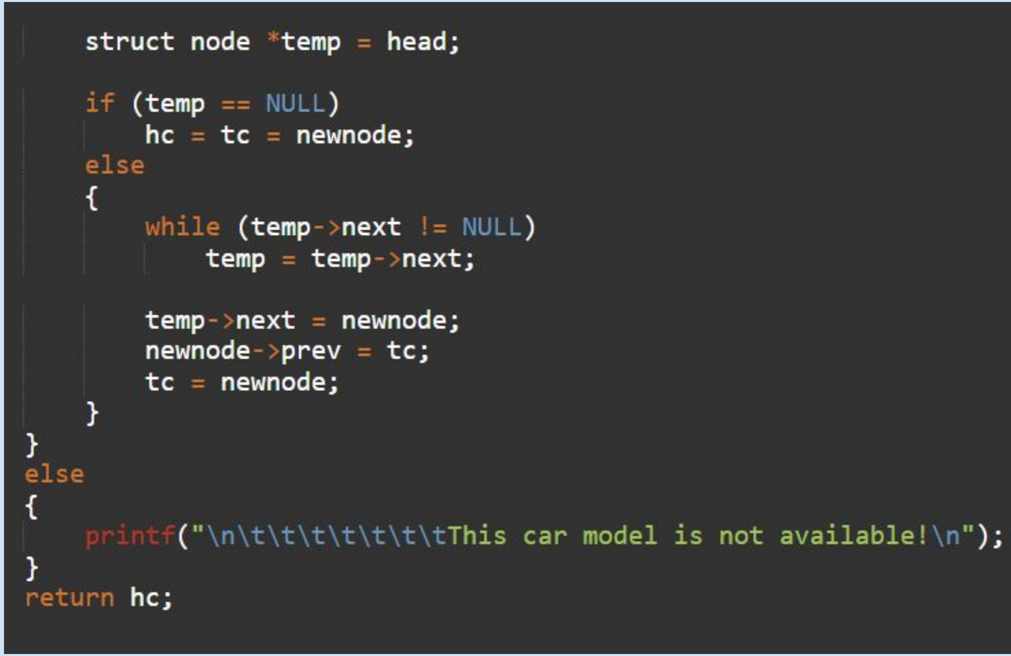


```
Enter your choice: 2

 ---------------------------------------------

                CUSTOMER SECTION

 ---------------------------------------------


         Select from the choices given below:

        1. Select your car.
        2. View the list of your rented cars.
        3. Cancel your ride.
        4. Display final bill.
        5. Back to main menu.

         Enter your choice: 
```

2.1 Selecting a Car
Logic :

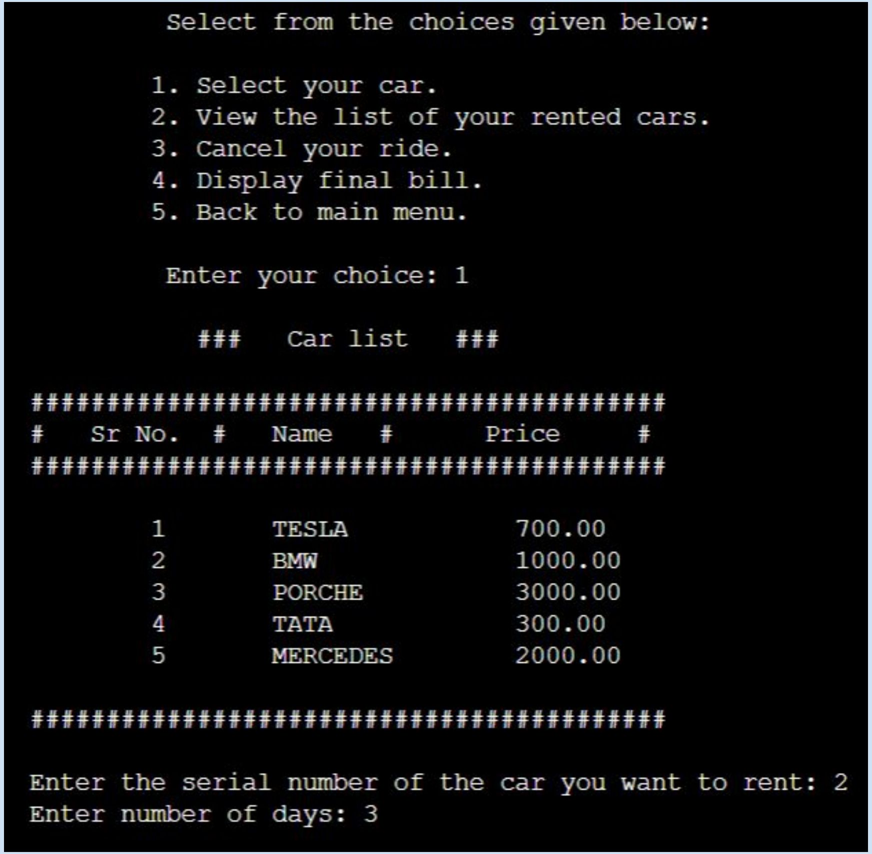


```
struct node *createcustomer(struct node *head, int data, int ndays)
{
    newnode = (struct node *)malloc(sizeof(struct node));

    struct node *temp1 = ha;
    int flag = 0;
    while (temp1 != NULL)
    {
        if (temp1->data == data)
        {
            flag = 1;
            break;
        }
        temp1 = temp1->next;
    }

    if (flag == 1)
    {
        newnode->data = data;
        newnode->rent = ndays*(temp1->rent);
        newnode->days = ndays;
        strcpy(newnode->name, temp1->name);
        newnode->next = NULL;
        newnode->prev = NULL;
```

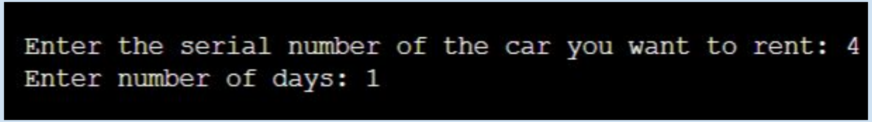


```
    struct node *temp = head;

    if (temp == NULL)
        hc = tc = newnode;
    else
    {
        while (temp->next != NULL)
            temp = temp->next;

        temp->next = newnode;
        newnode->prev = tc;
        tc = newnode;
    }
}
else
{
    printf("\n\t\t\t\t\t\t\tThis car model is not available!\n");
}
return hc;
```

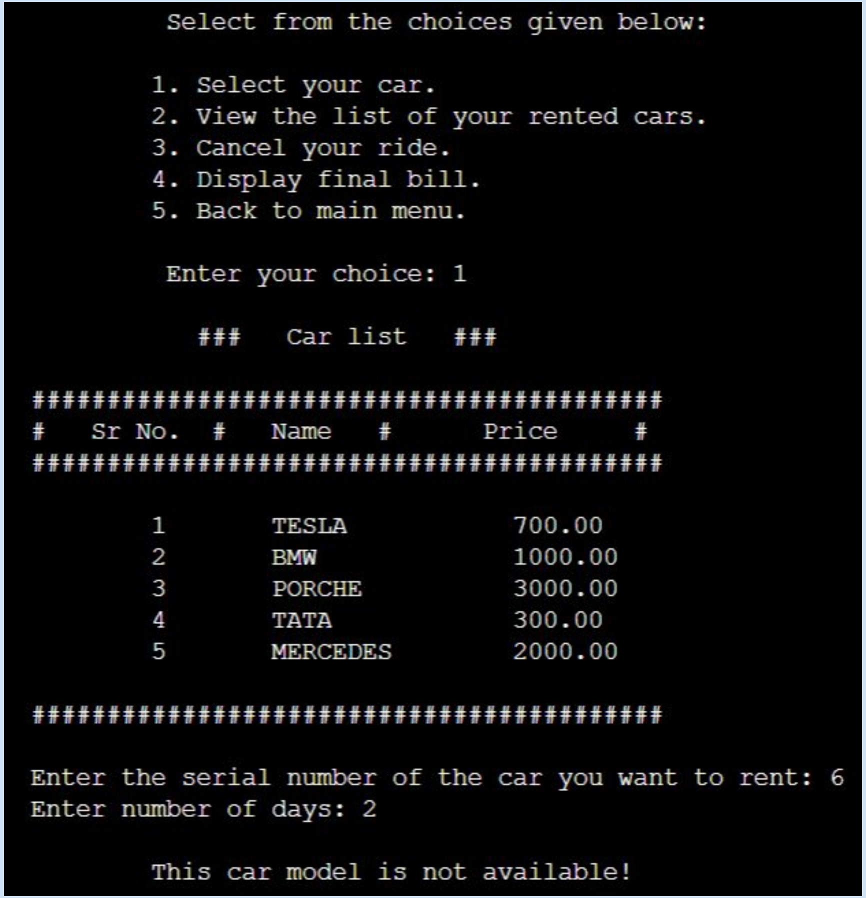
OUTPUT :



```
         Select from the choices given below:

        1. Select your car.
        2. View the list of your rented cars.
        3. Cancel your ride.
        4. Display final bill.
        5. Back to main menu.

         Enter your choice: 1

           ###   Car list   ###

##########################################
#   Sr No.  #   Name   #      Price     #
##########################################

        1       TESLA           700.00
        2       BMW             1000.00
        3       PORCHE          3000.00
        4       TATA            300.00
        5       MERCEDES        2000.00

##########################################

Enter the serial number of the car you want to rent: 2
Enter number of days: 3
```



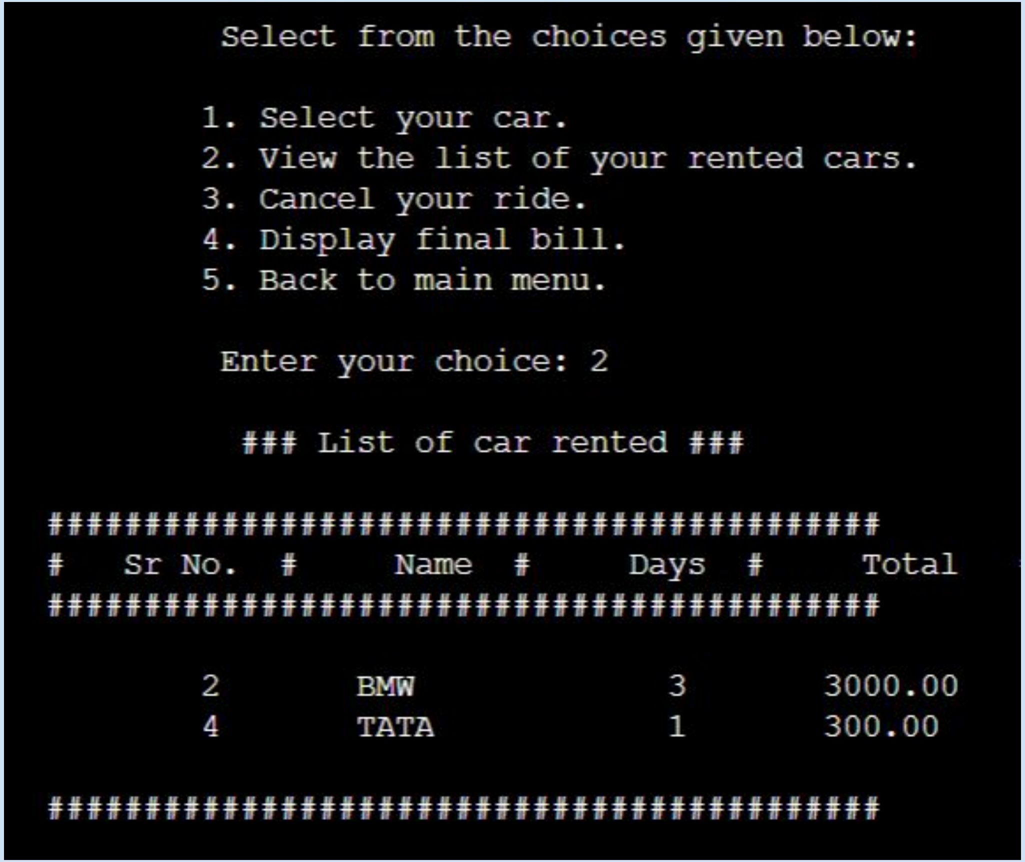
```
Enter the serial number of the car you want to rent: 4
Enter number of days: 1
```



```
         Select from the choices given below:

        1. Select your car.
        2. View the list of your rented cars.
        3. Cancel your ride.
        4. Display final bill.
        5. Back to main menu.

         Enter your choice: 1

           ###   Car list   ###

##########################################
#   Sr No.  #   Name   #      Price     #
##########################################

        1       TESLA           700.00
        2       BMW             1000.00
        3       PORCHE          3000.00
        4       TATA            300.00
        5       MERCEDES        2000.00

##########################################

Enter the serial number of the car you want to rent: 6
Enter number of days: 2

        This car model is not available!
```

2.2 View the Selected Car(s)

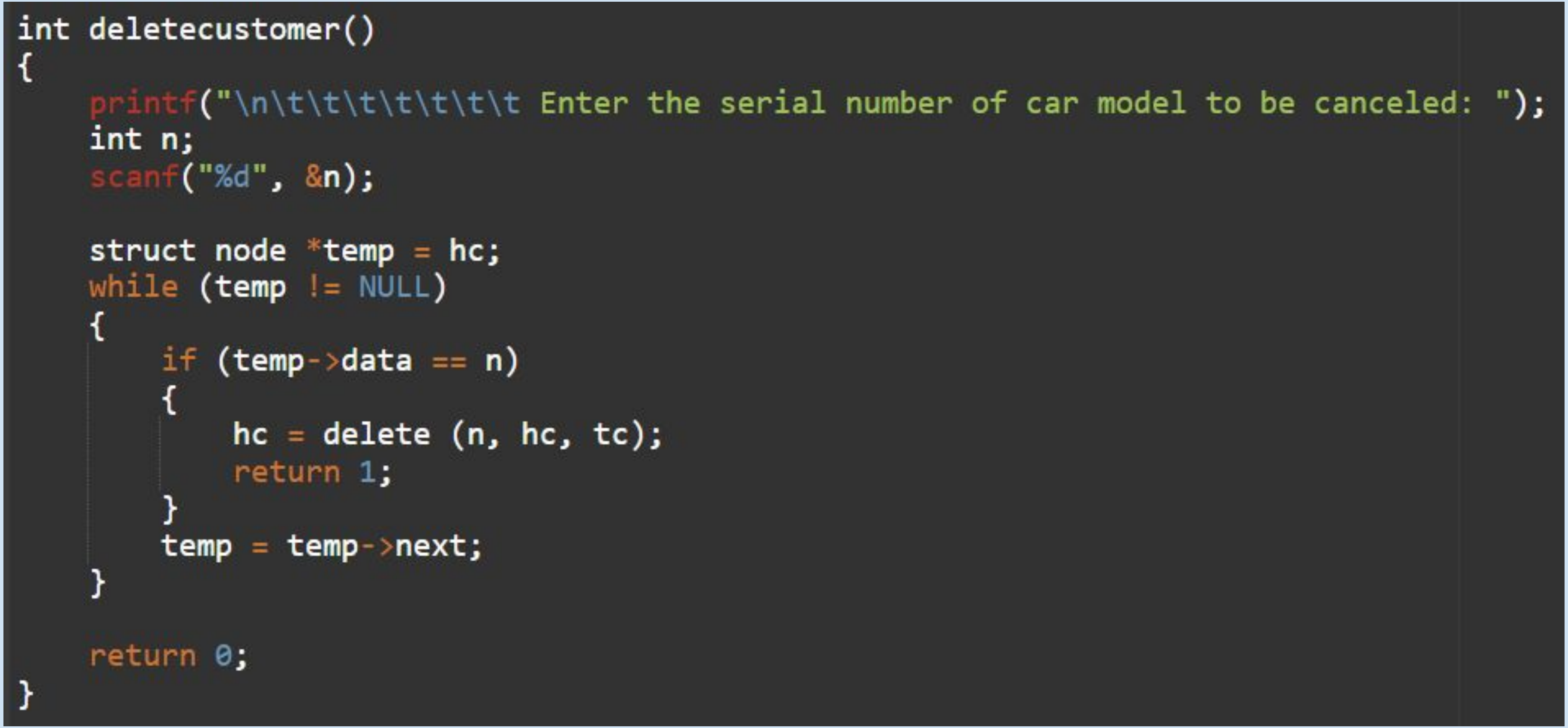
Output according to the previous inputs :



```
         Select from the choices given below:

        1. Select your car.
        2. View the list of your rented cars.
        3. Cancel your ride.
        4. Display final bill.
        5. Back to main menu.

         Enter your choice: 2

          ### List of car rented ###

###########################################
#   Sr No.  #     Name  #     Days  #     Total
###########################################


        2       BMW             3       3000.00
        4       TATA            1       300.00

###########################################
```

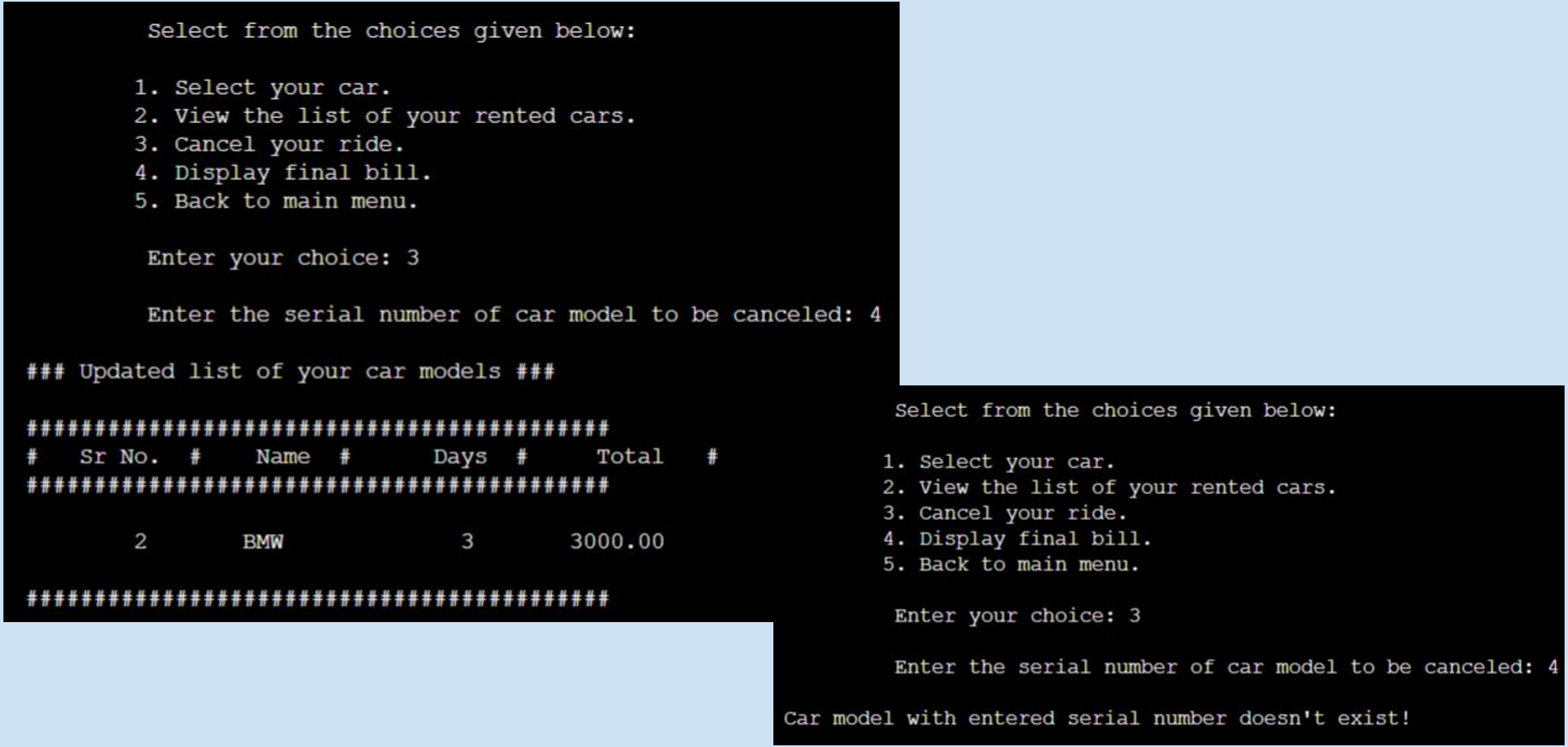
2.3 Deleting a Car Reservation

Logic :



```c
int deletecustomer()
{
    printf("\n\t\t\t\t\t\t\t Enter the serial number of car model to be canceled: ");
    int n;
    scanf("%d", &n);

    struct node *temp = hc;
    while (temp != NULL)
    {
        if (temp->data == n)
        {
            hc = delete (n, hc, tc);
            return 1;
        }
        temp = temp->next;
    }

    return 0;
}
```

OUTPUT :

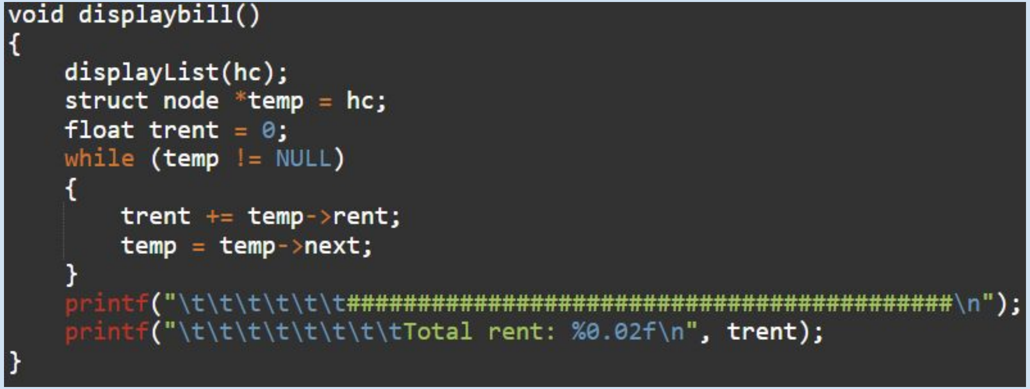


```
          Select from the choices given below:

         1. Select your car.
         2. View the list of your rented cars.
         3. Cancel your ride.
         4. Display final bill.
         5. Back to main menu.

          Enter your choice: 3

          Enter the serial number of car model to be canceled: 4

### Updated list of your car models ###

###########################################
#   Sr No.  #    Name  #      Days  #     Total    #
###########################################


         2       BMW             3       3000.00

###########################################
```

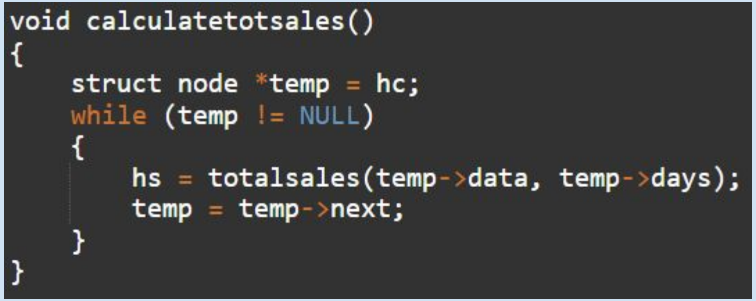
```
          Select from the choices given below:

         1. Select your car.
         2. View the list of your rented cars.
         3. Cancel your ride.
         4. Display final bill.
         5. Back to main menu.

          Enter your choice: 3

          Enter the serial number of car model to be canceled: 4

Car model with entered serial number doesn't exist!
```

2.4 Final Bill

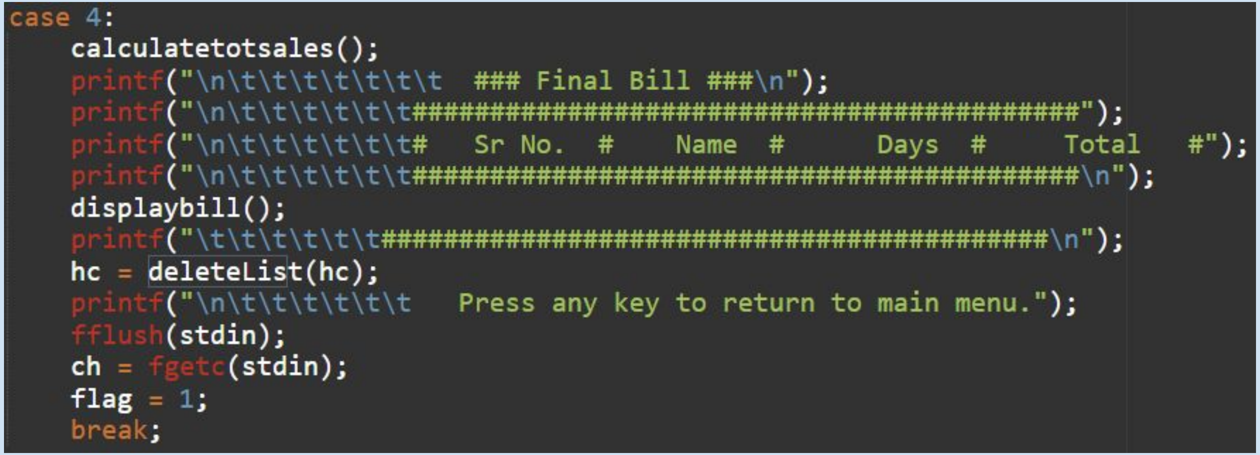
Logic :



```c
void displaybill()
{
    displayList(hc);
    struct node *temp = hc;
    float trent = 0;
    while (temp != NULL)
    {
        trent += temp->rent;
        temp = temp->next;
    }
    printf("\t\t\t\t\t\t###########################################\n");
    printf("\t\t\t\t\t\t\t\tTotal rent: %0.02f\n", trent);
}
```

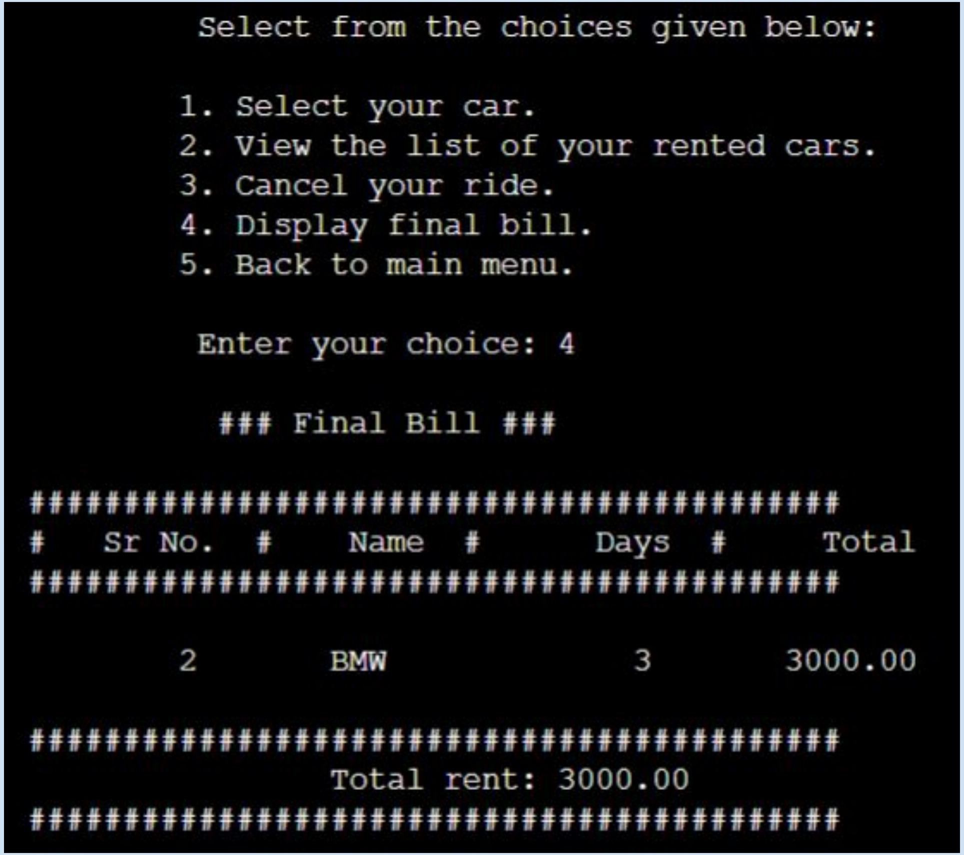


```c
void calculatetotsales()
{
    struct node *temp = hc;
    while (temp != NULL)
    {
        hs = totalsales(temp->data, temp->days);
        temp = temp->next;
    }
}
```



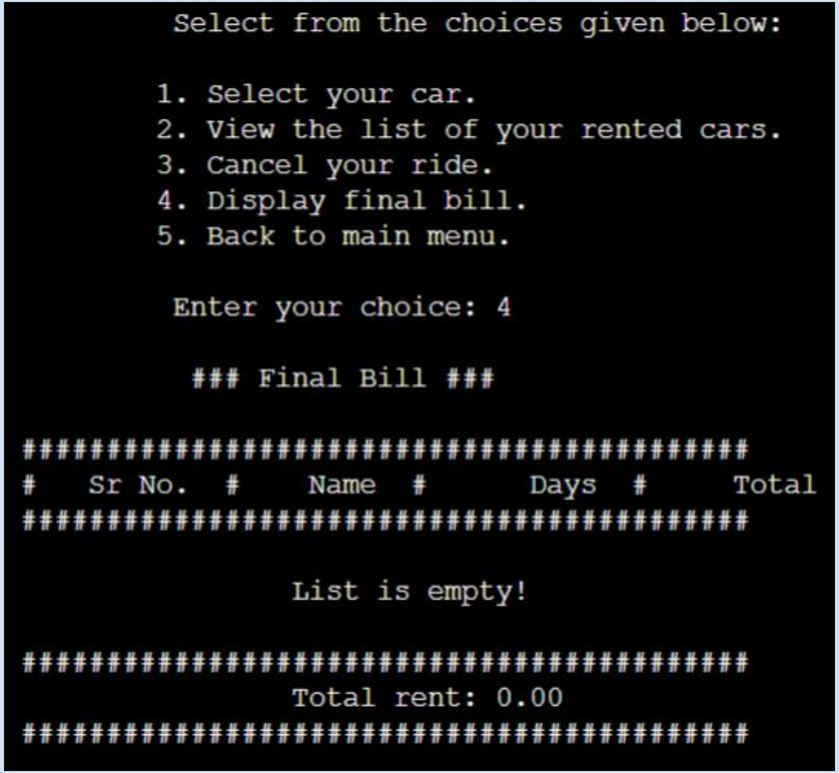
```c
case 4:
    calculatetotsales();
    printf("\n\t\t\t\t\t\t\t  ### Final Bill ###\n");
    printf("\n\t\t\t\t\t\t###########################################");
    printf("\n\t\t\t\t\t\t#   Sr No.  #    Name  #      Days  #     Total   #");
    printf("\n\t\t\t\t\t\t###########################################\n");
    displaybill();
    printf("\t\t\t\t\t\t###########################################\n");
    hc = deleteList(hc);
    printf("\n\t\t\t\t\t\t   Press any key to return to main menu.");
    fflush(stdin);
    ch = fgetc(stdin);
    flag = 1;
    break;
```

OUTPUT :



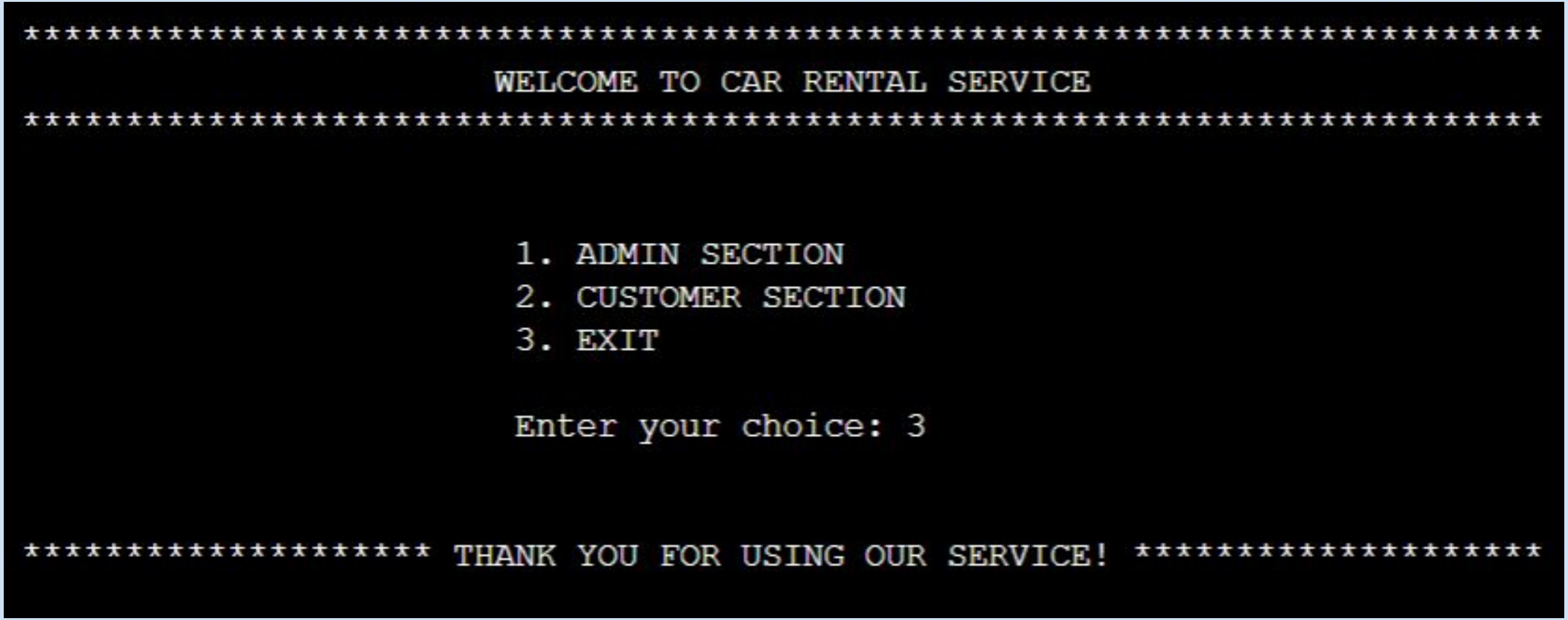
```
          Select from the choices given below:

         1. Select your car.
         2. View the list of your rented cars.
         3. Cancel your ride.
         4. Display final bill.
         5. Back to main menu.

          Enter your choice: 4

           ### Final Bill ###

###########################################
#   Sr No.  #     Name  #       Days  #      Total
###########################################


       2        BMW               3        3000.00

###########################################
                 Total rent: 3000.00
###########################################
```

If no Car is selected by the customer :



```
          Select from the choices given below:

         1. Select your car.
         2. View the list of your rented cars.
         3. Cancel your ride.
         4. Display final bill.
         5. Back to main menu.

          Enter your choice: 4

           ### Final Bill ###

###########################################
#   Sr No.  #     Name  #       Days  #      Total
###########################################

                  List is empty!

###########################################
                  Total rent: 0.00
###########################################
```

3. EXITING OUR SYSTEM :



```
**************************************************************************
                       WELCOME TO CAR RENTAL SERVICE
**************************************************************************




                        1. ADMIN SECTION
                        2. CUSTOMER SECTION
                        3. EXIT

                        Enter your choice: 3



******************** THANK YOU FOR USING OUR SERVICE! ********************
```

Data Structure used and Time complexity

- In this program we have used Linked list.In this code the data structure we have used is linked list, linked list is a dynamic type of data structure i.e data elements are not stored in contiguous memory locations. The data elements are called nodes. Each node contains a data field which stores the data and a reference field which contains the address of next node.

- Let the length of the linked list be n, then for a particular choice of the user the worst case time complexity will be O(n) because of linear search or traversing through the linked list.