```
run:
    WELCOME!
*******************
1. Enter the Details of the Police Officer.
2. Enter the Car's Details
3. Make Calculation and Check Parked Car Status
4. Display
5. Exit
*********************
Please the enter the number '1' '2' '3' '4' '5' :1
***************************
Sign up for Duty.
***************************
Enter the Name of the Police Officer
Taz
Enter the Badge Number of the Police Officer
123456


Now there are 1 Police Officer in the System


Taz is Police Officer Number 1


*******************
1. Enter the Details of the Police Officer.
2. Enter the Car's Details
3. Make Calculation and Check Parked Car Status
4. Display
```

```
5. Exit
*********************
Please the enter the number '1' '2' '3' '4' '5' :2
Which Police Officer Number are you? Please enter the N
1
Police Officer 1 is on duty now

Enter How many car is there.
2
What is the Car Make of Car Number 1?
Toyota
What is the Car Model of Car Number 1?
1998
What is the Car Colour of Car Number 1?
Red
What is the Car Registration of Car Number 1?
DSSD334
How many Minutes was the Car Number 1 Parked?
300
Enter the Purchased Parking Time
150
What is the Car Make of Car Number 2?
Nissan
What is the Car Model of Car Number 2?
2008
What is the Car Colour of Car Number 2?
Blue
```

```
What is the Car Registration of Car Number 2?
SDSDS9898
How many Minutes was the Car Number 2 Parked?
200
Enter the Purchased Parking Time
100
*******************
1. Enter the Details of the Police Officer.
2. Enter the Car's Details
3. Make Calculation and Check Parked Car Status
4. Display
5. Exit
*********************
Please the enter the number '1' '2' '3' '4' '5' :3
The number of '✔' shows the number of Parking Tickets that have created.

✔
✔

Please Select Option '4' to Display the Information.

*******************
1. Enter the Details of the Police Officer.
2. Enter the Car's Details
3. Make Calculation and Check Parked Car Status
4. Display
5. Exit
```

```
*********************
Please the enter the number '1' '2' '3' '4' '5' :4
Option '4' have been Selected


*************************************************************

*********INFORMATION ON THE ILLEGALLY PARKED CAR(S)*********
The Number of Minutes the Car was Parked
300

*********************
THE DETAILS OF THE CAR
*********************


The Car Maker is Toyota
The Model of the Car is 1998
The Colour of the Car is Red
The Registration of the Car is DSSD334


*********THE DETAILS OF THE POLICE OFFICER*********
The Officer Name is
Taz
The Badge Number of the Officer is
123456
```

```
The Rate of the Fine is
250.0
************************************************************

Purchased Parking Time is
150
************************************************************

*********INFORMATION ON THE ILLEGALLY PARKED CAR(S)*********
The Number of Minutes the Car was Parked
200

*********************
THE DETAILS OF THE CAR
*********************

The Car Maker is Nissan
The Model of the Car is 2008
The Colour of the Car is Blue
The Registration of the Car is SDSDS9898

*********THE DETAILS OF THE POLICE OFFICER*********
The Officer Name is
Taz
The Badge Number of the Officer is
123456
```

```
The Rate of the Fine is
200.0
************************************************************

Purchased Parking Time is
100
*******************
1. Enter the Details of the Police Officer.
2. Enter the Car's Details
3. Make Calculation and Check Parked Car Status
4. Display
5. Exit
*********************
Please the enter the number '1' '2' '3' '4' '5' :
```

```java
//Student's Full Name- Tasfique Enam

//Student's ID- J16020825/5886429

//Modification Date 16/04/2019

//Purpose of this file- Main Class

package assignment1;


import java.util.ArrayList;

import java.util.Iterator;

import java.util.Scanner;


public class Main {


    public static void main(String[] args) {

        Scanner read = new Scanner(System.in); //scanner for reading input from the user.

        int PoliceSelector= 1;

        int option;

        int carNumbers;

       // PoliceOfficer policeObj = new PoliceOfficer(); //policeofficer object

        //ParkedCar parkedCarObj = new ParkedCar();

        //

        ParkingMeter [] AryObjParkingMeter = null; // (it was at down) this is an array object to store
purchased parking ticket.

        ParkedCar [] AryObjParkingLot = null; //an array object to store the car's information like car
name, registration, color etc...

        ArrayList<PoliceOfficer> policeList = new ArrayList<>(); //police officer array list

        ArrayList<ParkingTicket> parkingTicketList = new ArrayList<>(); //parking ticket array list.

        ArrayList<ParkingMeter> parkingMeterList = new ArrayList<>();




        //entering name of the police officer and their badge number.

        System.out.println("     WELCOME!");
```

```java
do{

    System.out.print("******************\n" + //display menu

                "1. Enter the Details of the Police Officer.\n" +

                "2. Enter the Car's Details\n" +

                "3. Make Calculation and Check Parked Car Status\n"+

                "4. Display\n"+

                "5. Exit\n"+

                "********************\n" +

                "Please the enter the number '1' '2' '3' '4' '5' :");

    option = read.nextInt();


switch(option) { //using switch case for selection
    case 1:
    {

        System.out.print("***************************\n");

        System.out.println("Sign up for Duty.");

        System.out.print("***************************\n");

        System.out.println("Enter the Name of the Police Officer");

        String name = read.next();

        System.out.println("Enter the Badge Number of the Police Officer");

        String badgeNumber = read.next();


            PoliceOfficer policeObj = new PoliceOfficer(); //policeofficer object


        //putting the input into the object.

        policeObj.setOfficerName(name);

        policeObj.setBadgeNumber(badgeNumber);

        policeList.add(policeObj); //adding the police object into array list.


        System.out.print("\nNow there are "+policeList.size()+" Police Officer in the System\n
");//keep track of how many police officer in the system
```

```java
        System.out.println("\n"+name+" is Police Officer Number "+policeList.size()+"\n");


        break;
    }


    case 2:
    {
        System.out.println("Which Police Officer Number are you? Please enter the Number (Only One Police Officer can work at a time!)");
        PoliceSelector = read.nextInt();


        if(policeList.size() !=0 && PoliceSelector<= policeList.size() && PoliceSelector >0) { //doing validation of wrong user input.
            policeList.get(PoliceSelector-1); // selecting from the array list of police objects, to let users select which police they want to work with, as only one police officer can work at a time.
            System.out.println("Police Officer "+PoliceSelector+" is on duty now\n");
            System.out.println("Enter How many car is there.");
            carNumbers = read.nextInt();
            AryObjParkingLot = new ParkedCar [carNumbers]; //inputting the user input into the parkingLot array
            //parked car array of object
            AryObjParkingMeter = new ParkingMeter [carNumbers]; //inputting the user input into meters array, as the Parking Car Objects needs to be stored into a specific array index that matches the parkingLot[] and meters[]
            //parking meter array of object


            for(int c=0; c<carNumbers; c++) { //using a for loop for the number of cars there are, that the user inputted.
                System.out.println("What is the Car Make of Car Number "+(c+1)+"? "); //asking for user input.
                String carMake = read.next();
                System.out.println("What is the Car Model of Car Number "+(c+1)+"? ");
                String carModel = read.next();
                System.out.println("What is the Car Colour of Car Number "+(c+1)+"? ");
```

```java
        String carColor = read.next();

        System.out.println("What is the Car Registration of Car Number "+(c+1)+"? ");

        String carReg = read.next();

        System.out.println("How many Minutes was the Car Number "+(c+1)+" Parked?");

        int minuteParkedTime = read.nextInt();


        AryObjParkingLot[c] = new ParkedCar(carMake, carModel, carColor, carReg,
minuteParkedTime);

        //inputting the user's input into the ParkedCar objects and they r put into Array with a for
loop.

        //parkingLot.(parkedCarObj);


        System.out.println("Enter the Purchased Parking Time ");

        int purchasedParkingTime = read.nextInt();


        AryObjParkingMeter[c] = new ParkingMeter(); //meter[c] is assigned to new
ParkingMeter();


        AryObjParkingMeter[c].setPurchaseParkingTime(purchasedParkingTime); //it is used like
this because it is a setter.

        //inputting the user's input into array as ParkingMeter number needs to be the same as
ParkedCar Array


    }


    }else{

    System.out.println("\n What you have selected doesn't exist in the System \n");

    }


    break;


    }
    case 3:
```

```java
{
    if(policeList.size() !=0 && AryObjParkingLot != null){ //this is a validation if the user inputs directly 3 in the system in the selection menu

        System.out.println("The number of '✔' shows the number of Parking Tickets that have created. \n");

        for(int index=0; index < AryObjParkingLot.length; index++) //using a for loop as there r more than one number of cars.
        {
            if(AryObjParkingLot[index].getMinuteParked() >

                AryObjParkingMeter[index].getPurchaseParkingTime()) //using if statement to make a comparison to see if minute parked is greater than purchased parking time
                {
                    ParkingTicket parkingTicketObj = new ParkingTicket(); //create a new object

                    ParkingMeter parkingMeterObj = new ParkingMeter();


                    parkingTicketObj.setPoliceOfficer(policeList.get(PoliceSelector-1)); //in the parkingTicketObj of the ParkingTicket class, setting the setPoliceOfficer method. policeObj contains police officer details.

                    parkingTicketObj.Calculation(AryObjParkingLot[index].getMinuteParked() - AryObjParkingMeter[index].getPurchaseParkingTime()); //accessing calculation method from the parkingTicketObj

                    parkingTicketObj.setParkedCarObj(AryObjParkingLot[index]); //accessing setParkedCarObj method to

parkingMeterObj.setPurchaseParkingTime(AryObjParkingMeter[index].getPurchaseParkingTime());



                    parkingTicketList.add(parkingTicketObj); //putting parkingTicketObj inside the Parking ticket array list.

                    parkingMeterList.add(parkingMeterObj);

                    System.out.println("✔");


                }else{

                    System.out.println("\nThere are some Legally Parked Cars, and they have been Ommited from Display. \n");
```

```java
                }
            }


        }else{
            System.out.println("\nPolice Officer or Car have not been entered into the System \n");
            System.out.println("You must Sign in as a Police Officer and Enter the Car information for
Option 3 to Process.\n");
        }


        System.out.println("\nPlease Select Option '4' to Display the Information.\n");
        break;

    }


    case 4:


    {
        System.out.println("Option '4' have been Selected\n");
        Iterator <ParkingTicket> itr = parkingTicketList.iterator(); //using itr to display all the
elements
        Iterator <ParkingMeter> itr2 = parkingMeterList.iterator();
        while(itr.hasNext()) {
            ParkingTicket element = itr.next();
            ParkingMeter element2 = itr2.next();

System.out.println("****************************************************
\n"+element);

System.out.println("****************************************************
\n"+element2);
        }


        /*Iterator <ParkingMeter> itr2 = parkingMeterList.iterator();
        while(itr2.hasNext()) {
```

```java
                ParkingMeter element2 = itr2.next();


System.out.println("****************************************************
\n"+element2);


            }*/


        break;
    }
    case 5:
    {
        option =0;
        break;
    }


    default:
    {
        System.out.println("You have selected the wrong number "); // if the user have inputted
the wrong number, in the selection menu.
        break;
    }




}


}while (option!=0);


}


}
```

```java
//Student's Full Name- Tasfique Enam

//Student's ID- J16020825/5886429

//Modification Date 16/04/2019

//Purpose of this file- Parking Ticket Class

package assignment1;

public class ParkingTicket {

    private ParkedCar parkedCarObj = new ParkedCar ();

    private double fine;

    PoliceOfficer officerObj = new PoliceOfficer ();

    public static double FIRST_HOUR_FINE_RATE = 150.00;

    public static double ADDITIONAL_HOUR_FINE_RATE = 50.00;

    public static double MAXIMUM_FINE_RATE = 300.00;


    public ParkingTicket() { //default constructor

        parkedCarObj = null;

        fine = 0.0;

        officerObj = null;

    }


    public ParkingTicket(ParkedCar parkedCarObj, double fine, PoliceOfficer officerObj) { //non default
constructor

        this.parkedCarObj = parkedCarObj;

        this.fine = fine;

        this.officerObj = officerObj;

    }


    public void setParkedCarObj (ParkedCar parkedCarObj) { //setter methods.

        this.parkedCarObj = parkedCarObj;

    }
```

```java
public void setFine (double fine) {

    this.fine = fine;

}


public void setPoliceOfficer (PoliceOfficer officerObj) {

    this.officerObj = officerObj;

}


public ParkedCar getParkedCarObj () { //getter methods.

    return parkedCarObj;

}


public double getFine () {

    return fine;

}


public PoliceOfficer getPoliceOfficerObj () {

    return officerObj;

}


public void Calculation (int minute) { // the calculation method

    if(minute<61) {

        fine = FIRST_HOUR_FINE_RATE;

    }


    else if (minute>60 && minute<121){

        fine = FIRST_HOUR_FINE_RATE + ADDITIONAL_HOUR_FINE_RATE;

    }


    else if (minute>120 && minute<181){

        fine = FIRST_HOUR_FINE_RATE + 2*ADDITIONAL_HOUR_FINE_RATE;
```

```java
        }

        else if (minute>180) {
            fine = FIRST_HOUR_FINE_RATE + 3*ADDITIONAL_HOUR_FINE_RATE;
        }

        if(fine > MAXIMUM_FINE_RATE) {
            fine = MAXIMUM_FINE_RATE;
        }


        //return fine;

        // else if (minute>240) {
            // fine = FIRST_HOUR_FINE_RATE + 3*ADDITIONAL_HOUR_FINE_RATE;
        // }
    }

    @Override
    public String toString () { //toString method to display
        String str;
        str = "\n*********INFORMATION ON THE ILLEGALLY PARKED CAR(S)*********"+getParkedCarObj().toString()+"\n"
            +"\n*********THE DETAILS OF THE POLICE OFFICER*********"+getPoliceOfficerObj()+"\n"
            +"\nThe Rate of the Fine is \n"+getFine();

        return str;
    }

}
```

```java
//Student's Full Name- Tasfique Enam

//Student's ID- J16020825/5886429

//Modification Date 16/04/2019

//Purpose of this file- Parking Meter Class

package assignment1;


public class ParkingMeter { //declaring attributes

    private int PurchasedParkingTime;


    public ParkingMeter (){ //default constructor.

        PurchasedParkingTime = 0;

    }


    public void setPurchaseParkingTime (int PurchasedParkingTime) { //setter

        this.PurchasedParkingTime = PurchasedParkingTime;

    }


    public int getPurchaseParkingTime () { //getter

        return PurchasedParkingTime;

    }


    @Override
    public String toString(){ //toString to display

        String str;

        str = "\nPurchased Parking Time is \n"+getPurchaseParkingTime();

        return str;

    }



}
```

```java
//Student's Full Name- Tasfique Enam
//Student's ID- J16020825/5886429
//Modification Date 16/04/2019
//Purpose of this file- PoliceOfficer Class
package assignment1;

public class PoliceOfficer {
    private String officerName;
    private String badgeNumber;

    public PoliceOfficer () {
        officerName = null;
        badgeNumber = null;
    }

    public void setOfficerName(String officerName) { //setter
        this.officerName = officerName;
    }

    public void setBadgeNumber(String badgeNumber) {
        this.badgeNumber = badgeNumber;
    }

    public String getOfficerName() { //getter
        return officerName;
    }

    public String getBadgeNumber() {
        return badgeNumber;
    }
```

```java
    @Override

    public String toString(){ //toString to display

        String str;

        str = "\nThe Officer Name is \n"+getOfficerName()

            +"\nThe Badge Number of the Officer is \n"+getBadgeNumber()+"\n";

        return str;

    }

}


//Student's Full Name- Tasfique Enam

//Student's ID- J16020825/5886429

//Modification Date 16/04/2019

//Purpose of this file- Parked Car Class


package assignment1;


public class ParkedCar { //declaring attributes.

    private String CarMake;

    private String CarModel;

    private String CarColor;

    private String CarReg;

    private int MinuteParked;


    public ParkedCar (){ //constructor with the minuteparked initialised to 0 this is the default
constructor

        CarMake = "";

        CarModel = "";

        CarColor = "";

        CarReg = "";

        MinuteParked = 0;
```

```java
    }
    public ParkedCar (String CarMake, String CarModel, String CarColor, String CarReg, int
MinuteParked){ //non default constructor

        this.CarMake = CarMake;

        this.CarModel = CarModel;

        this.CarColor = CarColor;

        this.CarReg = CarReg;

        this.MinuteParked = MinuteParked;

    }


    public void setMinuteParked (int MinuteParked) { //setter method for minute parked.

        this.MinuteParked = MinuteParked;

    }


    public int getMinuteParked (){ //getter for minute parked.

        return MinuteParked;

    }



    @Override
     public String toString(){ //toString to Display

        String str;

        str = "\nThe Number of Minutes the Car was Parked \n"+getMinuteParked()+"\n"

            +"\n********************"+

            "\nTHE DETAILS OF THE CAR \n"+

            "********************\n"+

            "\nThe Car Maker is "+CarMake+

            "\nThe Model of the Car is "+CarModel+

            "\nThe Colour of the Car is "+CarColor+

            "\nThe Registration of the Car is "+CarReg+"\n";

        return str;
```

```
    }

}
```