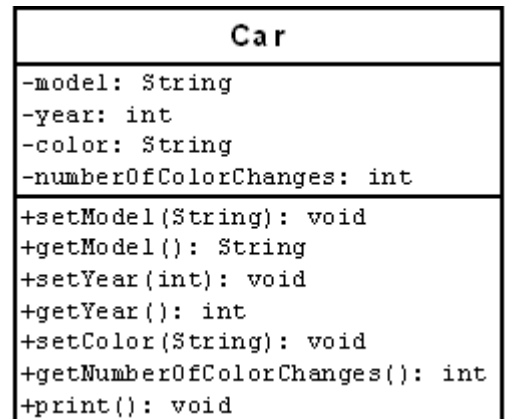


**Question 1:**

Define the class Car as shown in the UML Class diagram. Then Implement a main to test your class. The main should create three cars and change their colors 2,4,1 times respectively and print them.

The method `getNumberOfColorChanges()` returns how many times the method `setColor()` was called.



---

**Solution**

**Class (Car.java)**

```
public class Car {
    private String model;
    private int year;
    private String Color;
    private int numberOfColorChanges = 0;

    public void setColor(String C) {
        if(numberOfColorChanges < 3){
            Color = C;
            numberOfColorChanges++;
        }
    }

    public void setModel(String m) {
        model = m;
    }

    public void setYear(int y) {
        year = y;
    }

    public String getModel() {
        return model;
    }

    public int getNumberOfColorChanges() {
        return numberOfColorChanges;
    }

    public int getYear() {
        return year;
    }

    public void print(){
        System.out.println("the model of the car is: "+model);
        System.out.println("the year of the car is: "+year);
        System.out.println("the color of the car is: "+Color);
        System.out.println("the number of color changes of the car is: "
            +numberOfColorChanges);
    }
}
```

## Class (Main.java)

```
import java.util.Scanner;
public class Main {

    public static void main(String[] args) {
        Scanner S = new Scanner(System.in);
        Car C1,C2,C3;
        C1 = new Car();
        C2 = new Car();
        C3 = new Car();

        String model; //temp variable to store model before setting it to the Cars
        String Color; //temp variable to store color before setting it to the Cars
        int year;      //temp variable to store year before setting it to the Cars

        System.out.println("please Enter the model of the 1st Car:");
        model = S.next();
        C1.setModel(model);
        System.out.println("please Enter the year of the 1st Car:");
        year = S.nextInt();
        C1.setYear(year);
        System.out.println("please Enter the Color of the 1st Car:");
        Color = S.next();
        C1.setColor(Color);

        for(int i = 0; i < 1 ; i++){ // change the color 2 times
            System.out.println("please Change the Color of the 1st Car:");
            Color = S.next();
            C1.setColor(Color);
        }

        System.out.println("please Enter the model of the 2nd Car:");
        model = S.next();
        C2.setModel(model);
        System.out.println("please Enter the year of the 2nd Car:");
        year = S.nextInt();
        C2.setYear(year);
        System.out.println("please Enter the Color of the 2nd Car:");
        Color = S.next();
        C2.setColor(Color);
        for(int i = 0; i < 3 ; i++){ // change the color 4 times
            System.out.println("please Change the Color of the 2nd Car:");
            Color = S.next();
            C2.setColor(Color);
        }

        System.out.println("please Enter the model of the 3rd Car:");
        model = S.next();
        C3.setModel(model);
        System.out.println("please Enter the year of the 3rd Car:");
        year = S.nextInt();
        C3.setYear(year);
        System.out.println("please Enter the Color of the 3rd Car:");
        Color = S.next();
        C3.setColor(Color);

        System.out.println("=====\nthe information of the 1st Car:");
        C1.print();

        System.out.println("=====\nthe information of the 2nd Car:");
        C2.print();

        System.out.println("=====\nthe information of the 3rd Car:");
        C3.print();
    }
}
```

## Question 2:

Update the class Car in the previous question to limit the number of color changing to three times. Then run the same main.

The method setColor() should maintain this limit before setting the new color.

This time the run should displays 2,3,1 as the numbers of color changes

---

## Solution:

To maintain the limit change the method setColor() so it becomes:

```
public void setColor(String C) {  
    if(numberOfColorChanges < 3){  
        Color = C;  
        numberOfColorChanges++;  
    }  
}
```