

## Java Foundations Practices - Section 5

### Practice 5-1: Determining color in the visible spectrum

Write an interactive Java program, ColorRange.java, which when given a wavelength in nanometers will return the corresponding color in the visible spectrum.

You must implement the following using a suitable if decision statement.

1. Prompt the user to enter the wavelength, the wavelength should be of type double.
2. For each range (e.g. 380-450) the number on the left is included in the range, but the number on the right is not included in the range.
3. If the input value is not found on the visible spectrum then state that the wavelength is not within the visible spectrum.
4. Expected Output: a. Enter a color code 630 The color is Red b. Enter a color code 25.0  
Color Wavelength (nm) Violet 380-450 Blue 450-495 Green 495-570 Yellow 570-590 Orange 590-620 Red 620-750 The entered wavelength is not a part of the visible spectrum c. Enter a color code 750.5 The entered wavelength is not a part of the visible spectrum.

#### CODE:

```
import java.util.Scanner;

public class ColorRange {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter a color code: ");

        double wavelength = scanner.nextDouble();

        if (wavelength >= 380 && wavelength < 450) {

            System.out.println("The color is Violet");

        } else if (wavelength >= 450 && wavelength < 495) {

            System.out.println("The color is Blue");

        } else if (wavelength >= 495 && wavelength < 570) {

            System.out.println("The color is Green");

        } else if (wavelength >= 570 && wavelength < 590) {

            System.out.println("The color is Yellow");

        } else if (wavelength >= 590 && wavelength < 620) {

            System.out.println("The color is Orange");

        } else if (wavelength >= 620 && wavelength < 750) {
```

```

        System.out.println("The color is Red");
    } else {
        System.out.println("The entered wavelength is not a part of the visible spectrum");
    }
    scanner.close();
}
}

```

## OUTPUTS:

The screenshot shows a Java IDE with a file named 'Main.java'. The code is a Java program that takes a color code as input and prints the corresponding color name. The color code 630 is entered, and the output is 'The color is Red'. The code is as follows:

```

1- import java.util.Scanner;
2- public class ColorRange {
3-     public static void main(String[] args) {
4-         Scanner scanner = new Scanner(System.in);
5-         System.out.print("Enter a color code: ");
6-         double wavelength = scanner.nextDouble();
7-         if (wavelength >= 380 && wavelength < 450) {
8-             System.out.println("The color is Violet");
9-         } else if (wavelength >= 450 && wavelength < 495) {
10-            System.out.println("The color is Blue");
11-        } else if (wavelength >= 495 && wavelength < 570) {
12-            System.out.println("The color is Green");
13-        } else if (wavelength >= 570 && wavelength < 590) {
14-            System.out.println("The color is Yellow");
15-        } else if (wavelength >= 590 && wavelength < 620) {
16-            System.out.println("The color is Orange");
17-        } else if (wavelength >= 620 && wavelength < 750) {
18-            System.out.println("The color is Red");
19-        } else {
20-            System.out.println("The entered wavelength is not a part of the visible spectrum");
21-        }
22-        scanner.close();
23-    }
24- }

```

The output of the program is:

```

java -cp /tmp/rbRFZDIzQW/ColorRange
Enter a color code: 630
The color is Red

=== Code Execution Successful ===

```

The screenshot shows the same Java IDE with the same code. The color code 25.0 is entered, and the output is 'The entered wavelength is not a part of the visible spectrum'. The code is as follows:

```

1- import java.util.Scanner;
2- public class ColorRange {
3-     public static void main(String[] args) {
4-         Scanner scanner = new Scanner(System.in);
5-         System.out.print("Enter a color code: ");
6-         double wavelength = scanner.nextDouble();
7-         if (wavelength >= 380 && wavelength < 450) {
8-             System.out.println("The color is Violet");
9-         } else if (wavelength >= 450 && wavelength < 495) {
10-            System.out.println("The color is Blue");
11-        } else if (wavelength >= 495 && wavelength < 570) {
12-            System.out.println("The color is Green");
13-        } else if (wavelength >= 570 && wavelength < 590) {
14-            System.out.println("The color is Yellow");
15-        } else if (wavelength >= 590 && wavelength < 620) {
16-            System.out.println("The color is Orange");
17-        } else if (wavelength >= 620 && wavelength < 750) {
18-            System.out.println("The color is Red");
19-        } else {
20-            System.out.println("The entered wavelength is not a part of the visible spectrum");
21-        }
22-        scanner.close();
23-    }
24- }

```

The output of the program is:

```

java -cp /tmp/gAJiIirjpY/ColorRange
Enter a color code: 25.0
The entered wavelength is not a part of the visible spectrum

=== Code Execution Successful ===

```

```

Main.java
1 import java.util.Scanner;
2 public class ColorRange {
3     public static void main(String[] args) {
4         Scanner scanner = new Scanner(System.in);
5         System.out.print("Enter a color code: ");
6         double wavelength = scanner.nextDouble();
7         if (wavelength >= 380 && wavelength < 450) {
8             System.out.println("The color is Violet");
9         } else if (wavelength >= 450 && wavelength < 495) {
10            System.out.println("The color is Blue");
11        } else if (wavelength >= 495 && wavelength < 570) {
12            System.out.println("The color is Green");
13        } else if (wavelength >= 570 && wavelength < 590) {
14            System.out.println("The color is Yellow");
15        } else if (wavelength >= 590 && wavelength < 620) {
16            System.out.println("The color is Orange");
17        } else if (wavelength >= 620 && wavelength < 750) {
18            System.out.println("The color is Red");
19        } else {
20            System.out.println("The entered wavelength is not a part of the
                visible spectrum");
21        }
22        scanner.close();
23    }
24 }

Output
java -cp . /tmp/GNv0Eds1oP/ColorRange
Enter a color code: 750.5
The entered wavelength is not a part of the visible spectrum

=== Code Execution Successful ===

```

## Problem 5-2: Determining the next color for a stop light

The normal behavior for a stop light is to cycle from Red to Green to Yellow to Red (and continues with this pattern). Write a java program TrafficLightChecker.java, which will determine the next color of a stop light in this pattern, Red to Green to Yellow to Red based on the current stop light provided by the user.

### CODE:

```

import java.util.Scanner;

public class TrafficLightChecker {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter a color code: ");

        int currentColor = scanner.nextInt();

        if (currentColor == 1) {

            System.out.println("Next Traffic Light is green");

        } else if (currentColor == 2) {

            System.out.println("Next Traffic Light is yellow");

        } else if (currentColor == 3) {

            System.out.println("Next Traffic Light is red");

        } else {

            System.out.println("Invalid color");

        }

        scanner.close();

    }

}

```

## OUTPUTS:

Main.java	Output
<pre>1- import java.util.Scanner; 2 3- public class TrafficLightChecker { 4 5-     public static void main(String[] args) { 6         Scanner scanner = new Scanner(System.in); 7 8         System.out.print("Enter a color code: "); 9         int currentColor = scanner.nextInt(); 10 11         if (currentColor == 1) { 12             System.out.println("Next Traffic Light is green"); 13         } else if (currentColor == 2) { 14             System.out.println("Next Traffic Light is yellow"); 15         } else if (currentColor == 3) { 16             System.out.println("Next Traffic Light is red"); 17         } else { 18             System.out.println("Invalid color"); 19         } 20 21         scanner.close(); 22     } 23 } 24</pre>	<pre>java -cp /tmp/k0z0VX4bAz/TrafficLightChecker Enter a color code: 1 Next Traffic Light is green  === Code Execution Successful ===</pre>

Main.java	Output
<pre>1- import java.util.Scanner; 2 3- public class TrafficLightChecker { 4 5-     public static void main(String[] args) { 6         Scanner scanner = new Scanner(System.in); 7 8         System.out.print("Enter a color code: "); 9         int currentColor = scanner.nextInt(); 10 11         if (currentColor == 1) { 12             System.out.println("Next Traffic Light is green"); 13         } else if (currentColor == 2) { 14             System.out.println("Next Traffic Light is yellow"); 15         } else if (currentColor == 3) { 16             System.out.println("Next Traffic Light is red"); 17         } else { 18             System.out.println("Invalid color"); 19         } 20 21         scanner.close(); 22     } 23 } 24</pre>	<pre>java -cp /tmp/IkyPupM8f1/TrafficLightChe Enter a color code: 0 Invalid color  === Code Execution Successful ===</pre>

### Problem 5-3: Determining the next color for a stop light using switch

Implement practice 5-2 using switch statement and ensure the program alert users if they've entered any invalid value.

#### CODE:

```
import java.util.Scanner;

public class TrafficLightSwitch {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);
```

```

System.out.print("Enter a color code: ");

int currentColor = scanner.nextInt();

switch (currentColor) {

    case 1:

        System.out.println("Next Traffic Light is green");

        break;

    case 2:

        System.out.println("Next Traffic Light is yellow");

        break;

    case 3:

        System.out.println("Next Traffic Light is red");

        break;

    default:

        System.out.println("Invalid color");

        break;

}

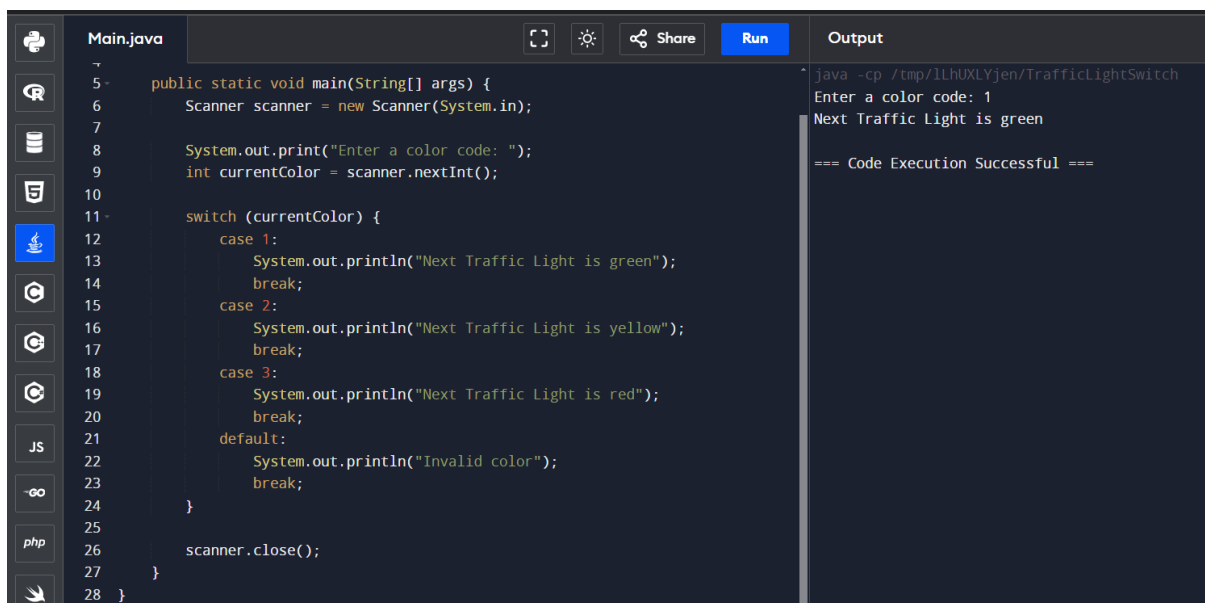
scanner.close();

}

}

```

## OUTPUTS:



The screenshot shows a Java IDE with a dark theme. On the left is a sidebar with icons for various languages and tools. The main editor displays the code for 'Main.java', which is a Java program that prompts the user to enter a color code (1 for green, 2 for yellow, 3 for red) and prints the next traffic light color. The code uses a switch statement and a Scanner object. On the right, the 'Output' panel shows the execution results: 'Enter a color code: 1' followed by 'Next Traffic Light is green'. Below the output, it says '=== Code Execution Successful ==='. The 'Run' button in the IDE is highlighted in blue.

```

Main.java
5- public static void main(String[] args) {
6-     Scanner scanner = new Scanner(System.in);
7-
8-     System.out.print("Enter a color code: ");
9-     int currentColor = scanner.nextInt();
10-
11-     switch (currentColor) {
12-         case 1:
13-             System.out.println("Next Traffic Light is green");
14-             break;
15-         case 2:
16-             System.out.println("Next Traffic Light is yellow");
17-             break;
18-         case 3:
19-             System.out.println("Next Traffic Light is red");
20-             break;
21-         default:
22-             System.out.println("Invalid color");
23-             break;
24-     }
25-
26-     scanner.close();
27- }
28- }

```















Output

```




java -cp /tmp/1LhUXLYjen/TrafficLightSwitch
Enter a color code: 1
Next Traffic Light is green

=== Code Execution Successful ===

```



Main.java



Run

```
5 public static void main(String[] args) {
6     Scanner scanner = new Scanner(System.in);
7
8     System.out.print("Enter a color code: ");
9     int currentColor = scanner.nextInt();
10
11     switch (currentColor) {
12         case 1:
13             System.out.println("Next Traffic Light is green");
14             break;
15         case 2:
16             System.out.println("Next Traffic Light is yellow");
17             break;
18         case 3:
19             System.out.println("Next Traffic Light is red");
20             break;
21         default:
22             System.out.println("Invalid color");
23             break;
24     }
25
26     scanner.close();
27 }
28 }
```

Output

java -cp /tmp/hZnuTlCW4U/TrafficLightSw  
Enter a color code: 6  
Invalid color  
  
=== Code Execution Successful ===