

```

import java.util.Scanner;

public class ColorRange {

    public static void main(String[] args) {
        // Create a Scanner object for user input
        Scanner scanner = new Scanner(System.in);

        // Define the valid range for each color component
        int minRange = 0;
        int maxRange = 255;

        // Prompt user to enter RGB values
        System.out.print(""Enter the Red component (0-255): "");
        int red = scanner.nextInt();

        System.out.print(""Enter the Green component (0-255): "");
        int green = scanner.nextInt();

        System.out.print(""Enter the Blue component (0-255): "");
        int blue = scanner.nextInt();

        // Check if the RGB values are within the specified range
        boolean isValidRed = red >= minRange && red <= maxRange;
        boolean isValidGreen = green >= minRange && green <= maxRange;
        boolean isValidBlue = blue >= minRange && blue <= maxRange;

        // Display results
        System.out.println(""\nColor Component Validity:"");
        System.out.println(""Red: " + (isValidRed ? "Valid" : "Invalid"));
        System.out.println(""Green: " + (isValidGreen ? "Valid" : "Invalid"));
        System.out.println(""Blue: " + (isValidBlue ? "Valid" : "Invalid"));

        // Close the scanner
        scanner.close();
    }
}

```

2. To build a TrafficLightChecker class, you should focus on creating a system that simulates the behavior of traffic lights. This simulation can

be expanded to include functionalities such as checking the current light

status, determining the duration of each light phase, and providing a mechanism for switching between lights.

```
import java.util.Scanner;

public class TrafficLightChecker {

    // Enum to define traffic light states
    private enum TrafficLight {

        RED, YELLOW, GREEN

    }

    // Method to get the next traffic light based on current light
    private static TrafficLight getNextLight(TrafficLight current) {

        switch (current) {

            case RED:

                return TrafficLight.GREEN;

            case YELLOW:

                return TrafficLight.RED;

            case GREEN:

                return TrafficLight.YELLOW;

            default:

                throw new IllegalArgumentException(""Unexpected value: &quot; +
                    current);

        }

    }

    // Method to display the traffic light status
    private static void displayStatus(TrafficLight light) {

        switch (light) {

            case RED:

                System.out.println(""The light is RED. Please stop.&quot;);

                break;

            case YELLOW:
```

```
System.out.println(&quot;The light is YELLOW. Prepare to stop.&quot;);  
break;
```

```
case GREEN:
```

```
System.out.println(&quot;The light is GREEN. You may go.&quot;);  
break;
```

```
}
```

```
}
```

```
public static void main(String[] args) {
```

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

```
// Prompt user for the initial traffic light state
```

```
System.out.print(&quot;Enter the current traffic light color (RED,  
YELLOW, GREEN): &quot;);
```

```
String input = scanner.next().toUpperCase();
```

```
TrafficLight currentLight;
```

```
try {
```

```
// Convert the input string to TrafficLight enum
```

```
currentLight = TrafficLight.valueOf(input);
```

```
} catch (IllegalArgumentException e) {
```

```
System.out.println(&quot;Invalid color entered. Please enter RED,  
YELLOW, or GREEN.&quot;);
```

```
scanner.close();
```

```
return;
```

```
}
```

```
// Display the current light status
```

```
displayStatus(currentLight);
```

```
// Determine the next traffic light state
```

```
TrafficLight nextLight = getNextLight(currentLight);
```

```
// Display the next light status
```

```
System.out.println(&quot;The next light will be: &quot; + nextLight);
```

```
displayStatus(nextLight);
```

```
// Close the scanner
```

```
scanner.close();
```

```
}
```

```
}
```

3. To implement a `TrafficLightSwitch` class that simulates switching traffic lights, you might want to create functionality for managing the current state of the traffic light, switching between states, and possibly displaying information about the light. Below is a detailed example of how you could set up this class:

```
import java.util.Scanner;
```

```
public class TrafficLightSwitch {
```

```
// Enum to define traffic light states
```

```
private enum TrafficLight {
```

```
RED, YELLOW, GREEN
```

```
}
```

```
// Method to get the next traffic light based on current light
```

```
private static TrafficLight getNextLight(TrafficLight current) {
```

```
switch (current) {
```

```
case RED:
```

```
return TrafficLight.GREEN;
```

```
case YELLOW:
```

```
return TrafficLight.RED;
```

```
case GREEN:
```

```
return TrafficLight.YELLOW;
```

```
default:
```

```
throw new IllegalArgumentException("Unexpected value: " + current);
```

```
}
```

```
}
```

```
// Method to display the traffic light status
```

```
private static void displayStatus(TrafficLight light) {
```

```
switch (light) {
```

```

case RED:

System.out.println(&quot;The light is RED. Please stop.&quot;);

break;


case YELLOW:

System.out.println(&quot;The light is YELLOW. Prepare to stop.&quot;);

break;

case GREEN:

System.out.println(&quot;The light is GREEN. You may go.&quot;);

break;

}

}

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

// Prompt user for the initial traffic light state

System.out.print(&quot;Enter the current traffic light color (RED, YELLOW,
GREEN): &quot;);

String input = scanner.next().toUpperCase();

TrafficLight currentLight;

try {

// Convert the input string to TrafficLight enum

currentLight = TrafficLight.valueOf(input);

} catch (IllegalArgumentException e) {

System.out.println(&quot;Invalid color entered. Please enter RED, YELLOW, or
GREEN.&quot;);

scanner.close();

return;

}

// Display the current light status

displayStatus(currentLight);

// Determine the next traffic light state

```

```
TrafficLight nextLight = getNextLight(currentLight);  
  
// Display the next light status  
  
System.out.println("&quot;The next light will be: &quot; + nextLight);  
  
displayStatus(nextLight);  
  
// Close the scanner
```

```
scanner.close();  
  
}  
  
}  
  
public class TrafficLight {  
  
    public static void main(String[] args) {  
  
        String[] lights = {"RED", "GREEN", "YELLOW"};  
  
        String currentLight = lights[0];  
  
  
        for (int i = 0; i < 3; i++) {  
  
            System.out.println("The light is " + currentLight);  
  
            if (currentLight.equals("RED")) {  
  
                currentLight = "GREEN";  
  
            } else if (currentLight.equals("GREEN")) {  
  
                currentLight = "YELLOW";  
  
            } else {  
  
                currentLight = "RED";  
  
            }  
  
            try {  
  
                Thread.sleep(2000); // wait for 2 seconds  
  
            } catch (InterruptedException e) {  
  
                Thread.currentThread().interrupt();  
  
            }  
  
        }  
  
    }  
  
}
```

```
java -cp /tmp/MIQ9MsQVZ1/T
```

The light is RED

The light is GREEN

The light is YELLOW