

Exercises for Programming Practice 1

The submitted program will be evaluated as described in “Lesson Plan (2021)”.

Note:

- ✓ Do not create “module-info.java”, when you create a Java Project.
- ✓ Do not set Package name in the window “New Java Class”.
- ✓ The following information must be included as a comment at the first part of the program.
 - Contents of the program
 - ❖ Do not use the title of exercise for “contents of the program”
Think about “contents of the program” yourself.
 - Submission date
 - Program creator
- ✓ Wrong file name (including case sensitivity) is not accepted.

The deadline for submitting the programs is 18:00 on November 25th, 2021.

Exercise 17 (file name “Exercise17.java”)

Create Java program “Exercise17.java” which uses “MouseListener” and satisfies the following conditions.

- (1) The window size is 500 pixels wide by 500 pixels vertical.
- (2) When the mouse cursor enters the window, the string “Enter” is posted on the upper right (Figure 1 (a)). When the mouse cursor moves outside the window, the string disappears.
- (3) A green circle with a size of 100 pixels is filled at the cursor position, when the mouse is pressed in the window (Figure 1 (b)). The position of the mouse cursor when the button is pressed is the center of the circle. This green circle does not disappear when the mouse is released.
- (4) There is no change in the display even if the click is recognized.

You can refer to “Interface1.java” on page 3 of “Interface” (the ninth day), “Week 9” page in Resource of “Programming Language” course, manaba+R.

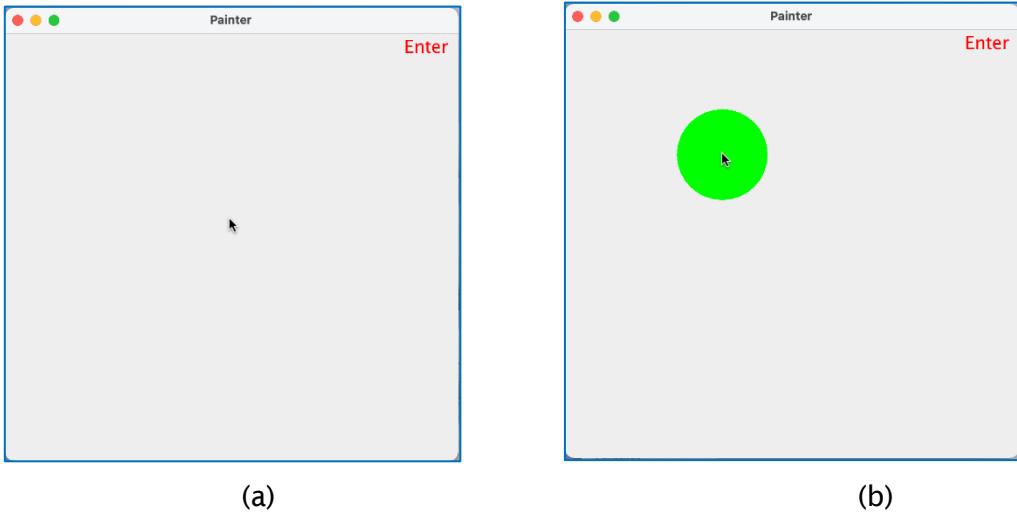


Figure 1. (a) The state of (2), (b) The state of (3).

Exercise 18 (file name “Exercise18.java”)

Create Java program “Exercise18.java” in which the color is changed using ActionListener and the following conditions are satisfied in addition to the Exercise 17 conditions.

- (1) In order to use ActionListener and MouseListener interfaces, the class declaration part is expressed as follows.

```
public class Exercise18 extends JFrame implements MouseListener, ActionListener {
```

- (2) The label of the button on the upper side of window (NORTH region) shows the color of the circle filled. The initial value of the button label is green. Every time the button is pressed, the label cyclically changes in order of green, yellow, blue and red.

The circle should always be painted in the same color as the button indicates. For this, the "repaint()" function should be used when changing the label of the button.

The examples are shown in Figure 2.

- (3) The following arrays for Color “colorSet” and String “colorLabel” are used to set the circle color, and to set the label to the button.

```
Color[] colorSet = {Color.green, Color.yellow, Color.blue, Color.red};  
String[] colorLabel = {"green", "yellow", "blue", "red"};
```

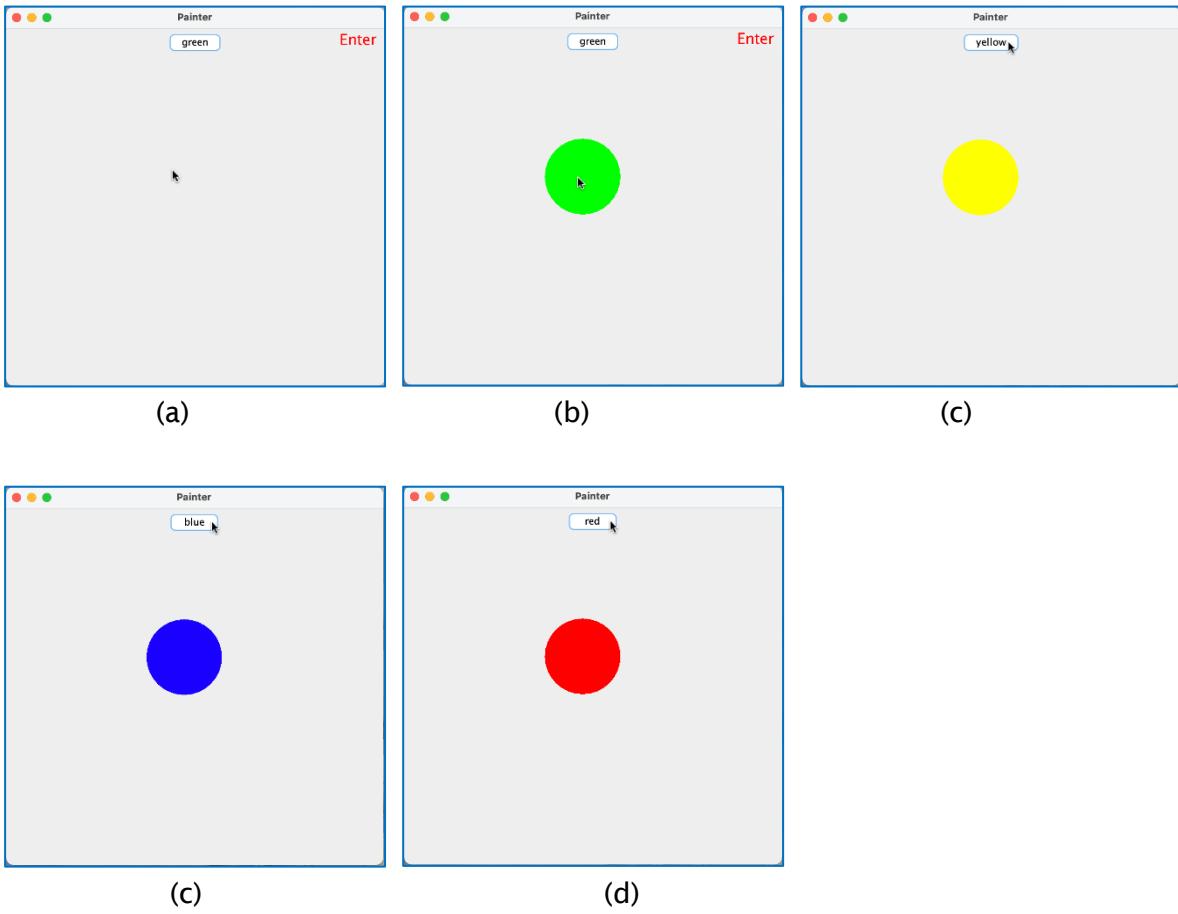


Figure 2. (a) The initial state, (b) The first pressed state,
 (c) The button has changed to yellow,
 (d) The button has changed to blue,
 (d) The button has changed to red.

Exercise 19 (file name “Exercise19.java”)

Create Java program “Exercise19.java” in which the shape to be drawn is changed using ActionListener and the following conditions are satisfied in addition to the Exercise 18 conditions.

- (1) A square is drawn in addition to a circle. The center of the square is the position of the mouse cursor when the mouse button is pressed.
- (2) A button (right_button) that displays the shape is added to the right of the button (left_button) that displays the color. The label of the right_button is initially “Circle”, and “Square” and “Circle” are alternately displayed each time the right_button is pressed.

Shapes and colors should always be drawn in the same shape and color as the buttons indicate. For this reason, the "repaint()" function must be used when changing the label of a button.

The examples are shown in Figure 3.

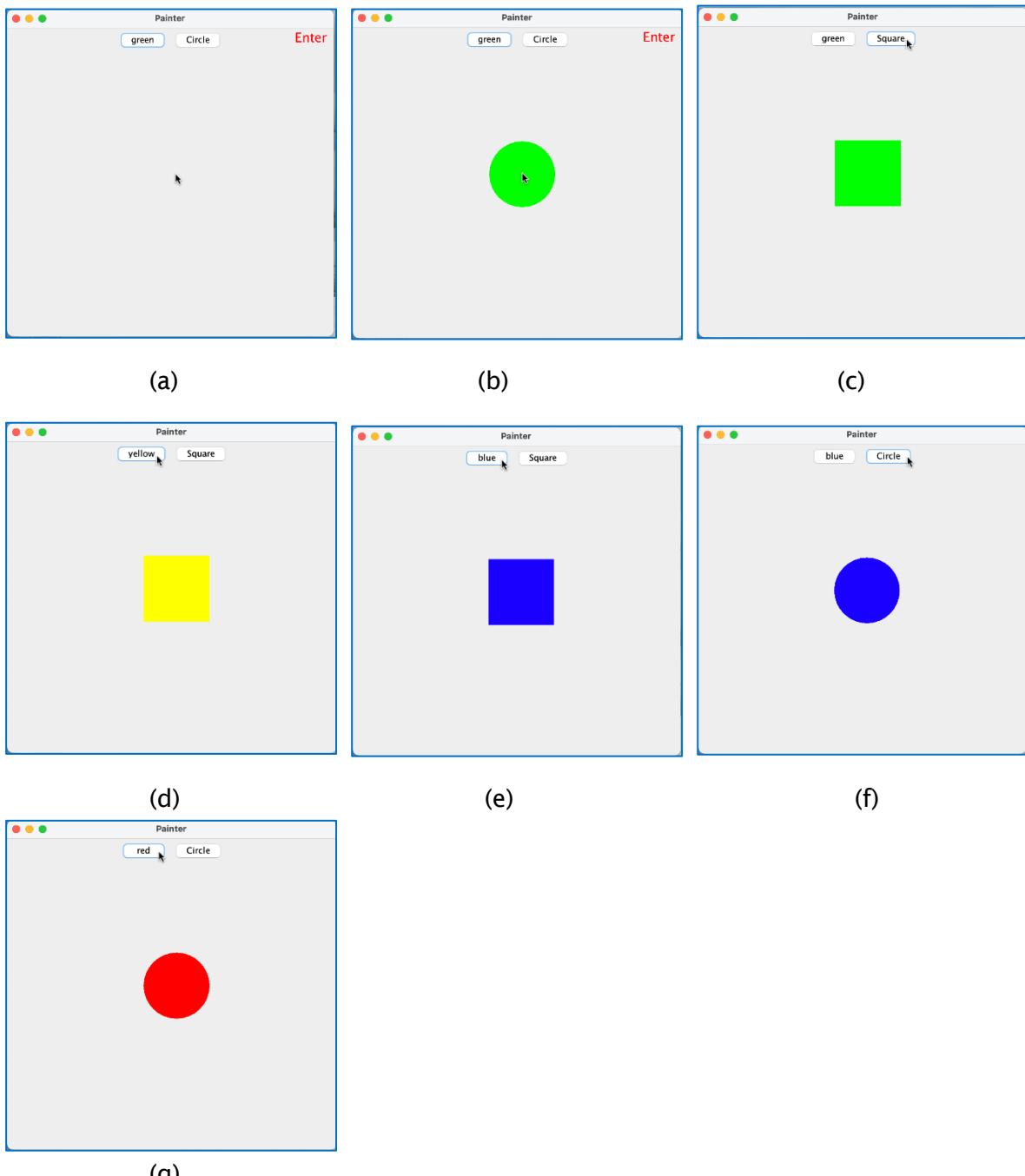


Figure 3. (a) The situation where the mouse is entered to the window,
(b) The result of pressing in the window in the state of (a),
(c) The result of pressing the right_button in the state of (b),
(d) The result of pressing the left_button in the state of (c).
(e) The result of pressing the left_button in the state of (d).
(f) The result of pressing the right_button in the state of (e).
(g) The result of pressing the left_button in the state of (f).