Assignment 8 - Turn In Form

- Copy and paste your code for the different problems in the boxes indicated.
- Add images where asked for.
- When you are finished, download this file as a PDF and submit it to Canvas.

Rectangles.java

```
// To use a class defined in another package, you have to import it.
// Point and Rectangle are in the java.awt package, so you import
// them like this:
import java.awt.Point;
import java.awt.Rectangle;

/**
 * Rectangles.java
 * Joey Koumjian
 * 7/3/22
 */
public class Rectangles
{
    public static void main(String [] args)
    {
        System.out.println("\f");
        Rectangle box = new Rectangle(30,20,100,50);
        System.out.println("box = " + box);

        // 1) Use box.translate to move box to the location x=80, y=50
        box.translate(50,30);
        System.out.println("1) after translating, box = " + box);

        // 2) Use box.translate to move box to the location in Point p
        //    by figuring out the change in x based on p.x and box.x
        //    and the change in y and using translate with these values
        Point p = new Point(250,210);
        int dx = p.x - box.x;
        int dy = p.y - box.y;
        box.translate(dx,dy);
        System.out.println("2) after translating, box = " + box);
        System.out.println("2) should be [x=250,y=210,width=100,height=50");


        // 3) Write a method that returns the lower right point of a
rectangle
        //    then uncomment the two lines below and test it.

        Rectangle box2 = new Rectangle(100,200,20,30);
        Point pLR = lowerRight(box2);   // define lowerRight below main
        System.out.println("3) lower right corner of box2 = " + pLR);
```

```
        System.out.println("3) should be [x=120,y=230]");

        // 4) Write a method that returns a new Rectangle that is next to
the
        //    one passed to it. Then uncomment the next two lines and test
it.

        Rectangle box3 = adjacentRectangle(box2);  // define
adjacentRectangle below main
        System.out.println("4) rectangle adjacent to box2 = " + box3);
        System.out.println("4) should be [x=120,y=200,width=20,height=30]");
        System.out.println("4) box2 (should still be [100,200,20,30]) = " +
box2);

    }

    public static void printPoint(Point p) {
        System.out.println("(" + p.x + ", " + p.y + ")");
    }

    public static double distance(Point p1, Point p2) {
        double dx = p2.x - p1.x;
        double dy = p2.y - p1.y;
        return Math.sqrt(dx*dx + dy*dy);
    }

    public static Point findCenter(Rectangle rect) {
        int x = rect.x + rect.width/2;
        int y = rect.y + rect.height/2;
        return new Point(x, y);
    }

    public static Point lowerRight(Rectangle r) {
        int x = r.x + r.width;
        int y = r.y + r.height;
        return new Point(x,y);
    }

    public static Rectangle adjacentRectangle(Rectangle r) {
        int x = r.x + 20;
        return new Rectangle(x, r.y, r.width, r.height);
    }
}
```

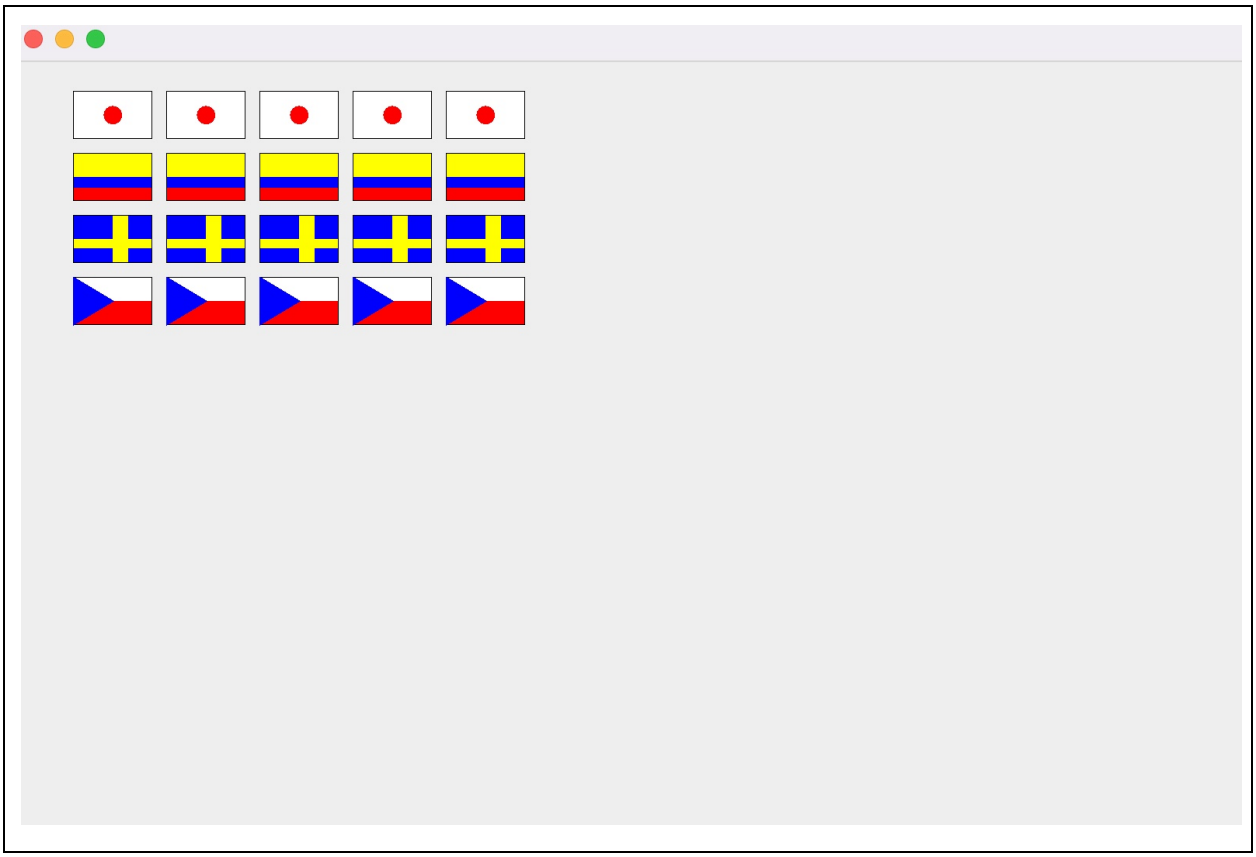
DrawFlag.java

```
/**
 * DrawFlag.java
 * Joey Koumjian
 * 7/3/22
 */
import java.awt.Color;
import java.awt.Canvas;
import java.awt.Graphics;
import java.awt.Point;
import java.awt.Rectangle;
import java.awt.Polygon;
import javax.swing.JFrame;
import java.util.Scanner;

public class DrawFlag extends Canvas {   // DrawFlag is a kind of Canvas
                                         // that we can draw our own
pictures on
    public static void main(String[] args) {
        // Create a JFrame object, which is a window that can contain the
canvas,
        // buttons, menus, and other window components;
        JFrame frame = new JFrame();
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

        // add the canvas
        // Canvas class is used to create an area in a frame to be
        //   used for displaying graphics.
        Canvas canvas = new DrawFlag(); // Create a DrawFlag object called
canvas
        canvas.setSize(800, 500);          // Set the size of our canvas
        frame.getContentPane().add(canvas);// Add our canvas to the JFrame
object

        // Display the frame on the screen.
        frame.pack();
        frame.setVisible(true);
    }

    public void paint(Graphics g) {
        //Rectangle frame = new Rectangle(10,50,200,130);
        Rectangle frame = new Rectangle(40,20,50,30);
        int count = 0;
        while (count < 5) {
            japaneseFlag(g,frame);
            frame.translate(0,40);
            columbianFlag(g,frame);
            frame.translate(0,40);
            sweedishFlag(g,frame);
            frame.translate(0,40);
            czechFlag(g,frame);
```

```
            // translate frame over 60 to the right
            frame.translate(60, -120);
            // add 1 to count
            count++;
        }
        count = 0;

    }

    public static void japaneseFlag(Graphics g, Rectangle frame){
        g.setColor(Color.black);
        g.drawRect(frame.x, frame.y, frame.width, frame.height);
        g.setColor(Color.white);
        g.fillRect(frame.x, frame.y, frame.width, frame.height);

        Point center = findCenter(frame);
        g.setColor(Color.red);
        Rectangle sun = new Rectangle(center.x, center.y, frame.width/4,
frame.width/4);
        sun.translate(-sun.width/2,-sun.width/2);
        g.fillOval(sun.x,sun.y,sun.width,sun.height);
    }

    public static void columbianFlag(Graphics g, Rectangle frame) {
        g.setColor(Color.black);
        g.drawRect(frame.x, frame.y, frame.width, frame.height);
        g.setColor(Color.yellow);
        g.fillRect(frame.x, frame.y, frame.width, frame.height);

        Point center = findCenter(frame);

        g.setColor(Color.red);
        g.fillRect(frame.x,center.y,frame.width, frame.height/2);

        g.setColor(Color.blue);
        g.fillRect(frame.x, center.y, frame.width, frame.height /4);
    }

    public static void sweedishFlag(Graphics g, Rectangle frame) {
        g.setColor(Color.black);
        g.drawRect(frame.x, frame.y, frame.width, frame.height);
        g.setColor(Color.blue);
        g.fillRect(frame.x, frame.y, frame.width, frame.height);

        Point center = findCenter(frame);

        g.setColor(Color.yellow);
        g.fillRect(center.x, frame.y, frame.width/5, frame.height);
        g.fillRect(frame.x, center.y, frame.width, frame.height/5);
    }

    public static void czechFlag(Graphics g, Rectangle frame) {
        g.setColor(Color.black);
```

```
        g.drawRect(frame.x, frame.y, frame.width, frame.height);
        g.setColor(Color.white);
        g.fillRect(frame.x, frame.y, frame.width, frame.height);

        Point center = findCenter(frame);

        g.setColor(Color.red);
        g.fillRect(frame.x, center.y, frame.width, frame.height/2);

        g.setColor(Color.blue);
        Polygon triangle = new Polygon();
        triangle.addPoint(frame.x,frame.y);
        triangle.addPoint(center.x,center.y);
        triangle.addPoint(frame.x,frame.y+frame.height);
        g.drawPolygon(triangle);
        g.fillPolygon(triangle);


    }

    public static Point findCenter(Rectangle rect) {
        int x = rect.x + rect.width/2;
        int y = rect.y + rect.height/2;
        return new Point(x, y);
    }

}
```

allFlags.jpg -- screen capture of your final graphic output showing all the flags you created



House.java - Version 1 - single House

```
/*
 * Example code for Think Java (http://thinkapjava.com)
 *
 * Adapted from http://en.wikibooks.org/wiki/Java_Programming/Canvas
 *
 * Copyright(c) 2011 Allen B. Downey
 * GNU General Public License v3.0 (http://www.gnu.org/copyleft/gpl.html)
 *
 * @author Allen B. Downey
 */

import java.awt.Color;
import java.awt.Canvas;
import java.awt.Graphics;
import java.awt.Point;
import java.awt.Rectangle;
import java.awt.Polygon;
import javax.swing.JFrame;
import java.util.Scanner;

public class House extends Canvas {
```

```
    public static void main(String[] args) {
        // Create a JFrame object, which is a window that can contain the
canvas,
        // buttons, menus, and other window components;
        JFrame frame = new JFrame();
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

        // add the canvas
        // Canvas class is used to create an area in a frame to be
        //   used for displaying graphics.
        Canvas canvas = new House(); // Create a Canvas object called canvas
        canvas.setSize(700, 500);          // Set the size of our canvas
        frame.getContentPane().add(canvas);// Add our canvas to the JFrame
object

        // Display the frame on the screen.
        frame.pack();
        frame.setVisible(true);
    }

    public void paint(Graphics g) {
    // draw a blue circle
        Rectangle box = new Rectangle(100,100, 500,300);
        g.setColor(Color.yellow);
        g.fillRect(box.x, box.y, box.width, box.height);

        g.setColor(Color.green);
        g.fillRect(200,200,50,50);
        g.fillRect(450,200,50,50);

        g.setColor(Color.blue);
        g.fillRect(325,300,50,100);

        g.setColor(Color.red);
        Polygon triangle = new Polygon();
        triangle.addPoint(100,100);
        triangle.addPoint(600,100);
        triangle.addPoint(325,10);
        g.drawPolygon(triangle);
        g.fillPolygon(triangle);

        // Replace the above statements with code that draws an image of a
house.

    }

}
```

house.jpg -- screen capture of your graphic output image for Version 1