```java
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/* Code for COMP102 - 2024T3, Assignment 1
 * Name:
 * Username:
 * ID:
 */

import ecs100.*;
import java.awt.Color;
import java.awt.Graphics;
import javax.swing.*;
import java.awt.*;

/**
 * Draws various flags
 *
 * You can find lots of flag details (including the correct dimensions and colours)
 * from  http://www.crwflags.com/fotw/flags/
 */

public class FlagDrawer{

    public static final double LEFT = 100;  // the left side of the flags
    public static final double TOP = 50;     // the top of the flags

    // CORE
    /**
     * Draw the flag of Belgium.
     * The flag has three vertical stripes;
     * The left is black, the middle is yellow, and the right is red.
     * The flag is 13/15 as high as it is wide (ratio 13:15).
     */
    public void drawBelgiumFlag(){
        UI.clearGraphics();
        UI.println("Belgium Flag");
        double width = UI.askDouble("How wide: ");
        /*# YOUR CODE HERE */
        double high = width*13/15;
        UI.drawRect(0,0,width,high);
        UI.setColor(Color.black);
        UI.fillRect(0,0,width/3,high);
        UI.setColor(Color.yellow);
        UI.fillRect(width/3,0,width/3,high);
        UI.setColor(Color.red);
        UI.fillRect( width*2/3 ,0,width/3,high);


    }

    //CORE
    /**
     *  The Red Cross flag consists of a white square with a red cross in the center
     *  The cross can be drawn as a horizontal rectangle and a vertical rectangle.
     */
    public void drawRedCrossFlag() {
        UI.println("Red Cross Flag: ");
        UI.clearGraphics();
        double size = UI.askDouble("How wide: ");
        /*# YOUR CODE HERE */
         UI.drawRect(0,0,size,size);
        UI.setColor(Color.red);
        UI.fillRect(size*0.4,size*0.2,size*0.2,size*0.6);
        UI.fillRect(size*0.2,size*0.4,size*0.6,size*0.2);


    }
```

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    // COMPLETION
    /**
     *  Pacman
     *  A red pacman facing up on a black background chasing yellow, green, and blue dots.
     */
    public  void drawPacman() {
        UI.clearGraphics();
        UI.println("Pacman Flag");
        double width = UI.askDouble("How wide: ");
        /*# YOUR CODE HERE */
        double high = 1.5 * width;
        UI.setColor(Color.black);
        UI.fillRect(0,0,width,high);

        UI.setColor(Color.red);
        UI.fillArc(width * 1/4,150,100,100,-250,320);
        UI.setColor(Color.yellow);
        UI.fillOval(width*4/9,130,20,20);
        UI.setColor(Color.green);
        UI.fillOval(width*4/9,80,20,20);
        UI.setColor(Color.blue);
        UI.fillOval(width*4/9,30,20,20);

    }

    // COMPLETION
    /**
     * Draw the flag of Greenland.
     * The top half of the flag is white, and the bottom half is red.
     * There is a circle in the middle (off-set to left)  which is
     * also half white/red but on the opposite sides.
     * The flag is 2/3 as high as it is wide (ratio 2:3).
     */
    public void drawGreenlandFlag() {
        UI.clearGraphics();
        UI.println("Greenland Flag");
        double width = UI.askDouble("How wide: ");
        /*# YOUR CODE HERE */
        double high = width*2/3;
        UI.setColor(Color.black);
        UI.drawRect(0,0,width,high);
        UI.setColor(Color.white);
        UI.fillRect(0,0,width,high/2);
        UI.setColor(Color.red);
        UI.fillRect(0,high/2,width,high/2);
        UI.setColor(Color.red);
        UI.fillArc(width * 1/6,high*1/5,90,90,0,180);
        UI.setColor(Color.white);
        UI.fillArc(width * 1/6,high*1/6.5,90,90,0,-180);

    }

    // CHALLENGE
    /**
     *  The Jamaican flag has a yellow diagonal cross with
     *  green triangles top and bottom, and black triangles left and right.
     */
    public void drawJamaicaFlag(){
        UI.clearGraphics();
        UI.println("Flag of Jamaica");
        double width = UI.askDouble("How wide: ");
        double high = width * 1 / 2;

        // Coordinates for the first yellow triangle
        double yellowX1[] = {width / 2, width / 12, width * 11 / 12};
        double yellowY1[] = {high * 5 / 12, 0, 0};

        // Coordinates for the second yellow triangle
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        double yellowX2[] = {width / 2, width / 12, width * 11 / 12};
        double yellowY2[] = {high * 7 / 12, high, high};

        // Coordinates for the first black triangle
        double blackX1[] = {0, width * 5 / 12, 0};
        double blackY1[] = {high / 12, high / 2, high * 11 / 12};

        // Coordinates for the second black triangle
        double blackX2[] = {width, width * 7 / 12, width};
        double blackY2[] = {high / 12, high / 2, high * 11 / 12} ;

        // Drawing the flag
        UI.drawRect(0, 0, width, high);
        UI.setColor(Color.yellow);
        UI.fillRect(0, 0, width, high);
        UI.setColor(Color.green);
        UI.fillPolygon(yellowX1, yellowY1, 3);
        UI.fillPolygon(yellowX2, yellowY2, 3);
        UI.setColor(Color.black);
        UI.fillPolygon(blackX1, blackY1, 3);
        UI.fillPolygon(blackX2, blackY2, 3);


    }




    /**    CHALLENGE
     * The 3 stars flag has a blue vertical stripe on the left and black
     * vertical stripe on the right and 3 red 5 pointed stars in the middle stripe
     * The height is 2/3 of the width,
     * A full marks solution will have a method for drawing a 5 pointed star,
     * and call that method for each of the stars
     */
    public void drawThreeStarsFlag() {
        UI.clearGraphics();
        UI.println("Three stars Flag");
        double width = UI.askDouble("How wide: ");
        /*# YOUR CODE HERE */
        double high = width * 2/3;



        UI.setColor(Color.black);
        UI.drawRect(0,0,width,high);
        UI.setColor(Color.blue);
        UI.fillRect(0,0,width*1/3,high);
        UI.setColor(Color.white);
        UI.fillRect(width*1/3,0,width*1/3,high);
        UI.setColor(Color.black);
        UI.fillRect(width*2/3,0,width*1/3,high);
        UI.setColor(Color.red);



    }


    /**
     * Set up the GUI to have buttons to call each method
     */
    public void setupGUI(){
        UI.addButton("Clear", UI::clearPanes);
        UI.addButton("Core: Flag of Belgium", this::drawBelgiumFlag);
        UI.addButton("Core: Red Cross Flag",  this::drawRedCrossFlag);
```

```
        // COMPLETION
        UI.addButton("Completion: Pacman Flag", this::drawPacman);
        UI.addButton("Completion: Flag of Greenland", this::drawGreenlandFlag);
        // CHALLENGE
        UI.addButton("Challenge: Flag of Jamaica", this::drawJamaicaFlag);
        UI.addButton("Challenge: Three stars flag", this::drawThreeStarsFlag);
        UI.addButton("Quit", UI::quit);

        UI.setDivider(0.3);
    }

    public static void main(String[] arguments){
        FlagDrawer fd = new FlagDrawer();
        fd.setupGUI();
    }

}
```