Complex Methods

A. Input

This code draws a heart asks for a co-ordinate and draws a heart on the screen.

Make it so that it draws four hearts, all near the co-ordinate.




```
import java.applet.Applet;
import java.awt.*;
import javax.swing.*;

public class Code10A_simpleInput extends Applet
{
    public void paint (Graphics g)
    {
        int x = Integer.parseInt (JOptionPane.showInputDialog ("Enter an x value: "));
        int y = Integer.parseInt (JOptionPane.showInputDialog ("Enter an x value: "));
        heart (x, y);
        //draw four more hearts

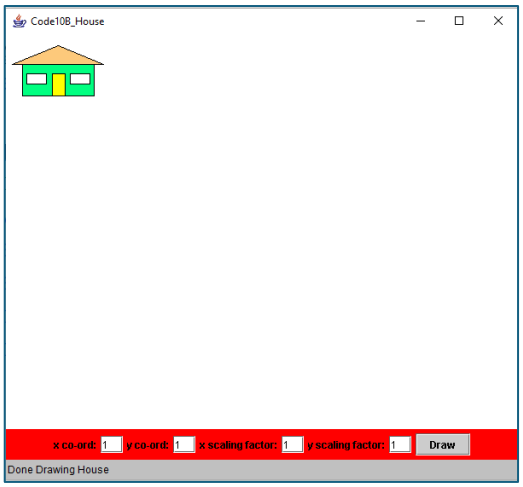
     }

    public void heart (int x, int y)
    {
        Graphics g = getGraphics ();
        Color c = new Color ((int) (Math.random () * 100) + 155, 0, (int) (Math.random () * 100) + 155);
        g.setColor (c);
        g.fillOval (x, y, 10, 10);
        g.fillOval (x + 8, y, 10, 10);
        int xArray[] = {x, x + 8, x + 18};
        int yArray[] = {y + 6, y + 15, y + 6};
        g.fillPolygon (xArray, yArray, 3);
    }
}
```

B. House

Adapt the house program so that all the colours are changed.

Four colours need changing.




```
import java.applet.*;
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
/**
* Draws a house on the screen, allows the user to move and scale it
*/
public class Code10B_House extends Applet implements ActionListener
{
    //Widgets, Panels
    JButton draw;
    JLabel lx, ly, lxscale, lyscale;
    JTextField tx, ty, txscale, tyscale;
    Panel flow;
    //House Coordinates, initialized to 1. (Top Right and No Scaling)
    int x = 1;
    int y = 1;
    int xz = 1;
    int yz = 1;
    public void init ()
    { //Set Up Input Fields for House Coordinates
        lx = new JLabel ("x co-ord:");
        ly = new JLabel ("y co-ord:");
        lxscale = new JLabel ("x scaling factor:");
        lyscale = new JLabel ("y scaling factor:");
        tx = new JTextField ("1", 2);
        ty = new JTextField ("1", 2);
        txscale = new JTextField ("1", 2);
        tyscale = new JTextField ("1", 2);
        //Set up draw button and actionlistener
        draw = new JButton ("Draw");
        draw.addActionListener (this);
        draw.setActionCommand ("draw");
        //Set up layout, add widgets
        setLayout (new BorderLayout ());
        flow = new Panel (new FlowLayout ());
        flow.add (lx);
        flow.add (tx);
        flow.add (ly);
        flow.add (ty);
        flow.add (lxscale);
        flow.add (txscale);
        flow.add (lyscale);
        flow.add (tyscale);
        flow.add (draw);
        flow.setBackground (Color.red);
        add (flow, "South");
        resize (600, 500);
    }
```

```
public void paint (Graphics g)
{ //draw a white box over the background to erase everything
    g.setColor (Color.white);
    g.fillRect (0, 0, 600, 500);
    //draw the house passing in the global variables
    littlehouse (x, y, xz, yz);
    //used only to force an update
    showStatus ("Done Drawing House");
}


/** Draws a little house
* @param x is the top x co-ordinate of the house
* @param y is the left most y co-ordinate of the house
* @param xz is the x scaling factor, stretches horizontally
* @param yz is the y scaling factor, stretches vertically
*/
public void littlehouse (int x, int y, int xz, int yz)
{
    Color lightgreen = new Color (0, 255, 128);
    Color lightorange = new Color (253, 201, 123);
    Graphics g = getGraphics ();
    x = x / xz; //reset top based on scaling factor
    y = y / yz; //reset right coordinate based on scaling factor
    //green box
    g.setColor (lightgreen);
    g.fillRect ((x + 18) * xz, (y + 34) * yz, 84 * xz, 37 * yz);
    g.setColor (Color.black);
    g.drawRect ((x + 18) * xz, (y + 34) * yz, 84 * xz, 37 * yz);
    //windows
    g.setColor (Color.white);
    g.fillRect ((x + 23) * xz, (y + 45) * yz, 23 * xz, 12 * yz);
    g.fillRect ((x + 74) * xz, (y + 45) * yz, 23 * xz, 12 * yz);
    g.setColor (Color.black);
    g.drawRect ((x + 23) * xz, (y + 45) * yz, 23 * xz, 12 * yz);
    g.drawRect ((x + 74) * xz, (y + 45) * yz, 23 * xz, 12 * yz);
    //door
    g.setColor (Color.yellow);
    g.fillRect ((x + 53) * xz, (y + 45) * yz, 15 * xz, 26 * yz);
    g.setColor (Color.black);
    g.drawRect ((x + 53) * xz, (y + 45) * yz, 15 * xz, 26 * yz);
    //roof
    g.setColor (lightorange);
    int X[] = { (x + 6) * xz, (x + 113) * xz, (x + 60) * xz, (x + 6) * xz};
    int Y[] = { (y + 34) * yz, (y + 34) * yz, (y + 12) * yz, (y + 34) * yz};
    g.fillPolygon (X, Y, 4);
    g.setColor (Color.black);
    g.drawPolygon (X, Y, 4);
}


/**
Draw a new little house or clears the textfields
@param e The ActionEvent invoked. e.getActionCommand contains nothing or draw
*/
public void actionPerformed (ActionEvent e)
{
    //get new co-ordinates and draw the house
    if (e.getActionCommand ().equals ("draw"))
    {
        showStatus ("");
        try
        {
            x = Integer.parseInt (tx.getText ());
            y = Integer.parseInt (ty.getText ());
            xz = Integer.parseInt (txscale.getText ());
            if (xz <= 0)
                xz = 1; //divide by zero, negative error check
            yz = Integer.parseInt (tyscale.getText ());
            if (yz <= 0)
```

```
                    yz = 1; //divide by zero, negative error check
                repaint ();
            }
            catch (java.lang.NumberFormatException error)
            { //if the user entered text, display an error message and clear the textfield
                showStatus ("Enter NUMBERS in the text fields. eg. 2. No decimals.");
                tx.setText ("1");
                ty.setText ("1");
                txscale.setText ("1");
                tyscale.setText ("1");
            }
        }
    }
}
```

C. Animal

Adapt the house program so that it draws an animal (using a polygon) on the screen and allows you to move it.

It does not need to scale in the X and Y direction.

