Introduction to Computer Science 2

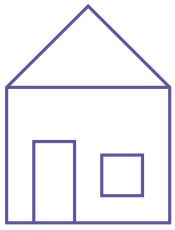
Lab 4: Programming Graphics

Learning Goals:

- To learn programming simple graphics in Java.
- To learn how to use classes `JComponent`.
- To learn the event-handling mechanism in Java and its main components.
- To learn how to write listener classes and how to install their objects.

Exercise 1 (3 points)

Write a program that draws a picture of a house. It could be as simple as the accompanying figure, or if you like, make it more elaborate.



Implement a class House and supply a method `draw(Graphics2D g2)` that draws the house.

Exercise 2 (3 points)

Write a program that displays the Olympic rings. Color the rings in the Olympic colors.

Provide a class `OlympicRingViewer` and a class `OlympicRingComponent`.

Exercise 3 (4 points)

Enhance the `ButtonViewer` program so that it has two buttons (see the code below), each of which prints a message "*I was clicked n time*". The value *n* should be incremented with each click.

```
import java.awt.event.ActionListener;
import javax.swing.JButton;
import javax.swing.JFrame;

/**
 * This program demonstrates how to install an action listener.
 */
public class ButtonViewer {
    public static void main(String[] args) {
        JFrame frame = new JFrame();
        JButton button = new JButton("Click me!");
        frame.add(button);

        ActionListener listener = new ClickListener();
        button.addActionListener(listener);
        frame.setSize(FRAME_WIDTH, FRAME_HEIGHT);
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        frame.setVisible(true);
    }

    private static final int FRAME_WIDTH = 100;
    private static final int FRAME_HEIGHT = 60;
}
```

```
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;

/**
 * An action listener that prints a message.
 */
public class ClickListener implements ActionListener {
    public void actionPerformed(ActionEvent event) {
        System.out.println("I was clicked.");
    }
}
```

Honor code, coding style, and deliverable:

Try to solve the exercises with what you already know. You are welcome to expand your program to do extra things but they are not mandatory.

Plagiarism is not allowed! We will run sophisticated software that automatically detects similarities on source code among students. All plagiarism incidents will be immediately reported to the Board of Examiners

Submission!

Submit your java files to Canvas.
Ask your instructor in case there is a problem with your submission.

DO NOT SEND SUBMISSIONS VIA EMAIL
YOUR LAB WILL NOT GET GRADED!