Task Six: Graphical User Interfaces

So far, you’ve been printing out values to the console at the bottom of your screen. However, programs often include graphics, and places for the user to interact with the program. This is where Graphical User Interfaces (GUIs) come in. In this task, you are going to make a program using a GUI.

For our graphics programs, we will use two separate files: A Driver and a Panel.

The driver is the program that controls everything. Like before, the driver has the main method. The driver also controls the Frame, which is where everything, including the panels, is put. We need to import Frame into the driver file:

import javax.swing.JFrame;

Every driver that we will use for UIs is pretty similar:

public class UI\_Test //Name of the class

{

public static void main(String[] args) //Main method

{

JFrame frame = new JFrame("Test"); //Create a Frame

frame.setSize(300, 300);

frame.setLocation(0, 0);

frame.setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

frame.setContentPane(new YOUR PANEL()); //Add YOUR panel

frame.setVisible(true);

}

}

Now onto the panel. The panel is where you put all of the objects that the user directly or indirectly interacts with. For now, we are going to use two objects: buttons and labels. Buttons are objects that the user can click, and have an action that results. Labels are objects that simply display text.

First, we have to import the classes we need to use:

import javax.swing.\*;

import java.awt.\*;

import java.awt.event.\*;

On the next page, you will find the structure of a basic panel.

public class GUI extends JPanel

{

private JButton button;

private JLabel label;

public GUI()

{

button = new JButton("test");

button.addActionListener(new Listener());

add(button);

label = new JLabel("");

add(label);

}

private class Listener implements ActionListener

{

public void actionPerformed(ActionEvent e)

{

label.setText("Hello World!");

}

}

}

If you look carefully, this example will show you how to create a new button and a new label.

New objects are added to the constructor of the panel. The panel is a class, just like any other. However, notice at the top, we say “extends JPanel”. This means that this new class we are making takes properties from the premade Java class JPanel.

Also, whenever you create a new button, you must attach it to an ActionListener. An ActionListener listens for an action to occur from the object you are connecting it to (in this case a button is pressed), and once this action has occurred, it does something else. In the example above, it changes the text on a label.

You should have everything you need from this example. However, if you have any questions, please ask a mentor or a volunteer.

Your task is on the next page.

Task:

Your task is to create a program that has at least four buttons, at least four labels, and at least one other Java Graphics Component (JTextBox, JTextField, JSlider, etc.) Find one on the API. Other than these requirements, you have some freedom to decide what you want your program to do. Have fun!

Good luck, and remember to ask if you have any questions.