Lab 1

In this lab we are going to extend the simple HelloWorld Java applet we created last week by adding a button to set the “Hello World” text. Here is what our new applet should look like (on the left) and the layout of the panels for the application (on the right):

Step 1. In your cpsc324 directory you created on ada, create two new files HelloWorld2.html and HelloWorld2.java. Using a text editor, e.g., pico, vi, emacs, joe, etc., edit the HelloWorld2.html file to contain:

```html
<html>
<body>
  <h1>The Hello World 2 Applet</h1>
  <applet code="HelloWorld2.class" width="300" height="45">
    Your browser doesn't support applets
  </applet>
</body>
</html>
```

Step 2. Again, in your cpsc324 directory, use a text editor to create the HelloWorld2.java file as follows. Create the following imports:

```java
import java.awt.Dimension;
import java.awt.event.ActionListener;
import java.awt.event.ActionEvent;
import javax.swing.Box;
import javax.swing.BoxLayout;
import javax.swing.JApplet;
import javax.swing.JButton;
import javax.swing.JLabel;
import javax.swing.JPanel;
import javax.swing.JTextField;
import javax.swing.SwingUtilities;
```
Your HelloWorld2 class should extend JApplet and also implement the ActionListener interface:

    public class HelloWorld2 extends JApplet implements ActionListener {

The class should have the following fields.

    /** for serializable */
    static final long serialVersionUID = 13L;
    /** the "set text" button */
    private JButton setTextButton;
    /** the text field widget */
    private JTextField textField;
    /** the label widget */
    private JLabel label;

It should also define a private non-static “createGUI()” method as follows. This method initializes the various GUI widgets: the label, the button, and the text field (for entering text). In addition, it creates two sub-panels that use a Java BoxLayout (layout manager) for placing the GUI widgets. The left side of the figure above shows the basic arrangement of the two sub-panels.

    /**
     * initialize the gui
     */
    private void createGUI() {
        // create the label widget
        label = new JLabel("Hello World!");
        label.setHorizontalAlignment(JLabel.CENTER);
        // create the button and textfield
        textField = new JTextField(label.getText(), 25);
        setTextButton = new JButton("Set Text");
        setTextButton.setActionCommand("set text");
        setTextButton.addActionListener(this);
        // create a sub-panel for the button and textfield
        JPanel textPanel = new JPanel();
        textPanel.setLayout(new BoxLayout(textPanel, BoxLayout.X_AXIS));
        textPanel.add(textField);
        textPanel.add(Box.createRigidArea(new Dimension(5, 0)));
        textPanel.add(setTextButton);
        // put it all together
        JPanel mainPanel = new JPanel();
        mainPanel.setLayout(new BoxLayout(mainPanel, BoxLayout.Y_AXIS));
        mainPanel.add(label);
        mainPanel.add(textPanel);
        getContentPane().add(mainPanel);
    }

You will also need to define an “actionPerformed(ActionEvent)” method to handle button clicks. This method is the only method in the ActionListener interface, and is called whenever a button is clicked that is registered with the listener (in this, the event listener is the HelloWorld2 class).

    public void actionPerformed(ActionEvent e) {
        if (e.getActionCommand().equals("set text"))
            label.setText(textField.getText());
    }
Finally, you need to create the “init()” method. This method defines an anonymous inner class that overrides the “run()” method in Runnable to call our “createGUI()” method.

```java
    public void init() {
        Runnable r = new Runnable() {
            public void run() {
                createGUI();
            }
        };
        try {
            SwingUtilities.invokeLater(r);
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
```

**Step 3.** Compile your HelloWorld2 class on ada using the command:

```
    javac HelloWorld2.java
```

**Step 4.** Test your applet to make sure it works by opening Internet Explorer and going to the URL:

```
    http://www.cs.gonzaga.edu/~<your-login>/cpsc324/HelloWorld2.html
```

**Step 5.** Extend the HelloWorld2 applet by adding a new button that clears the text in the label. The button should go the right of the button labeled “Set Text” and should be labeled “Clear”. Clicking this button should set the text label to the empty string.