# AWTUI - Declarations

```
import java.awt.* ;
import java.awt.event.* ;

public class AWTUI extends Frame {
    public Label celsiusField ;   // put current celsius reading here
    public Label kelvinField ;    // put current kelvin reading here

    /*
     * A Font object contains information on the font to be used to
     * render text.
     */
    private static Font labelFont =
        new Font(Font.SERIF, Font.PLAIN, 72) ;
```

# AWTUI - Constructor(1)

```
/*
 * Create and populate the AWTUI JFrame with panels and labels to
 * show the temperatures.
 */
public AWTUI() {
    super("Weather Station") ;

    /*
     * WeatherStation frame is a grid of 1 row by an indefinite
     * number of columns.
     */
    setLayout(new GridLayout(1,0)) ;
```

# AWTUI - Constructor (2)

```
/*
 * There are two panels, one each for Kelvin and Celsius, added to the
 * frame. Each Panel is a 2 row by 1 column grid, with the temperature
 * name in the first row and the temperature itself in the second row.
 */
/*
 * Set up Kelvin display.
 */
Panel panel = new Panel(new GridLayout(2,1)) ;
add(panel) ;

Label label = new Label("Kelvin");
label.setAlignment(Label.CENTER) ;
label.setFont(labelFont) ;
panel.add(label) ;

Label label = new Label("");
label.setAlignment(Label.CENTER) ;
label.setFont(labelFont) ;
panel.add(label) ;

kelvinField = label;

/*
 * Set up Celsius display. - (same as above, not shown in this slide)
 */
```

CODE SMELL !

Duplicated Code
aka “Cut & Paste Programming”

Extract into private method.

# AWTUI - Private Utility Method

```
    /*
     * Create a Label with the initial value <title>, place it in
     * the specified <panel>, and return a reference to the Label
     * in case the caller wants to remember it.
     */
    private Label setLabel(String title, Panel panel) {
        Label label = new Label(title) ;

        label.setAlignment(Label.CENTER) ;
        label.setFont(labelFont) ;
        panel.add(label) ;

        return label ;
    }
}
```

# AWTUI - Constructor (2a) – after refactoring

```
/*
 * There are two panels, one each for Kelvin and Celsius, added to the
 * frame. Each Panel is a 2 row by 1 column grid, with the temperature
 * name in the first row and the temperature itself in the second row.
 */

/*
 * Set up Kelvin display.
 */
Panel panel = new Panel(new GridLayout(2,1)) ;
add(panel) ;
setLabel(" Kelvin ", panel) ;
kelvinField = setLabel("", panel) ;

/*
 * Set up Celsius display.
 */
panel = new Panel(new GridLayout(2,1)) ;
add(panel) ;
setLabel(" Celsius ", panel) ;
celsiusField = setLabel("", panel) ;
```

# AWTUI – Design Principle: DRY

**In the Constructor**

```
setLabel(" Kelvin ", panel) ;
kelvinField = setLabel("", panel) ;
                .    .    .
setLabel(" Celsius ", panel) ;
celsiusField = setLabel("", panel) ;
```

**Private Method**

```
/*
 * Create a Label with the initial value <title>, place it in
 * the specified <panel>, and return a reference to the Label
 * in case the caller wants to remember it.
 */
private Label setLabel(String title, Panel panel) {
    Label label = new Label(title) ;

    label.setAlignment(Label.CENTER) ;
    label.setFont(labelFont) ;
    panel.add(label) ;

    return label ;
}
```

Code that would be duplicated

# AWTUI - Constructor(3)

```
    /*
     * Set up the window's default close operation and pack its elements.
     */
    addWindowListener(
            new WindowAdapter() {
                public void windowClosing(WindowEvent windowEvent){
                    System.exit(0);
                }
            });

    /*
     * Pack the components in this frame and make the frame visible.
     */
    pack() ;
    setVisible(true) ;
}
```