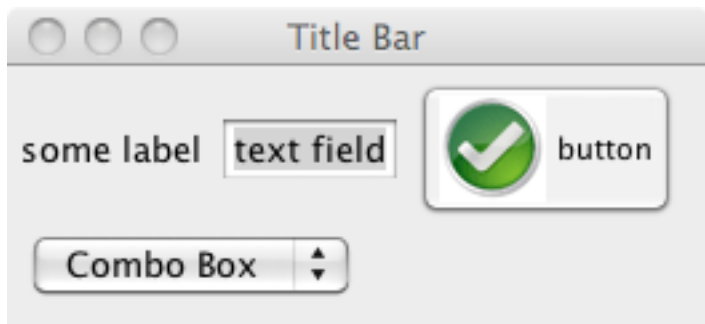


GUI



Java Foundation Classes (JFC) include:

- ▶ Abstract Window Toolkit (AWT) \Rightarrow OS Windows & Events
- ▶ Java Swing: More uniform, almost pure Java window objects

Event Driven

Components “listen” for events

AWT can capture events

Swing can draw components

Let's draw

```
import javax.swing.*;
public class GUI1
{
    public static void main(String[] a)
    {
        final int WINDOW_WIDTH = 350;
        final int WINDOW_HEIGHT = 250;

        // create a window
        JFrame window = new JFrame();

        // set the title
        window.setTitle("A simple window");

        // set the size
        window.setSize(WINDOW_WIDTH, WINDOW_HEIGHT);

        // Specify the close behavior
        window.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

        //Display the window
        window.setVisible(true);
    }
}
```

Adding Objects

- ▶ You can only add one object at a time
- ▶ JPanel can group objects to add a bunch

Adding Objects

```
import javax.swing.*;
public class GUI1
{
    public static void main(String[] a)
    {
        final int WINDOW_WIDTH = 350;
        final int WINDOW_HEIGHT = 250;

        // create a window
        JFrame window = new JFrame();

        // create a text field
        JTextField input = new JTextField();

        // set the title
        window.setTitle("A simple window");

        // adding text field
        window.add(input);

        // set the size
        window.setSize(WINDOW_WIDTH,WINDOW_HEIGHT);

        // Specify the close behavior
        window.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

        //Display the window
        window.setVisible(true);
    }
}
```

Adding Components

Oops... too big. What if we add something else?

Adding Components

JPanel

JPanel can group objects

JPanel can be added as one element to a JFrame

JPanel can be extended

Handling Events

AWT listens for events
(import java.awt.event.*;)

Each object that's activated by an event needs an event listener

A listener is a class (inner) that *implements* a Listener¹

¹Implements is *like* extends

Quick Intro to Inner Classes

Pseudo code:

```
public class MyClass
{
    // some variables
    var 1;
    var 2;
    // some code
    method1();

    // an inner class
    private class MyInnerClass
    {
        // some code that
        // can use vars 1,2, and methods1.
        // and can have other methods.
    }
}
```

Adding an Event Listener

```
private class myConvertBtnListener implements ActionListener
{
    public void actionPerformed(ActionEvent e)
    {
        double tempF = Double.parseDouble(taFahrenheit.getText());
        double tempC = (tempF-32)*5/9;
        lResult.setText(""+tempC);
    }
}
```