Java GUIs

Made up of visual components
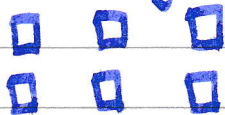
1) Button, Lists, Text Fields, Checkboxes, Scroll arrows, Radio Buttons, Drop-down menus

2) Containers - Window/Frame and Panels

3) Events - Mouse click, key press

All events must have a listener object attached
Listeners are implemented with interfaces

Purely an abstract class

set Layout

FlowLayout (Default for panels)

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Most common,
Row by row based
on window size

retrieves name on
button
String label = evt. get Action Command
if (label.equals (" My Button"))

Other layouts (Default for frame/windows)
- BorderLayout
- GridLayout
- BoxLayout
- GridbagLayout

Creating Event Listeners

Listener interfaces for high-level events

Interface Name *Required Method*

ActionListener `actionPerformed(ActionEvent evt)`

button press

AdjustmentListener `adjustmentValueChanged(AdjustmentEvent evt)`

(scroll arrows)

ItemListener `itemStateChanged(ItemEvent evt)`

checkboxes

TextListener `textValueChanged(TextEvent evt)`

Example of an interface Definition

Listeners are purely abstract classes

```
public interface ActionListener extends EventListener {
    public void actionPerformed(ActionEvent evt);
}
```

method has no body and is abstract by default

Using Event Listeners and Adapter Classes
in the Abstract Window Toolkit

Button object   ButtonListener object

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

public class ButtonTest {
    public static void main(String[] args) {
        Frame f = new ButtonTestFrame("Button Test");
        f.setSize(150, 100);
        f.setVisible(true);

    }
}

class ButtonTestFrame extends Frame {
    public ButtonTestFrame(String title) {
        super(title);
        setLayout(new FlowLayout());
        Button b = new Button("Close window");
        add(b);
        b.addActionListener(new ButtonListener());

        addWindowListener(new WindowCloser());
    }
}

class ButtonListener implements ActionListener {
    public void actionPerformed(ActionEvent evt) {
        System.exit(0);
    }
}

class WindowCloser extends WindowAdapter {
    public void windowClosing(WindowEvent evt) {
        System.exit(0);
    }
```

(Handwritten annotations:) derived class · title bar · Object · add · addwindowlistener ← Container · setLayout · Frame · ButtonTest Frame

Button Test _ □ X
Close window

```java
}
```