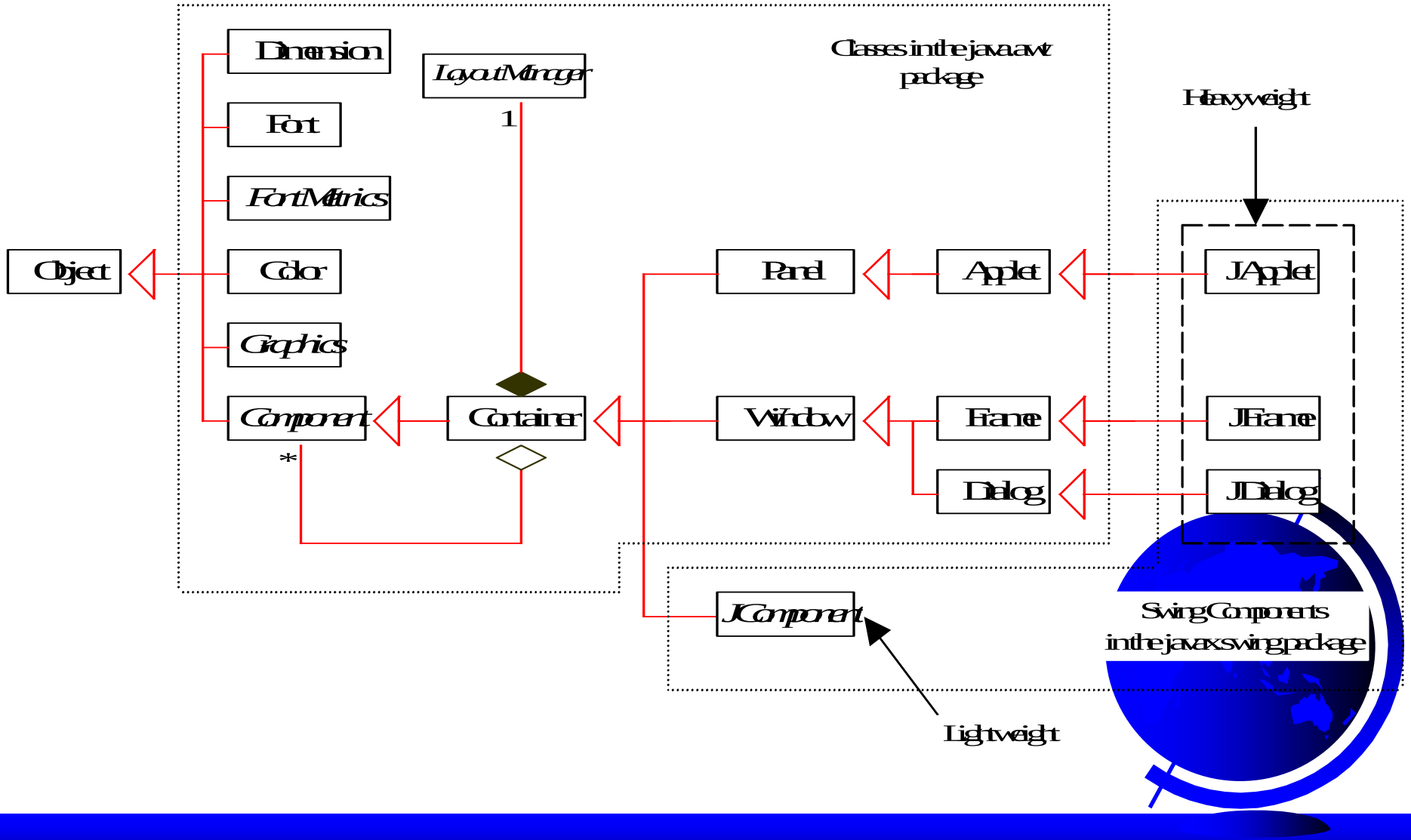
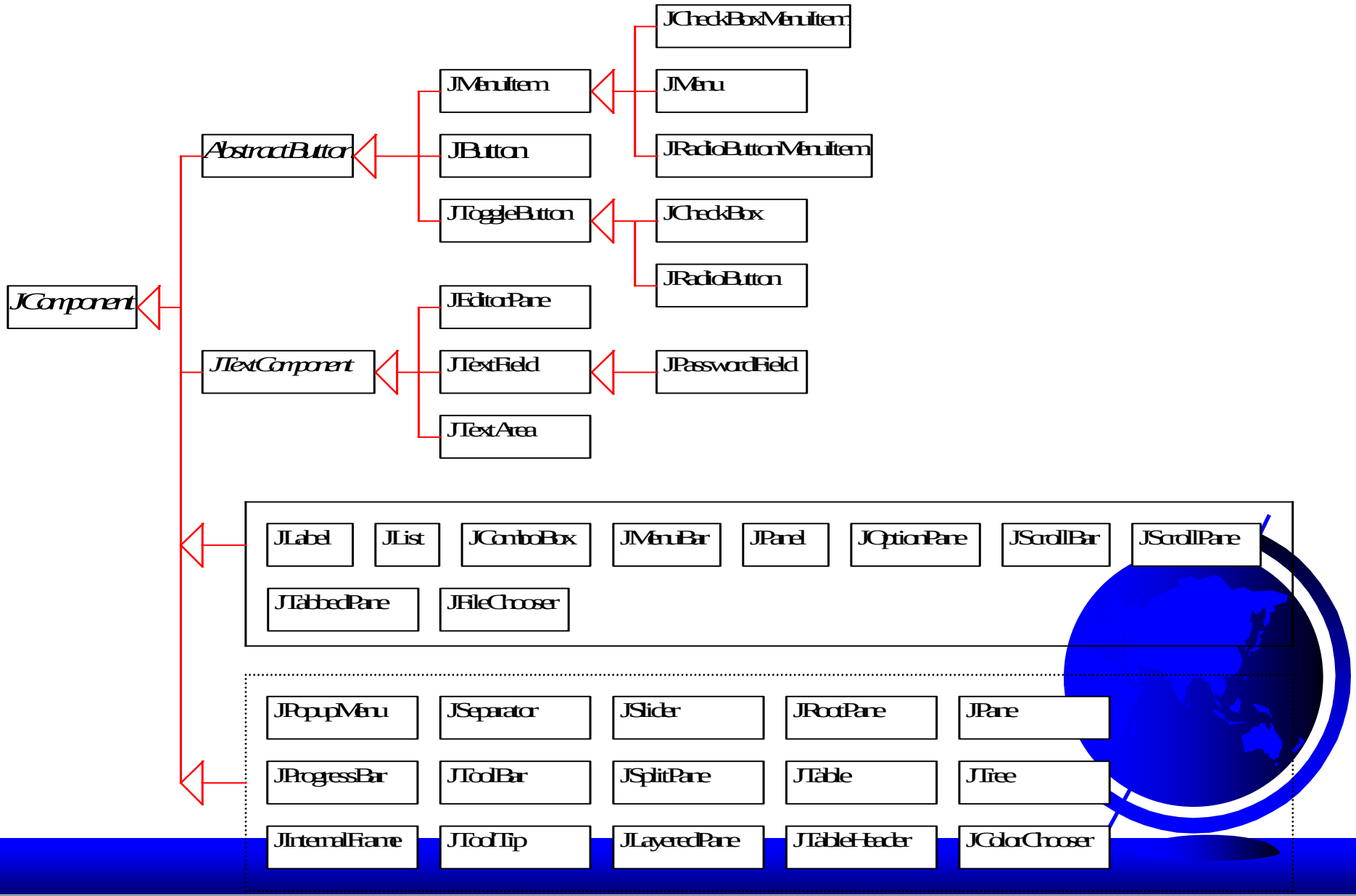
Chapter 10 Getting Started with GUI Programming

- Event Source, Listener, Listener Interface

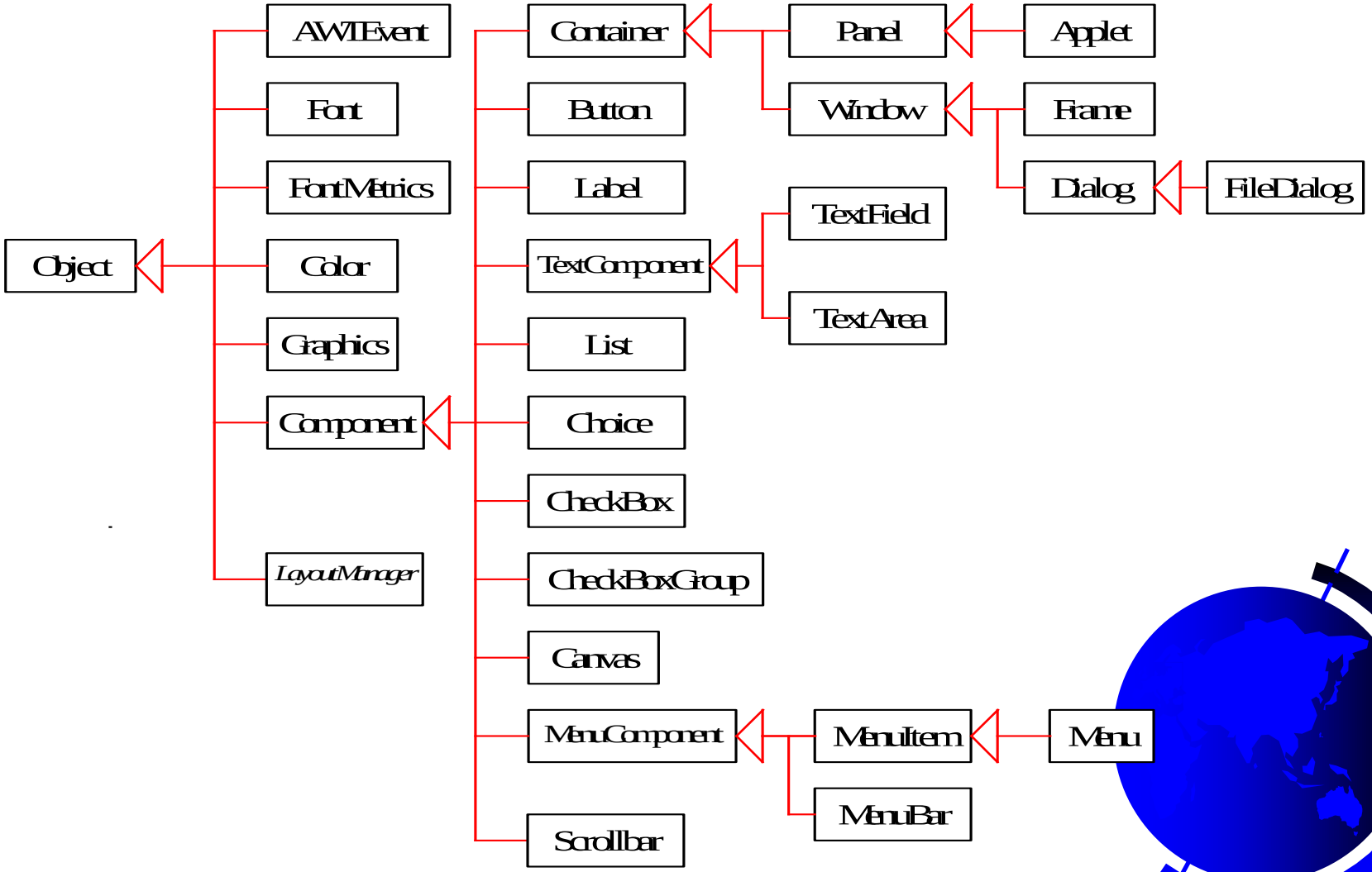
GUI Class Hierarchy (Swing)



JComponent


JCheckBoxMenuItem
JMenuItem
JMenu
AbstractButton
JButton
JRadioButtonMenuItem
JToggleButton
JCheckBox
JComponent
JRadioButton
JEditorPane
JTextComponent
JTextField
JPasswordField
JTextArea
JLabel
JList
JComboBox
JMenuBar
JPanel
JOptionPane
JScrollBar
JScrollPane
JTabbedPane
JFileChooser
JPopupMenu
JSeparator
JSlider
JRootPane
JPane
JProgressBar
JToolBar
JSplitPane
JTable
JTree
JInternalFrame
JToolTip
JLayeredPane
JTableHeader
JColorChooser

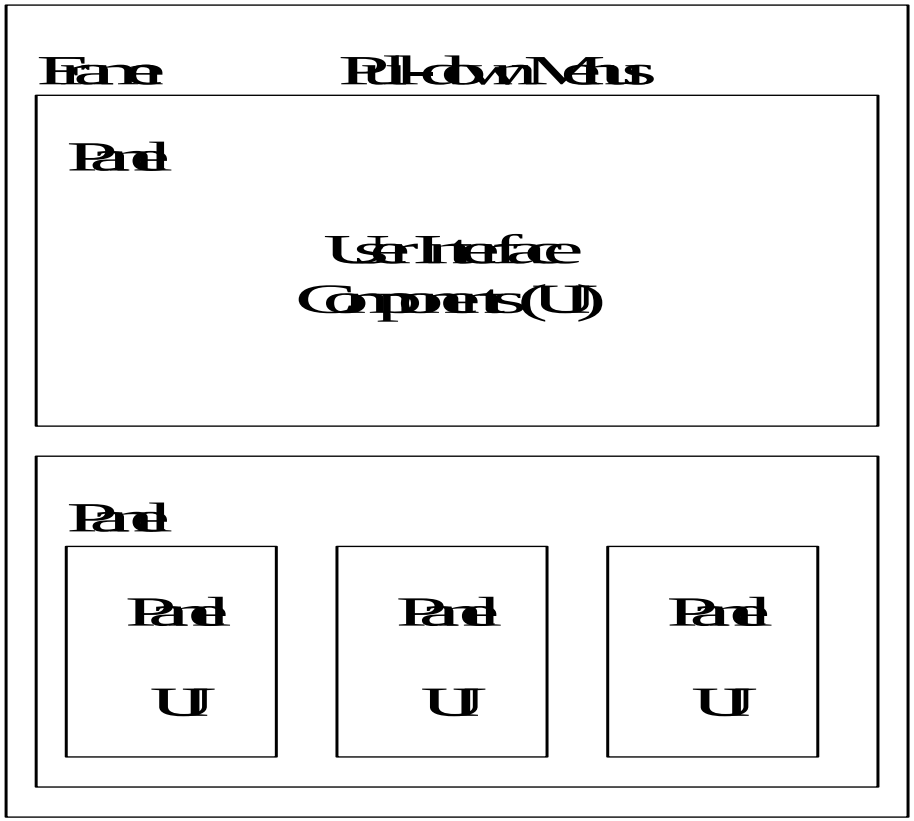
AWT (Optional)

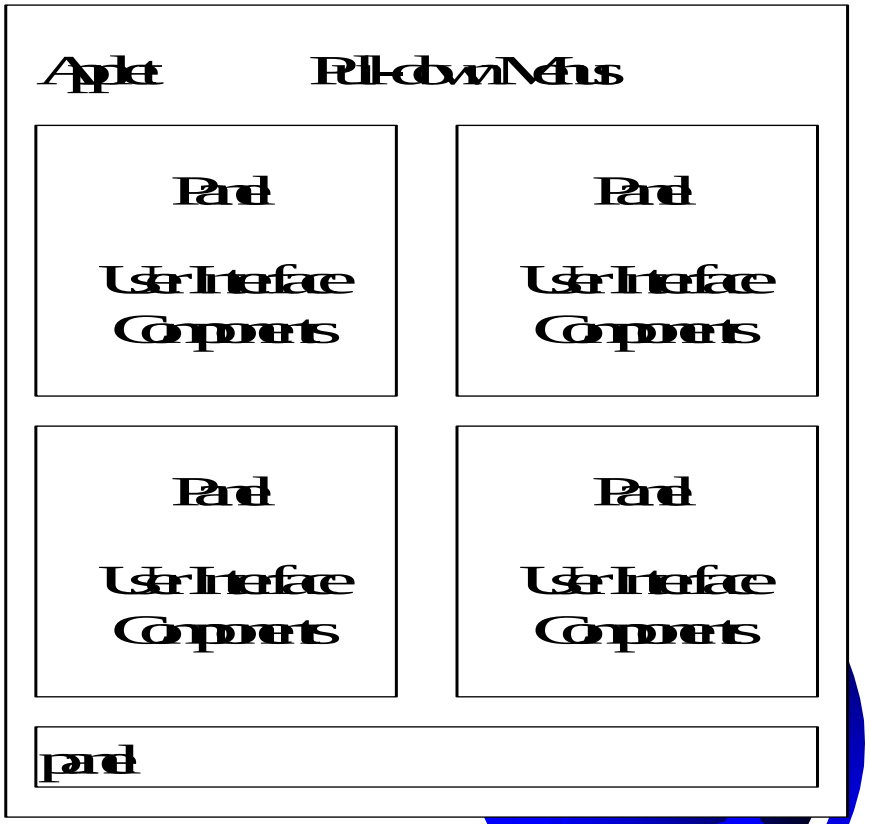


Frames

JFrame class to create

UI Components

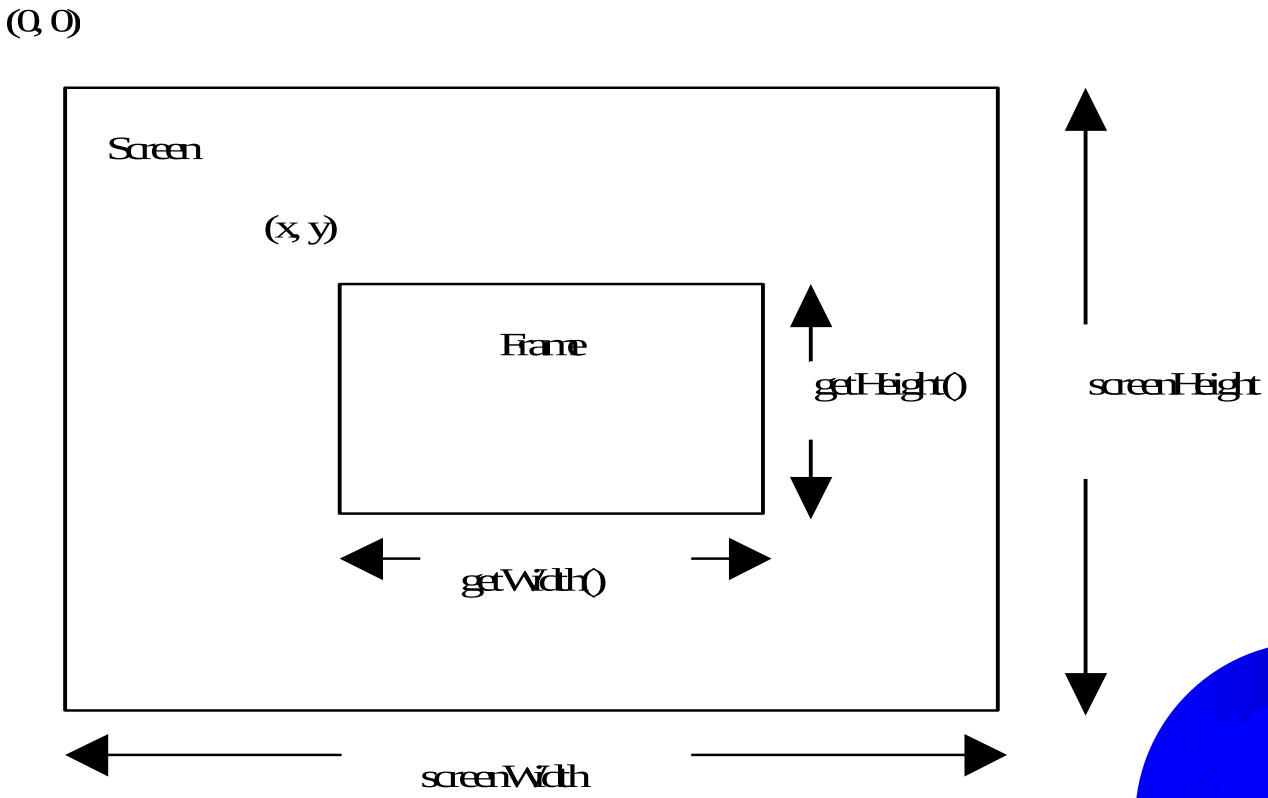




Creating Frames

Centering Frames

Centering Frames, cont.



CenterFrame

Run

Adding Components into a Frame

MyFrameWithComponents

Run

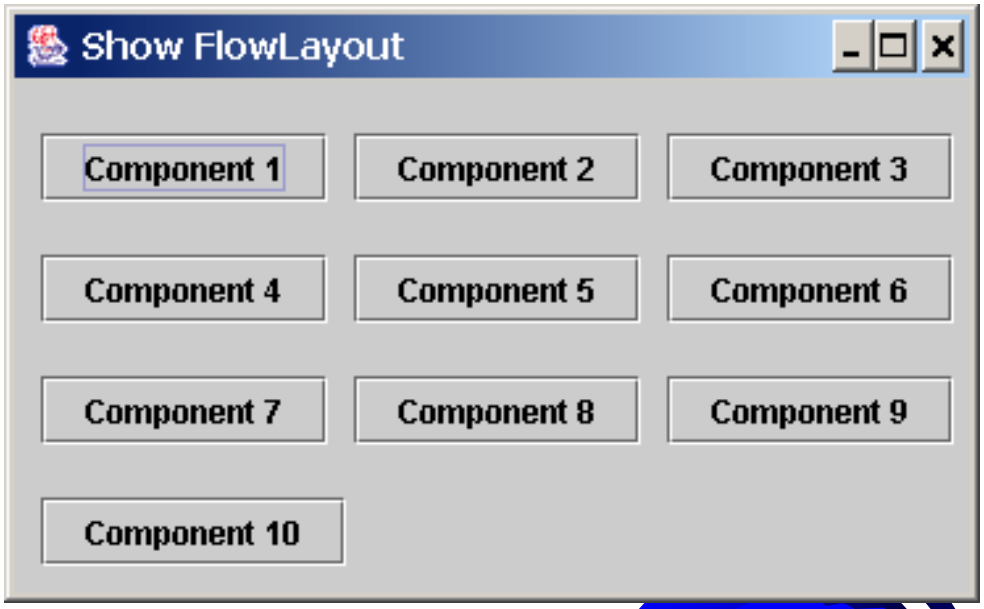
NOTE

is created. It is created when a

Layout Managers

Kinds of Layout Managers

Example 10.1
Testing the `FlowLayout` Manager



ShowFlowLayout

Run

`FlowLayout` Constructors

Example 10.2
Testing the `GridLayout` Manager

ShowGridLayout

Run

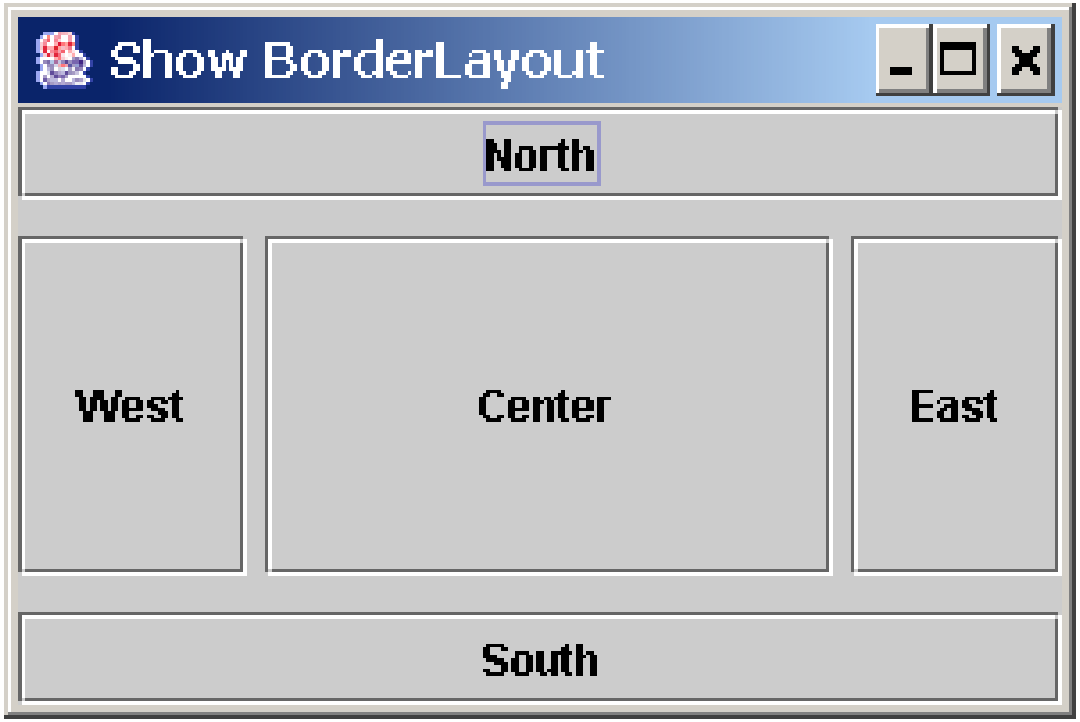
`GridLayout` Constructors

Example 10.3
Testing the `BorderLayout` Manager

ShowBorderLayout

Run

Example 10.3, cont.

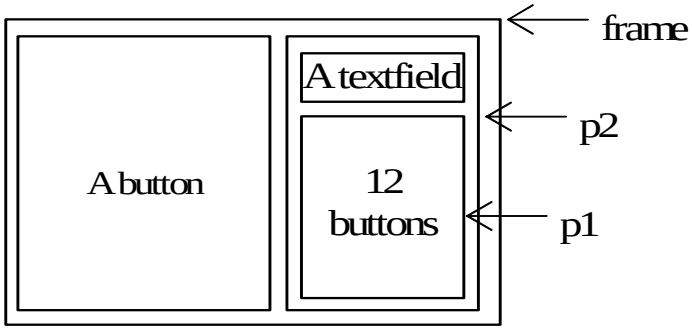


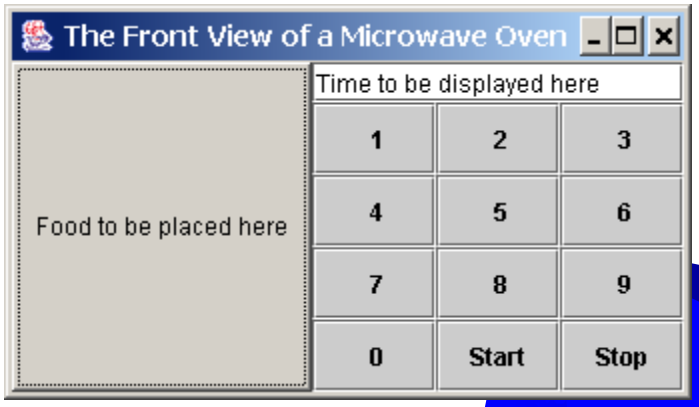
ShowBorderLayout

Run

Using Panels as Containers

Example 10.4 Testing `Panel`





TestPanels

Run

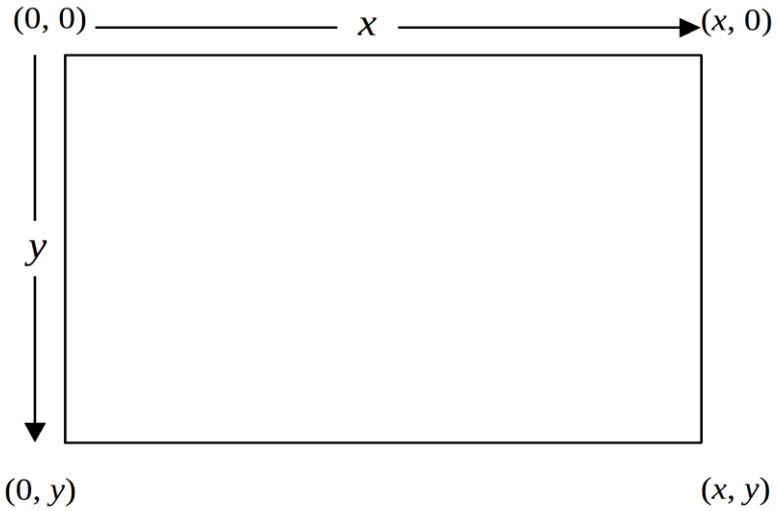
Drawing on Panels

Drawing on Panels, cont.

```
public void paintComponent(Graphics g) {
  super.paintComponent(g);

  g.drawString("Welcome to Java!", 40, 40);
}
```

Drawing on Panels, cont.



NOTE

platform. The Graphics class

NOTE

redisplayed.

Invoking

The image cannot be displayed. Your computer may not have enough memory to open the image, or the image may have been corrupted. Restart your computer, and then open the file again. If the red x still appears, you may have to delete the image and then insert it again.

NOTE

The `Color` Class

Setting Colors

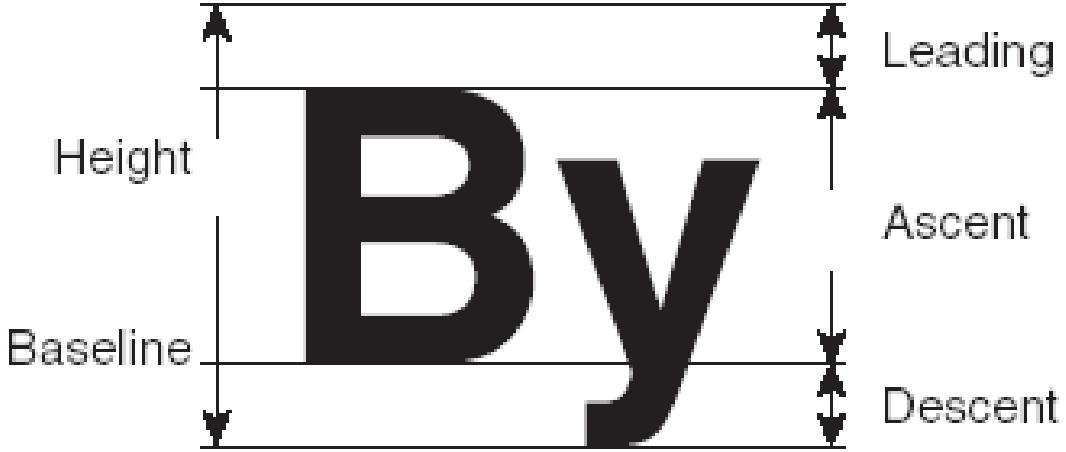
The `Font` Class

Finding All Available Font Names

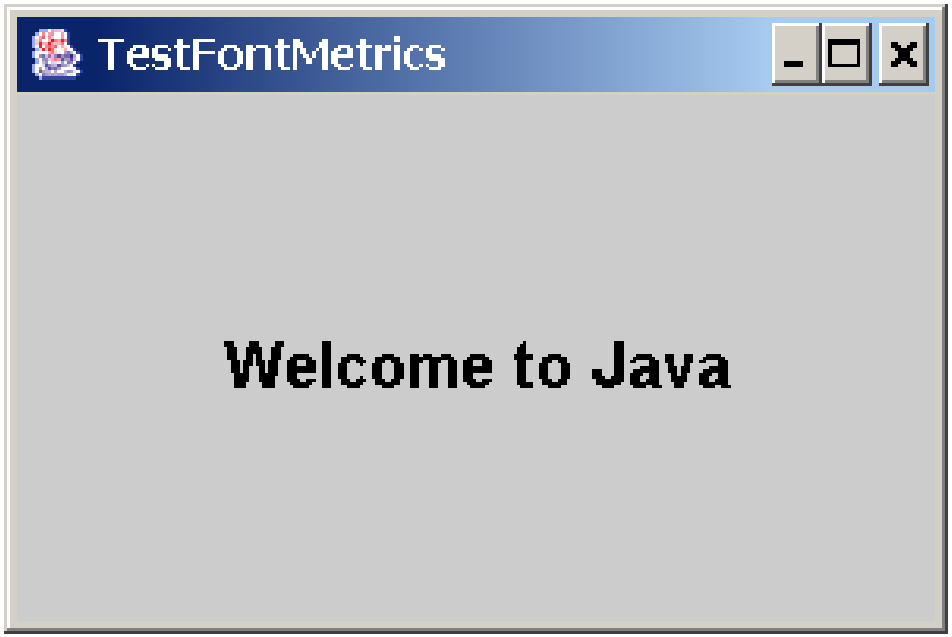
Setting Fonts

The `FontMetrics` Class

Get FontMetrics



Example 10.5
Using `FontMetrics`



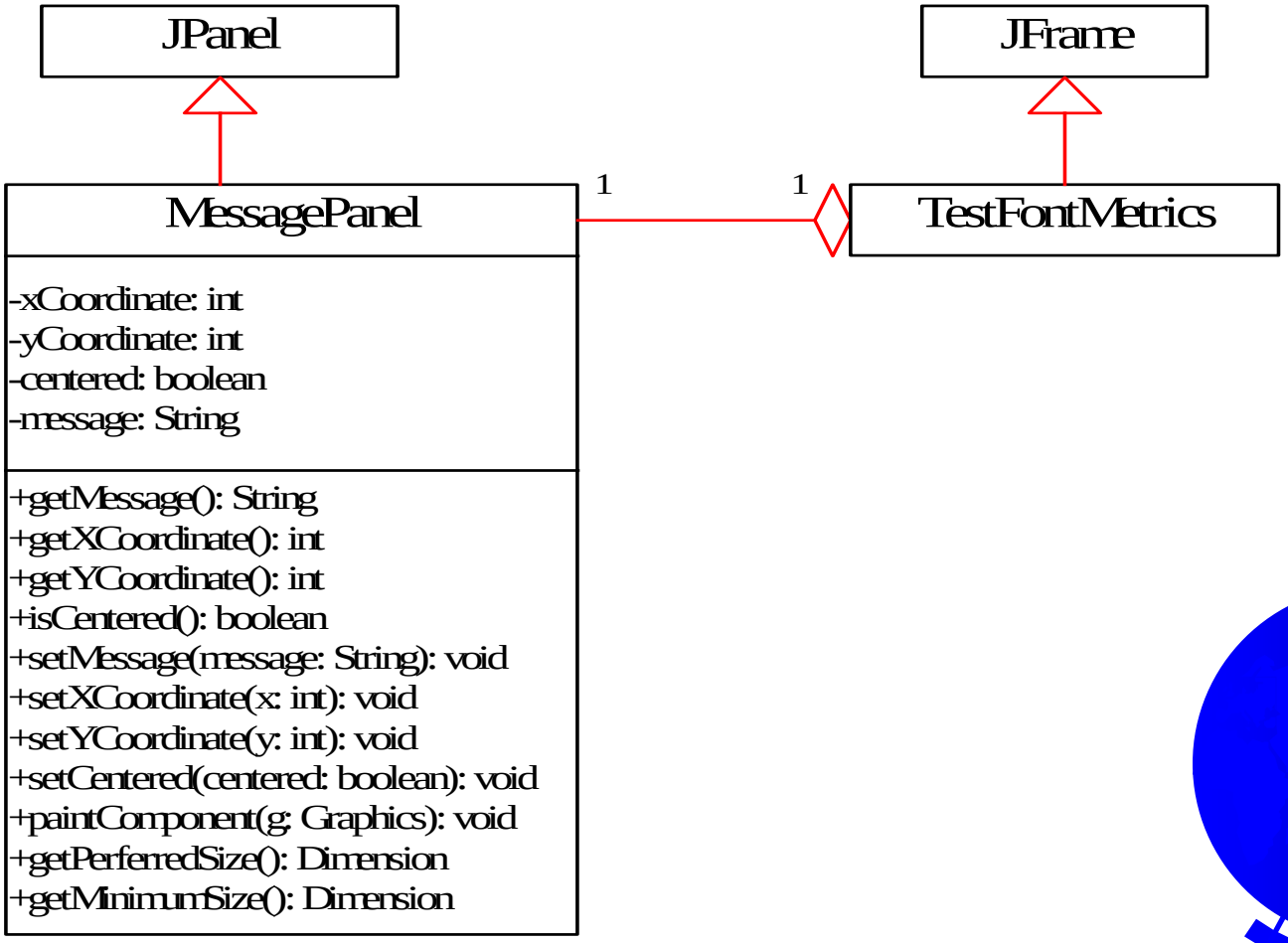
TestFontMetrics

MessagePanel

Run

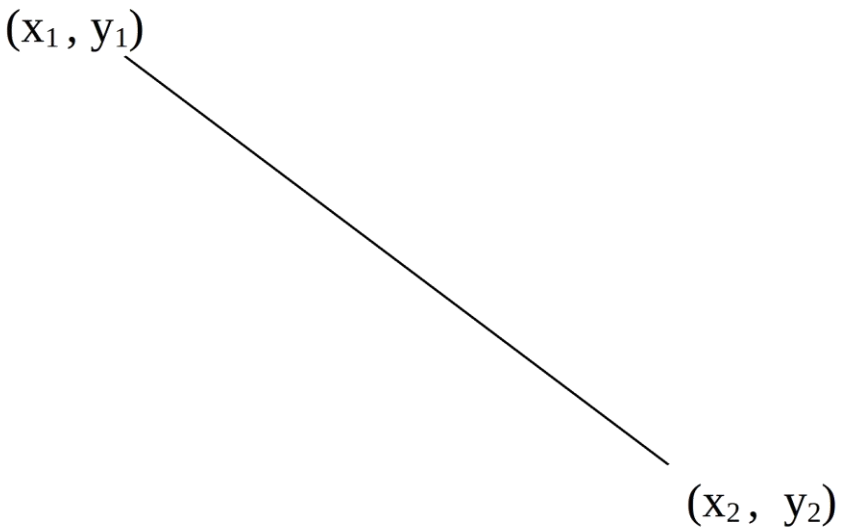

messagePanel
getHeight()
stringWidth
stringAscent
Welcome to Java
getWidth()

Example 10.5, cont.



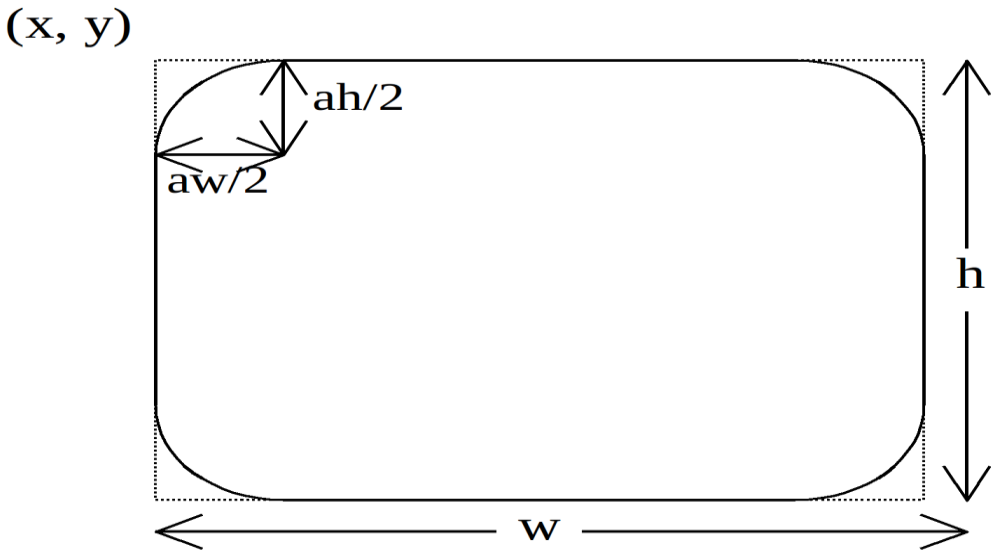
Drawing Geometric Figures

Drawing Lines

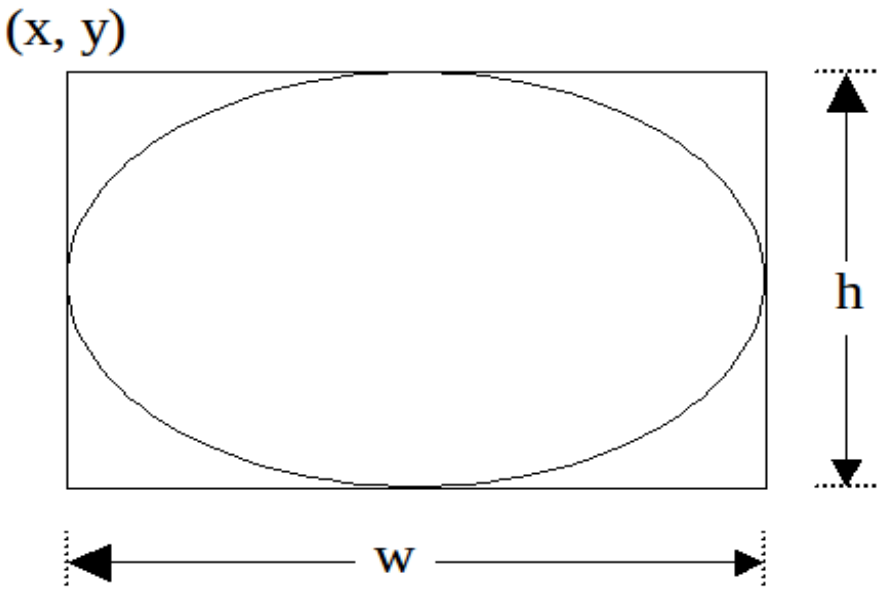


Drawing Rectangles

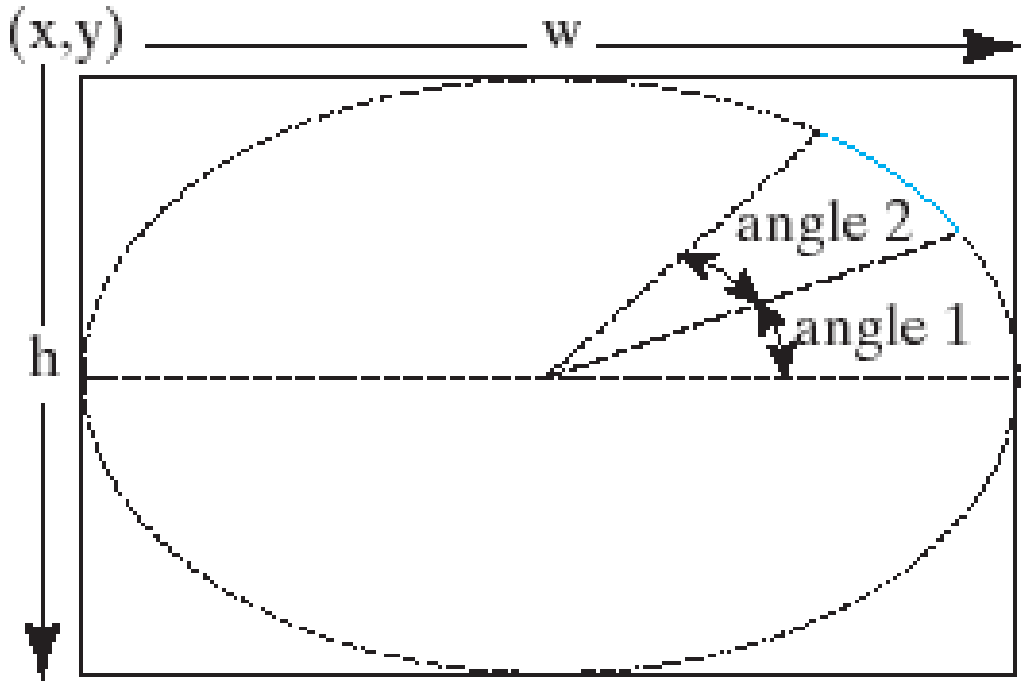
Drawing Rounded Rectangles



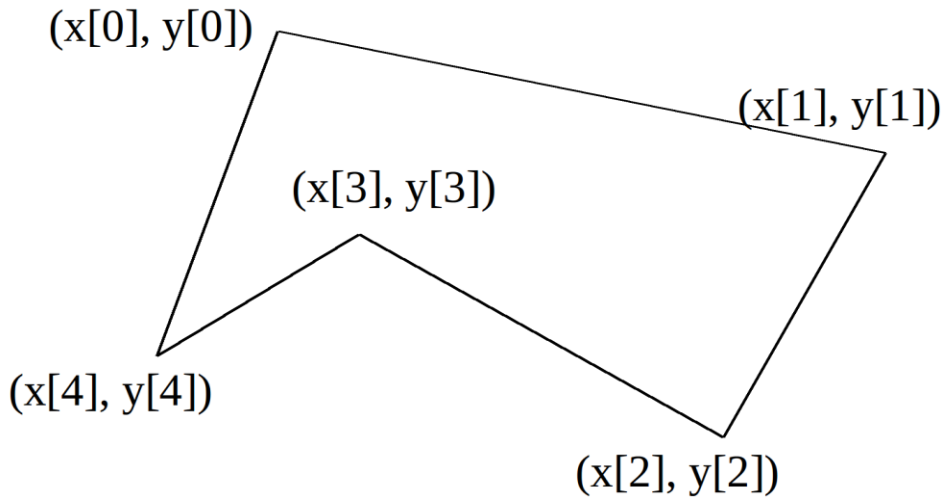
Drawing Ovals



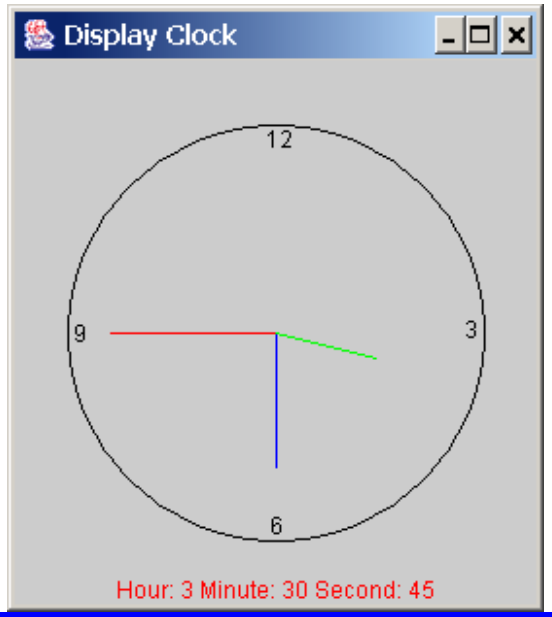
Drawing Arcs



Drawing Polygons



Example 10.6
Drawing a Clock



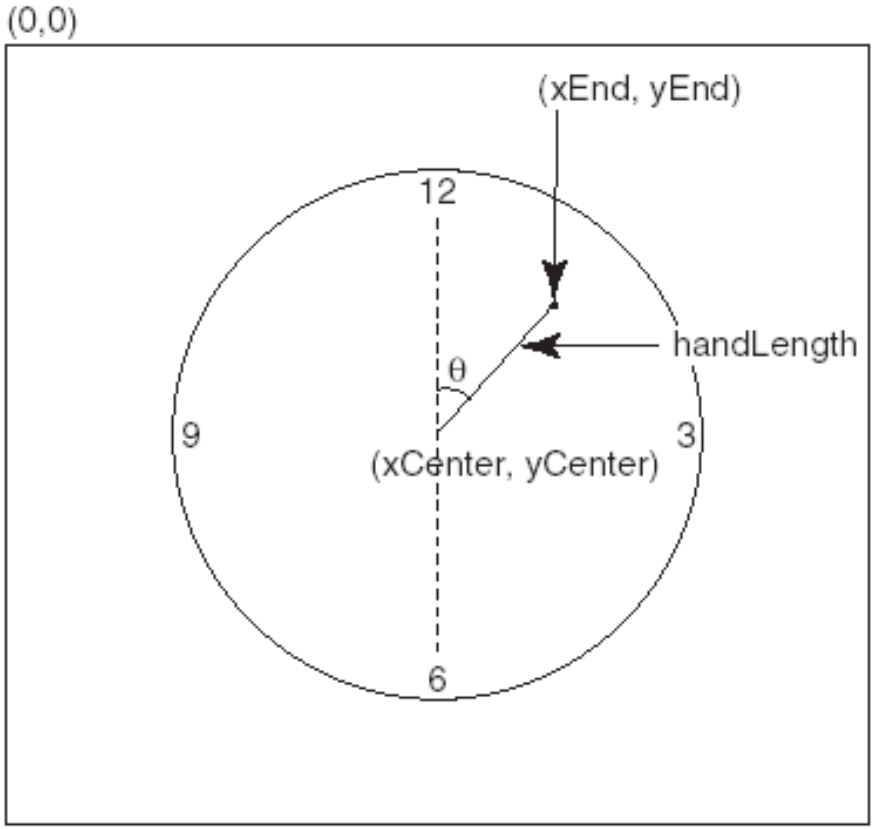
DrawClock

DisplayClock

Run

Drawing Clock

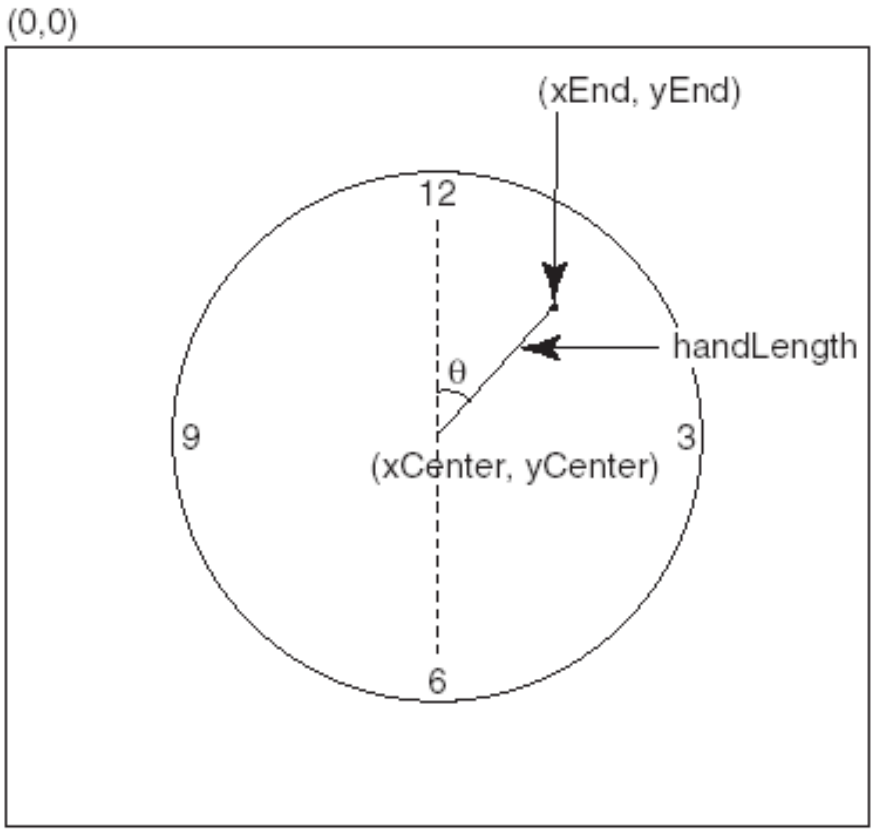
Since there are sixty seconds in one minute, the angle for the second hand is



Drawing Clock, cont.

The position of the minute hand is determined by the minute and second. The exact minute value comined with seconds is minute + second/60. For example, if the time is 3 minutes and 30 seconds. The total minutes are 3.5. Since there are sixty minutes in one hour, the angle for the minute hand is

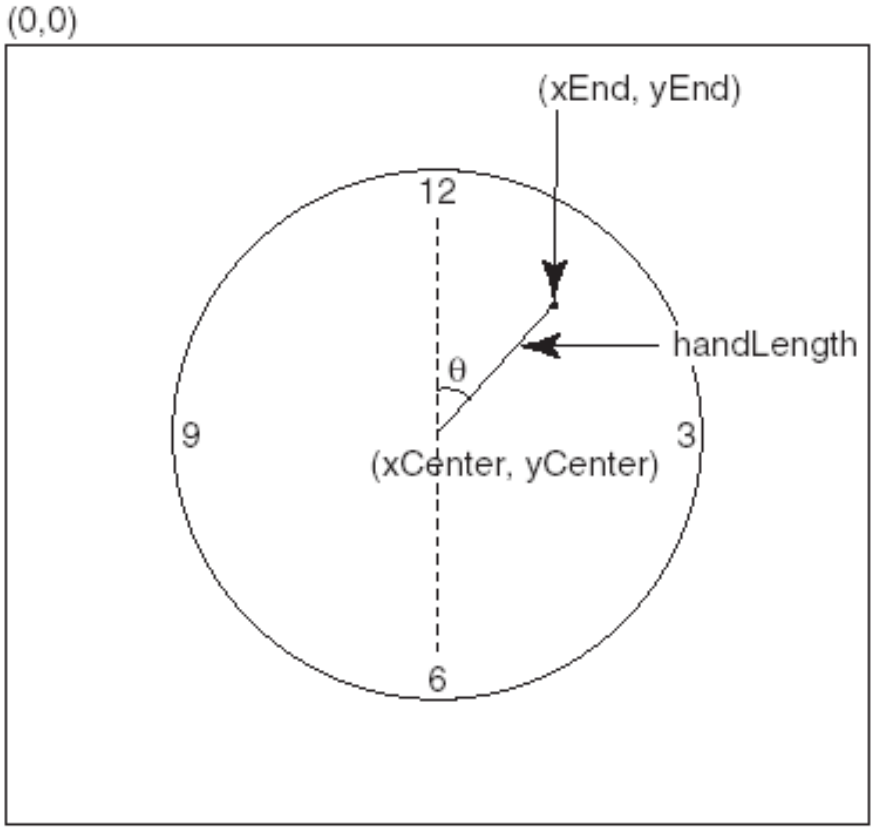
```
(minute + second/60) ×
(2π/60)
```



Drawing Clock, cont.

Since one circle is divided into twelve hours, the angle for the hour hand is

```
(hour + minute/60 +
second/(60 × 60))) ×
(2π/12)
```

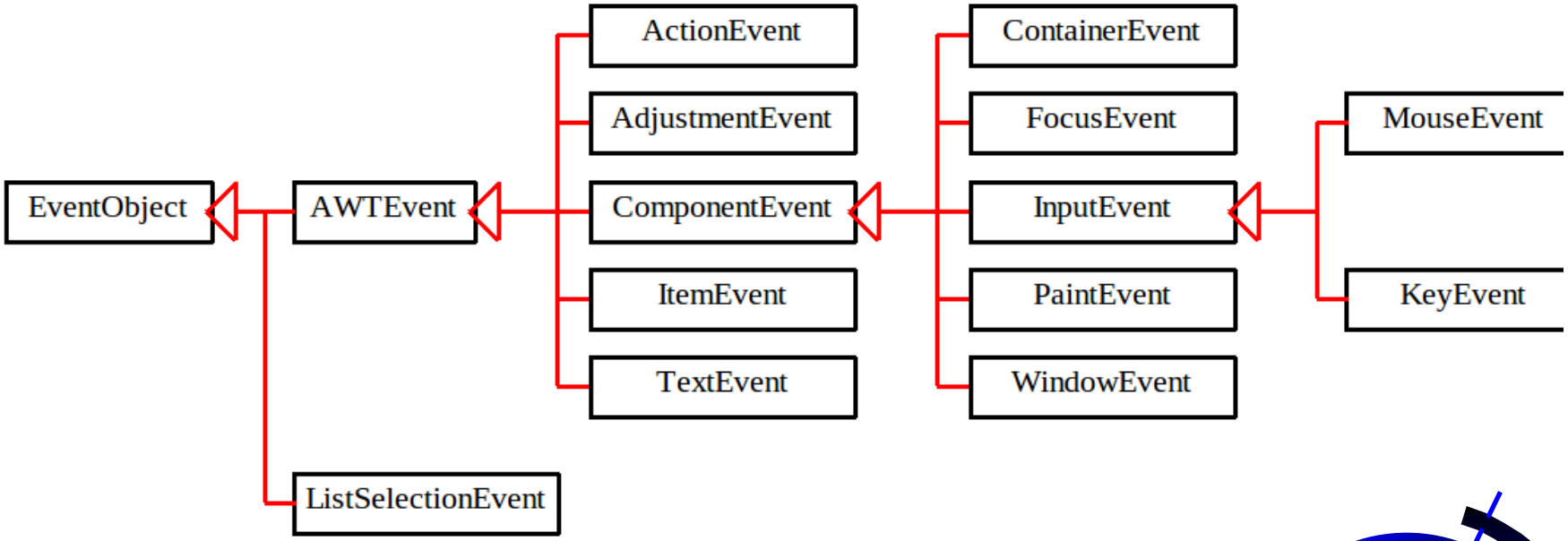


Event-Driven Programming

Events

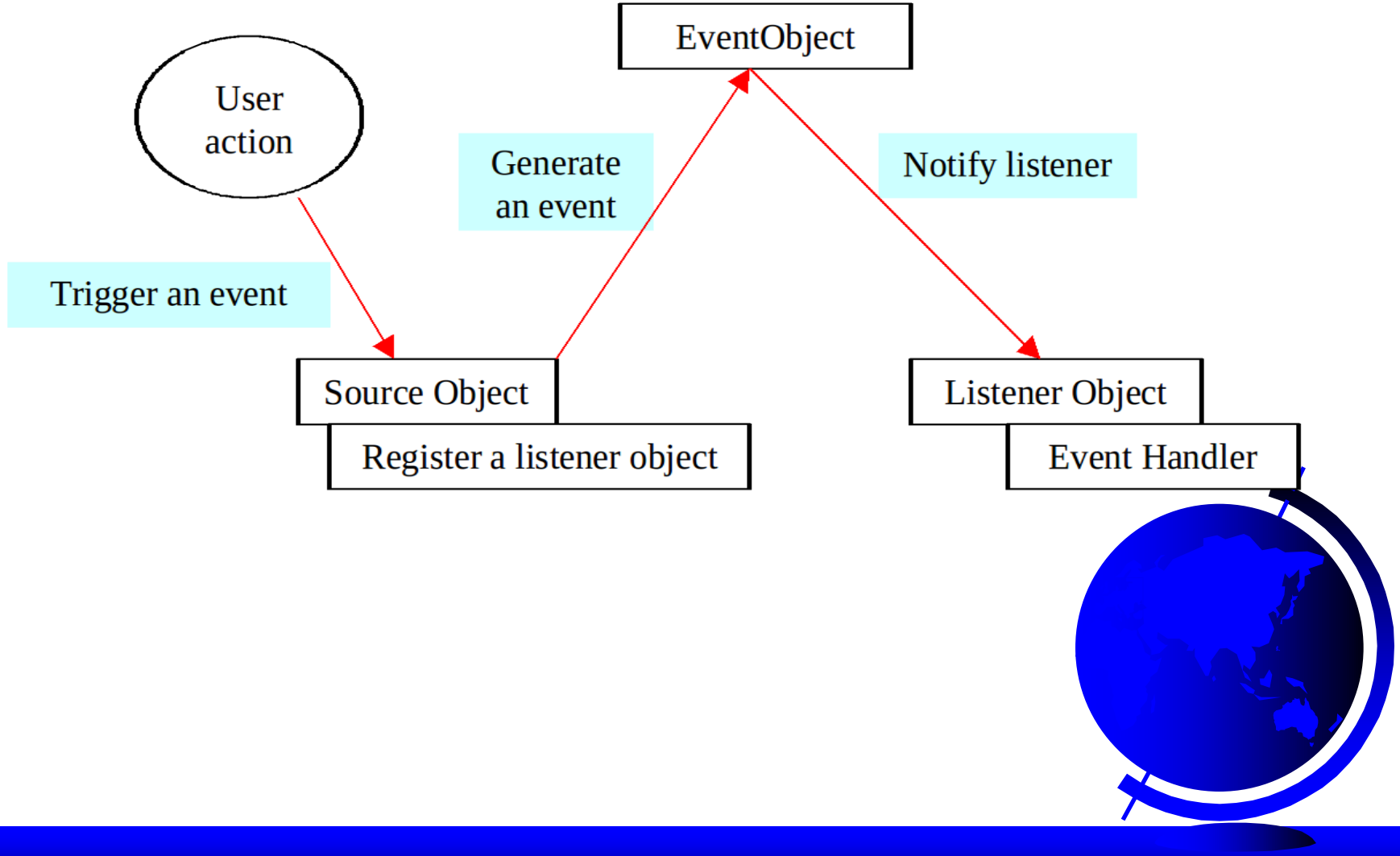
Event Information

Event Classes



Selected User Actions

The Delegation Model



Selected Event Handlers

Example 10.7
Handling Simple Action Events

TestActionEvent

Run

Example 10.8
Handling Window Events

TestWindowEvent

Example 10.9 Multiple Listeners for a Single Source

TestMultipleListener