Chapter 12

GUI Objects and Event-Driven Programming

OBJECTIVES
After you have read and studied this chapter, you should be able to

- Write GUI application programs using Frame, Dialog, and Button objects from the java.awt package.

- Write GUI application programs with menus using Menu, MenuItem, and MenuBar objects from the java.awt package.

- Write event-driven programs using Java's delegation-based event model.

- Write GUI application programs that process mouse events.

- Run applets as applications.

FIGURE 12.1   Various GUI objects from the **java.awt** package.

MenuBar

Menu

MenuItem

Label

Button

Frame

TextField

Dialog

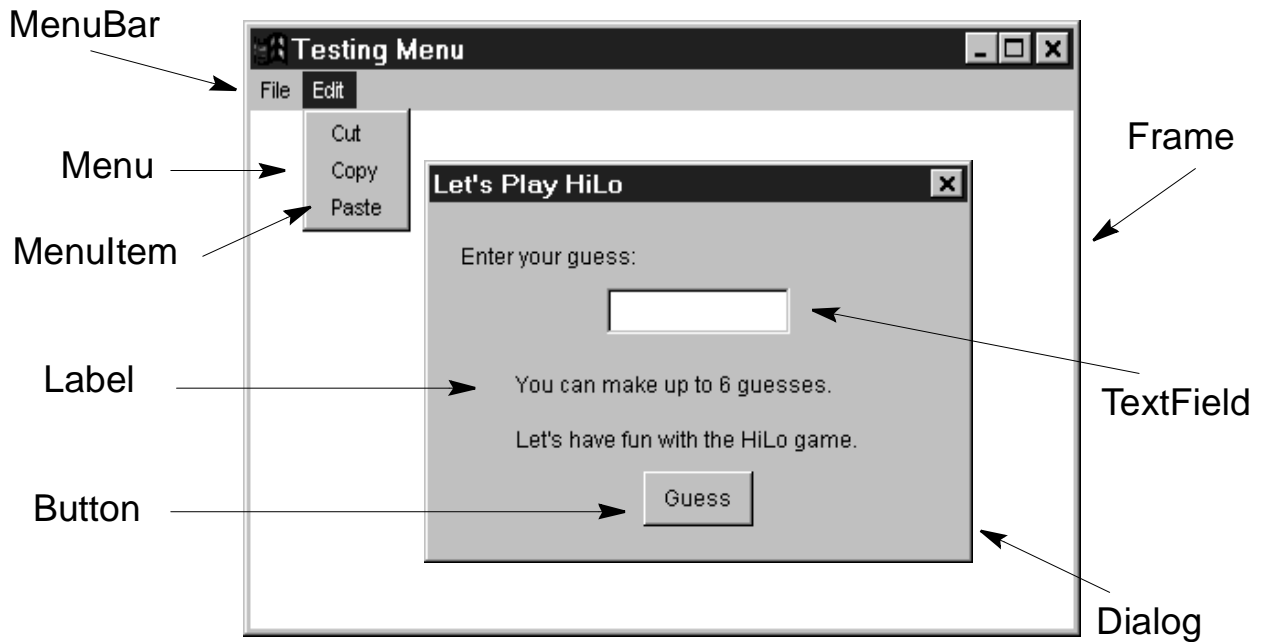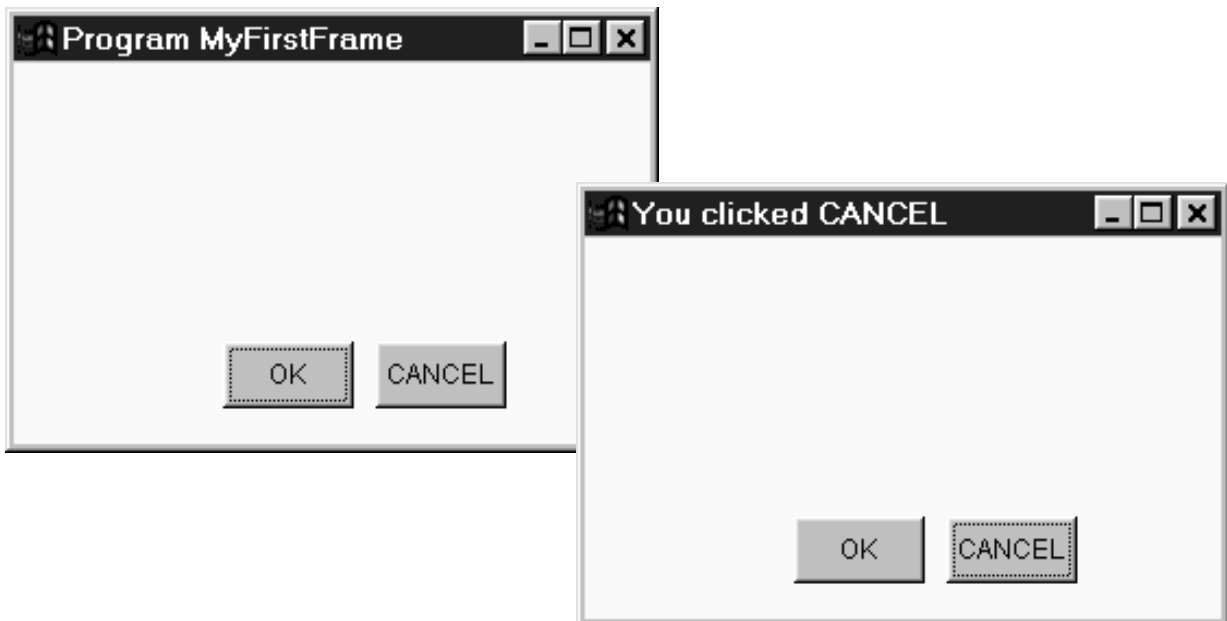FIGURE 12.2   A sample window when it is first opened and after the **CANCEL** button is clicked.

Postioning and sizing of a frame

```
frame = new Frame();
frame.setSize(300,200);
frame.setLocation(150, 250 );
```
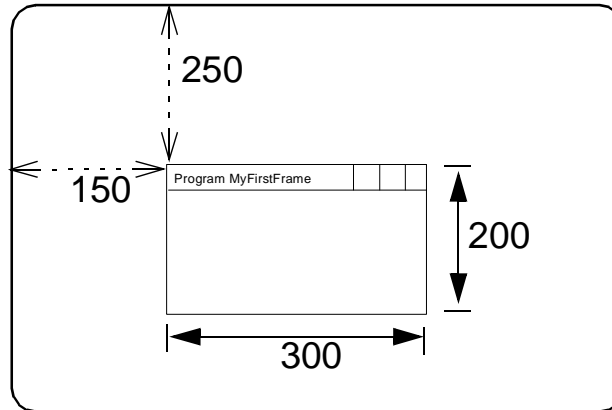

250

150

Program MyFirstFrame

200

300

FIGURE 12.3   The diagram illustrating how the **setBounds** method works.

```
frame = new Frame();
frame.setSize(300,200);
frame.setLayout( null );
okButton = new Button("OK");
okButton.setBounds(100, 150, 60, 30);
```
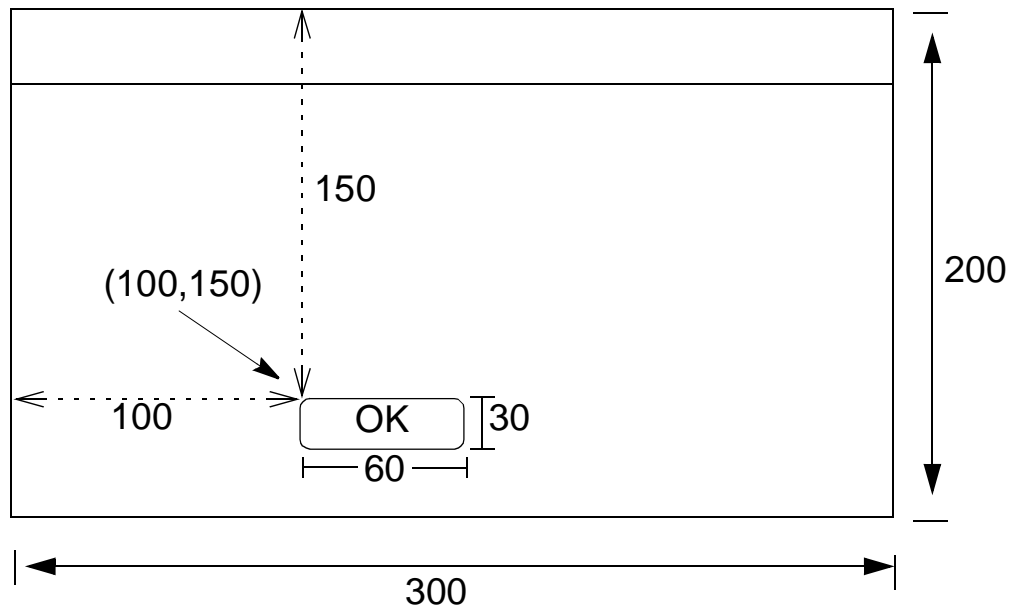

150

(100,150)

100

OK   30

60

200

300

FIGURE 12.4   **MenuFrame** window when it is first opened and after the menu item **Save** is selected.

FIGURE 12.5   Difference between the container (window) bounds and the inset values. The inner rectangle shows the drawing area and the outer rectangle shows the window. The area between the two includes things such as the window title, scroll bars, window borders, and so forth.
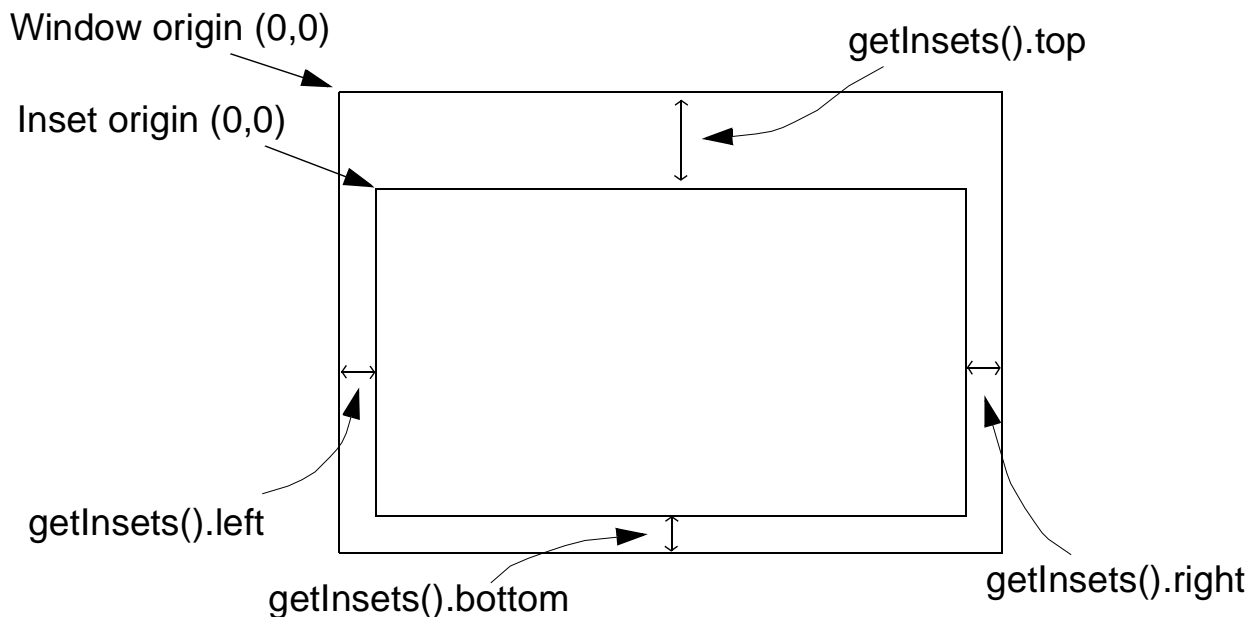
FIGURE 12.6   The class hierarchy for some of the commonly used GUI classes. Notice how the **Applet** class is related to the **java.awt** package and all classes inherit from the **Object** class.

Object   java.lang

java.awt

Component   MenuComponent

Button   Container   Label   TextComponent   MenuItem   MenuBar

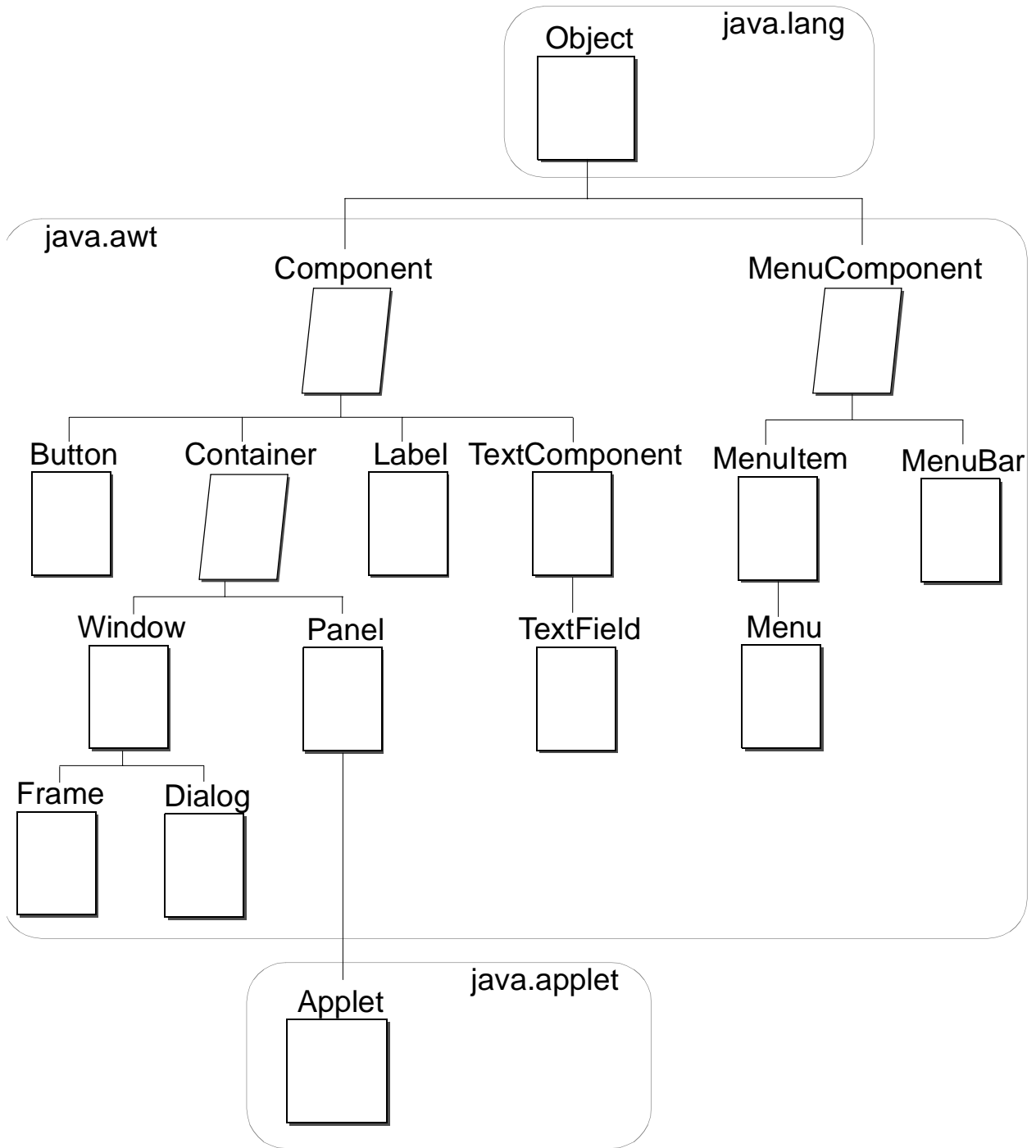Window   Panel   TextField   Menu

Frame   Dialog

Applet   java.applet

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FIGURE 12.7   A four-function calculator.