

EVENT HANDLING

Event (Java Classes)

An event is an object that describes a state change in the **source**.

Eg:- clicking a button, entering a character via the keyboard, selecting an item in a list, and clicking the mouse.

Event Source – GUI Components (Java classes)

A source is an object that generates an event. Sources may generate more than one type of event.

Eg:- Label, Button, Checkbox, TextBox, Radio Button, Drop Down list

A source must register listeners so that the listeners receive notifications about a specific type of event.

Event Listeners – (Java Interfaces)

A listener is an object that is notified when an event occurs.

It has two major requirements.

1. It must have been registered with one or more sources to receive notifications about specific types of events.
2. It must implement methods to receive and process these notifications.

The Delegation Event Model (Event source delegates the Event to the Event Listener)

1. A source generates an event and sends it to one or more listeners. The listener waits until it receives an event.
2. Once an event is received, listener will process the event and then returns.

AWT – Abstract Window Toolkit

Swings – lightweight version of AWT

Event – Java Classes(in java.awt.event package)

Event Class	Description
ActionEvent	Generated when a button is pressed, a list item is double-clicked, or a menu item is selected.
AdjustmentEvent	Generated when a scroll bar is manipulated.
ComponentEvent	Generated when a component is hidden, moved, resized, or becomes visible.
ContainerEvent	Generated when a component is added to or removed from a container.
FocusEvent	Generated when a component gains or loses keyboard focus.
InputEvent	Abstract superclass for all component input event classes.
ItemEvent	Generated when a check box or list item is clicked; also occurs when a choice selection is made or a checkable menu item is selected or deselected.
KeyEvent	Generated when input is received from the keyboard.
MouseEvent	Generated when the mouse is dragged, moved, clicked, pressed, or released; also generated when the mouse enters or exits a component.
MouseWheelEvent	Generated when the mouse wheel is moved.
TextEvent	Generated when the value of a text area or text field is changed.
WindowEvent	Generated when a window is activated, closed, deactivated, deiconified, iconified, opened, or quit.

Event Source – GUI Components – Java Classes (in java.awt package)

Event Source	Description
Button	Generates action events when the button is pressed.
Check box	Generates item events when the check box is selected or deselected.
Choice	Generates item events when the choice is changed.
List	Generates action events when an item is double-clicked; generates item events when an item is selected or deselected.
Menu Item	Generates action events when a menu item is selected; generates item events when a checkable menu item is selected or deselected.
Scroll bar	Generates adjustment events when the scroll bar is manipulated.
Text components	Generates text events when the user enters a character.
Window	Generates window events when a window is activated, closed, deactivated, deiconified, iconified, opened, or quit.

NOTE:- For swings, use J version of the above classes from javax.swing package. Eg:- Instead of Button, JButton

Event Listeners (Java Interfaces) – java.awt.event package

Interface	Event class	No.of methods in the interface	Method name
ActionListener	ActionEvent	1	actionPerformed
AdjustmentListener	AdjustmentEvent	1	adjustmentValueChanged
ComponentListener	ComponentEvent	4	componentResized componentMoved componentShown componentHidden
ContainerListener	ContainerEvent	2	componentAdded componentRemoved
FocusListener	FocusEvent	2	focusGained focusLost
ItemListener	ItemEvent	1	itemStateChanged
KeyListener	KeyEvent	3	keyPressed keyReleased keyTyped
MouseListener	MouseEvent	5	mouseClicked mouseEntered mouseExited mousePressed mouseReleased
MouseMotionListener	MouseEvent	2	mouseDragged mouseMoved
MouseWheelListener	MouseWheelEvent	1	mouseWheelMoved
TextListener	TextEvent	1	textChanged
WindowFocusListener	WindowEvent	2	windowGainedFocus windowLostFocus
WindowListener	WindowEvent	7	windowActivated windowClosed windowClosing windowDeactivated windowDeiconified windowIconified windowOpened

NOTE:- All methods in the above table have return type as void and one parameter as the respective event class

For eg:- void adjustmentValueChanged (AdjustmentEvent e)