

EVENT HANDLING



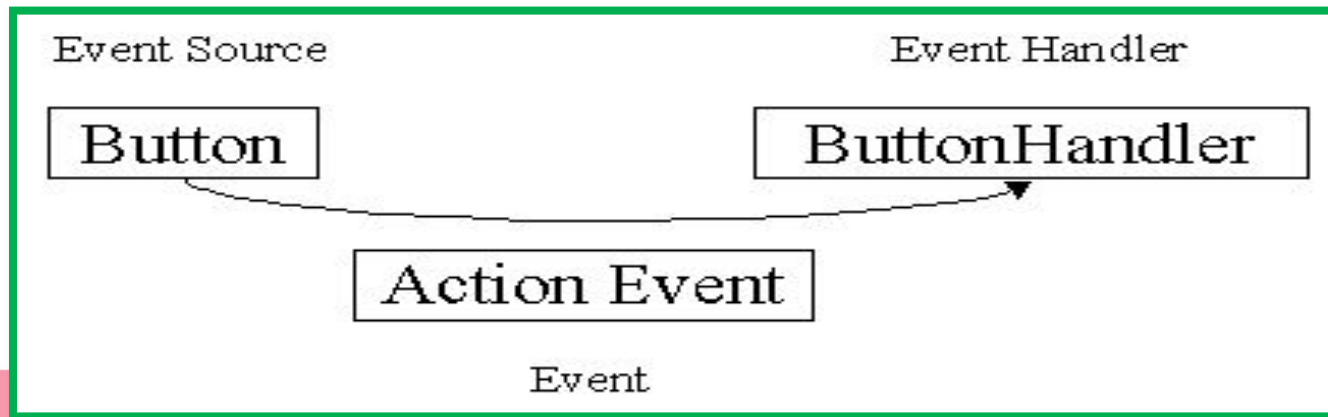
What is Event?

- GUI components like button, List, Checkbox etc. communicate with the rest of the applications through events.
- The source of an event is the component that causes that event to occur.
- The listener of an event is an object that receives the event and processes it appropriately.



Event Delegation Model

- **Event**
 - Actions like clicking button with a mouse, pushing down a key on keyboard
- **Event Source**
 - Sources that cause events such as a button, a key
- **Event Handler**
 - Methods that get an occurred event, then handle proper actions



Event classes

EventObjcet	FocusEvent
AWTEvent	ItemEvent
ActionEvent	KeyEvent
AdjustmentEvent	MouseEvent
ComponentEvent	MouseWheelEvent
ContainerEvent	TextEvent
WindowEvent	



AWTEvent class

- Subclass of EventObjcet class and member of **java.awt** package
- Super class of all AWT events handled by event delegation model
- Methods:
 - int getID(): returns type of event in integer, for ex 1001 for button
 - String toString()



Event Class	Description	Listener Interface
ActionEvent	generated when button is pressed, menu-item is selected, list-item is double clicked	ActionListener
MouseEvent	generated when mouse is dragged, moved, clicked, pressed or released also when the enters or exit a component	MouseListener
KeyEvent	generated when input is received from keyboard	KeyListener
ItemEvent	generated when check-box or list item is clicked	ItemListener
TextEvent	generated when value of textarea or textfield is changed	TextListener

Event	Description	Listener
WindowEvent	generated when window is activated, deactivated, deiconified, iconified, opened or closed	WindowListener
ComponentEvent	generated when component is hidden, moved, resized or set visible	ComponentEventListener
ContainerEvent	generated when component is added or removed from container	ContainerListener
AdjustmentEvent	generated when scroll bar is manipulated	AdjustmentListener
FocusEvent	generated when component gains or loses keyboard focus	FocusListener

ActionEvent & ActionListener

- Action event is probably the easiest and most common event handlers to implement.
- Constructors of ActionEvent:
 - ActionEvent(Object Source, int type, String command)
 - ActionEvent(Object Source, int type, String command, int modifiers)
- Methods of ActionEvent: [Example](#)
 - String getActionCommand()
 - int getModifiers()
- Method of ActionListener
 - void actionPerformed(ActionEvent obj)



ItemEvent & ItemListener

- Generated when a checkbox or list item is clicked
- Constructor:
 - `ItemEvent(Item source, int type, int state)`
- Constants:
 - `SELECTED`
 - `DESELECTED`
 - `ITEM_STATE_CHANGED`
- This class implements method:
 - `void itemStateChanged(ItemEvent obj)`

[Example](#)



MouseEvent & MouseListener

- Constants:
 - MOUSE_CLICKED
 - MOUSE_PRESSED
 - MOUSE_RELEASED
 - MOUSE_DRAGGED
 - MOUSE_ENTERED
 - MOUSE_EXITED
 - MOUSE_MOVED
- Methods:
 - getX(), getY(), getClickCount()

Example



MouseListener & MouseMotionListener

- **Methods of MouseListener**

- void mouseClicked(MouseEvent obj)
- void mousePressed(MouseEvent obj)
- void mouseReleased(MouseEvent obj)
- void mouseEntered(MouseEvent obj)
- void mouseExited(MouseEvent obj)

- **Methods of MouseMotionListener**

- void mouseMoved(MouseEvent obj)
- void mouseDragged(MouseEvent obj)



KeyEvent & KeyListener

- Event is generated when key is pressed of the keyboard
- Constant:
 - KEY_PRESSED
 - KEY_RELEASED
 - KEY_TYPED

Example

- Methods of KeyListener:
 - void keyPressed(KeyEvent obj)
 - void keyReleased(KeyEvent obj)
 - void keyTyped(KeyEvent obj)



FocusEvent & FocusListener

- Generated component gets or lost focus.
- Constants:
 - FOCUS_GAINED
 - FOCUS_LOST
- Listener methods:
 - void focusGained(FocusEvent e)
 - void focusLost(FocusEvent e)

Example



TextEvent & TextListener

- Generated when user inputs text into TextField or TextArea
- Constants:
 - TEXT_VALUE_CHANGED
- Listener method:
 - void textValueChanged(TextEvent e)

Example



WindowEvent & WindowListener

- Handles events related to window

- Constants:

- WINDOW_ACTIVATED
- WINDOW_DEACTIVATED
- WINDOW_CLOSING
- WINDOW_CLOSED
- WINDOW_OPENED
- WINDOW_GAINED_FOCUS
- WINDOW_LOST_FOCUS
- WINDOW_ICONIFIED (Minimize)
- WINDOW_DEICONIFIED
- WINDOW_STATE_CHANGED

Example

- **Methods of listener is according to above constants**



