Event Handling
part 2

Important Points Revisited

Important Points Revisited

- To handle a particular kind of event, we have to implement a corresponding interface
- For example
  - Button generates action event, we have to implement ActionListener interface to handle action events
  - Window generates window event, we have to implement WindowListener interface to handle window evetns

Important Points Revisited

- Event Handling Steps
  - Step 1
    - Create components which can generate events
  - Step 2
    - Build component (objects) that can handle events (Event Handlers)
  - Step 3
    - Register handlers with generators

More Examples

Handling Mouse Events

Handling Mouse Events

- Mouse events can be trapped for any GUI component that inherit from `Component` class. For example, JPanel, JFrame & JButton etc.

- To handle Mouse events, two types of listener interfaces are available
  - MouseMotionListener
  - MouseListener

Handling Mouse Events

- MouseMotionListener
  - For processing mouse motion events
  - Mouse motion event is generated when mouse is moved or dragged

```
public interface MouseMotionListener {

   public void mouseDragged (MouseEvent me);

   public void mouseMoved (MouseEvent me);

}
```

Handling Mouse Events

- MouseListener
  - For processing “interesting” mouse events
  - Mouse event is generated when mouse is
    - Pressed
    - Released
    - clicked (pressed & released without moving the cursor)
    - Enter (mouse cursor enters the bounds of component)
    - Exit (mouse cursor leaves the bounds of component)

Handling Mouse Events
Interface MouseListener

```
public interface MouseListener {

   public void mousePressed (MouseEvent me);

   public void mouseClicked (MouseEvent me);

   public void mouseReleased (MouseEvent me);

   public void mouseEntered (MouseEvent me);

   public void mouseExited (MouseEvent me);

}
```

Example Code
Handling Mouse Motion Events

Steps for Handling Mouse Motion Events

1. ? Create mouse motion events generating components
   - JFrame myFrame = new JFrame();

2. ? Create Event Handler
   - Implement MouseMotionListener Interface
   - Provide implementaion for the required method

```
public void mouseMoved (MouseEvent e) {
    // write your code here
}
```

   - provide empty bodies for remaining methods in the interface.

Steps for Handling Mouse Motion Events

3. Register event generator with event handler

```
myFrame.addMouseMotionListener (this);
```

Object of the Event Hanlder class

Example Code (cont.)
Handling Mouse Motion Events

```
// File EventsEx.java, Code listed in Handout section 12.1

…… // import required packages

public class EventsEx implements MouseMotionListener {

   JFrame f;
   JLabel   coord;

  public void initGUI ( ){

      …..   // set layout
      …..  // add label to container

      // registration
      f.addMouseMotionListener(this)
      …..
 }  // end of initGui
```

Example Code (cont.)
Handling Mouse Motion Events

```
// MouseMotionListener event handlers
public void mouseDragged (MouseEvent me) {
    int x = me.getX();
    int y = me.getY();
    coord.setText("Dragged at [" + x + "," + y + "]” );
}

public void mouseMoved (MouseEvent me) {
    int x = me.getX();
    int y = me.getY();
    coord.setText(“Moved at [" + x + "," + y + "]” );
}
```

Example Code (cont.)
Handling Mouse Motion Events

```
  public static void main (String args[ ]){
        EventsEx ex = new EventsEx();
   }
} // end of EventsEx class
```

Handling Mouse Motion Events

Live Output

Another Example
Handling Window Events

Handling Window Events

- Want to handle Window Exit event only
  - Why ?
    - When window is closed, control should return back to command prompt
    - But we have already achieved this functionality through following line of code

```
frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
```

    - But, what if we want to display some message (Good Bye) before exiting

Handling Window Events

- How ?
  - To handle window events, we need to implement “WindowListner” interface.
  - “WindowListner” interface contains 7 methods
  - We require only one i.e. windowClosing
  - We have to provide definitions of all methods to make concrete class

Interface WindowListener

```
public interface WindowListener {

  public void windowActivated (WindowEvent we);

  public void windowClosed (WindowEvent we);

  public void windowClosing (WindowEvent we);

  public void windowDeactivated (WindowEvent we);

  public void windowDeiconified (WindowEvent we);

  public void windowIconified (WindowEvent we);

  public void windowOpened (WindowEvent we);

}
```

Example Code: Window Exit Handler

Modification of EventsTest.java

```
// File EventsEx.java, Code listed in Handout section 12.2
……..
public class EventsEx implements MouseMotionListener , WindowListener, {
    JFrame f;
    JLabel coord;

    public void initGUI () {
        …….  // set layouts

        window.addMouseMotionListener(this);

        f.addWindowListener(this);
       …….
    }//end initGUI

   // Event Handlers for MouseMotionListener
   public void mouseDragged(MouseEvent me) {…..}

   public void mouseMoved(MouseEvent) {….}
```

Example Code: Window Exit Handler

Modification of EventsTest.java

```
// Event Handlers for WindowListener
   public void windowActivated (WindowEvent we) {    }

   public void windowClosed (WindowEvent we) {  }

   public void windowClosing (WindowEvent we) {
      JOptionPane.showMessageDialog(null, “Good Bye”);
      System.exit(0)
   }

   public void windowDeactivated (WindowEvent we) {   }

   public void windowDeiconified (WindowEvent we) {   }

   public void windowIconified (WindowEvent we) {   }

   public void windowOpened (WindowEvent we) {   }
```

Example Code: Window Exit Handler

Modification of EventsTest.java

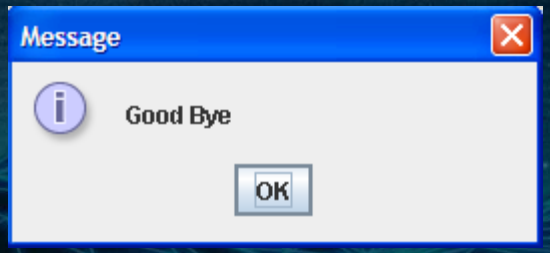
```
  public static void main (String args[ ]){
        EventsEx ex = new EventsEx();
   }
} // end of EventsEx class
```

Example Code: Window Exit Handler

Modification of EventsTest.java

Output

When user closes the window,
Message would be displayed



After pressing Ok button
Program will exit