GUI Programming: Events

Slides derived from the work of
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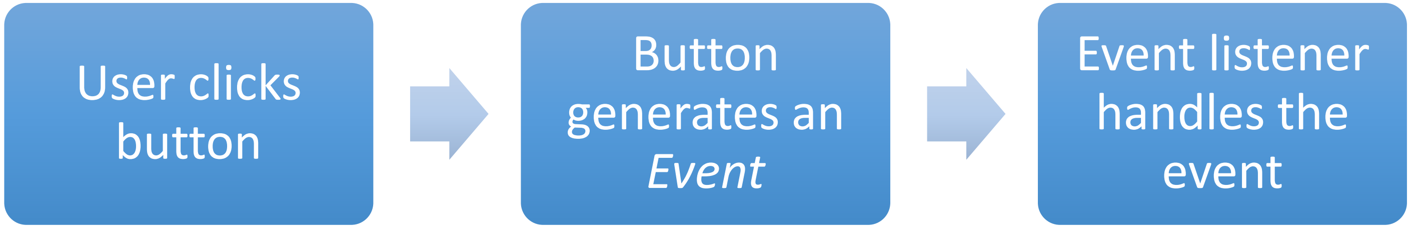
How do we make our GUIs DO something?

- What does it mean to click a button?
- How do you know when the user clicks somewhere?
- How do you grab text that a user types?
- What does clicking a button, a radio check box, entering text, and moving your mouse all have in common?
  - EVENTS!

What does it mean to click a button?

User clicks button

What does it mean to click a button?



User clicks button

Button generates an *Event*

Event listener handles the event

ActionListener Interface

- Your event listener must provide an implementation that handles the event
- This event listener is registered using component.addActionListener(listener)

-> Java API: Examine ActionListener

Examples

- First: Make our two button interface print out different text when we click on the two buttons
- Second: Make the buttons change the color inside the window somehow

Example

Hello my name is __________

OK

Have it print out “Hello NAME” where name is what you enter

More event driven programming

Inner Classes

- Inner class is defined inside another class
- Can access variables in outer class
- Can be very useful in handling events

Anonymous Inner Classes

```
button.addActionListener(new ActionListener() {
   @Override
      public void actionPerformed(ActionEvent e) {
           doSomething();
      }
   }
```

- Implicitly defines a new class that extends ActionListener
- We do not give it a class name
- Created inline

Example

- Convert button example to use inner classes
- Convert our button printout example to use anonymous inner classes

Other Things Listeners Can Do

Ask for the source:

- ActionEvent.getSource
  - See API

Example

Rewrite button example to only have one listener for all buttons

- Use an inner class

Types of Events

- JEvent:
  - Jbutton, JTextField, JComboBox, JRadioButton, JCheckBox, …
- Mouse events:
  - mouse button being pressed
  - mouse moving
- Keyboard presses

Mouse Events

- Examine MouseEvent API
  - Look at InputEvent (parent of MouseEvent) also
- Often use Listener Interface Adapters
  - Saves you from having to implement every event
  - Default implementation is empty
  - -> Examine MouseAdaptor API

Example

- Adapt the ☺ example to follow the mouse
  - Dragged or movement?
- Advanced example:
  - Give ☺ eyes that track the mouse
  - Won’t do this in class but it is good work for you to ensure you understand graphics and events!

Keyboard Events

- Examine KeyListener API
- Can use to make games!
- Example in lab

Animation: another option

- Examine the Timer class API
  - Javax.swing.Timer
- Can be used to implement a regular timer

Example

- Adapt the bouncing smiley demo to use a timer