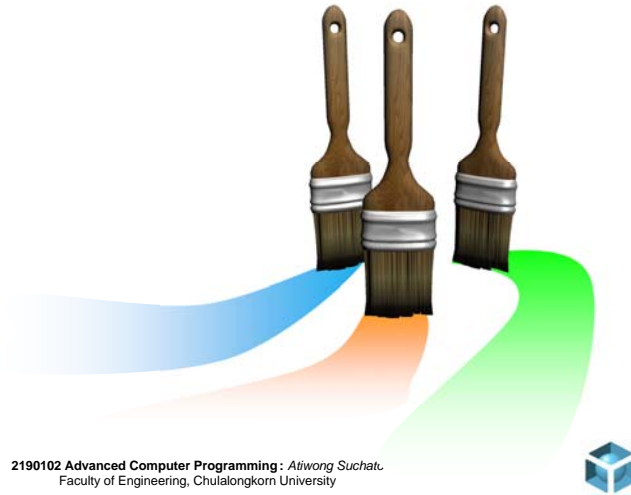


## Custom Painting of *JComponent*

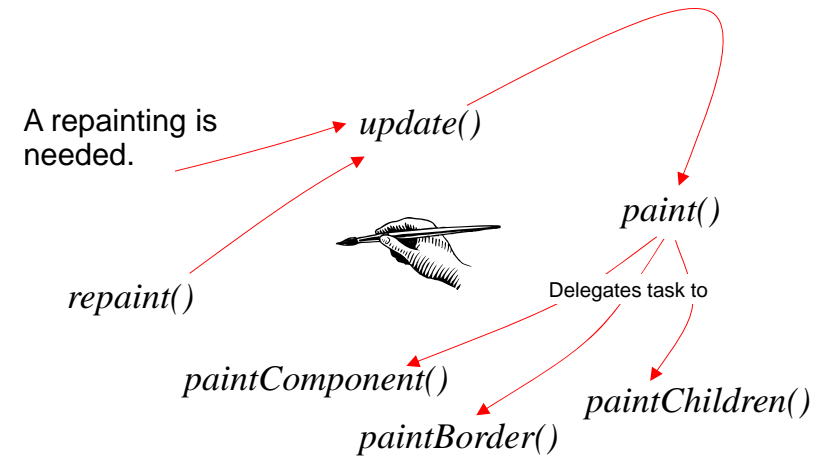


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## Painting of *JComponent*

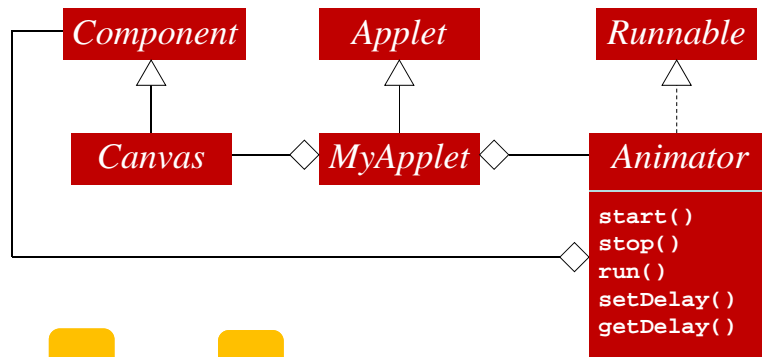


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## Animator Delegation



CircularMotionApplet.java



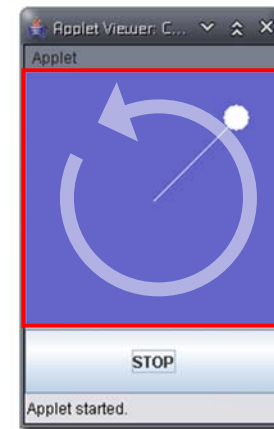
Animator.java

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## Example



*MyDrawing extends JPanel*



*Animator implements Runnable*

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## Menus and Dialogs

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## Menus

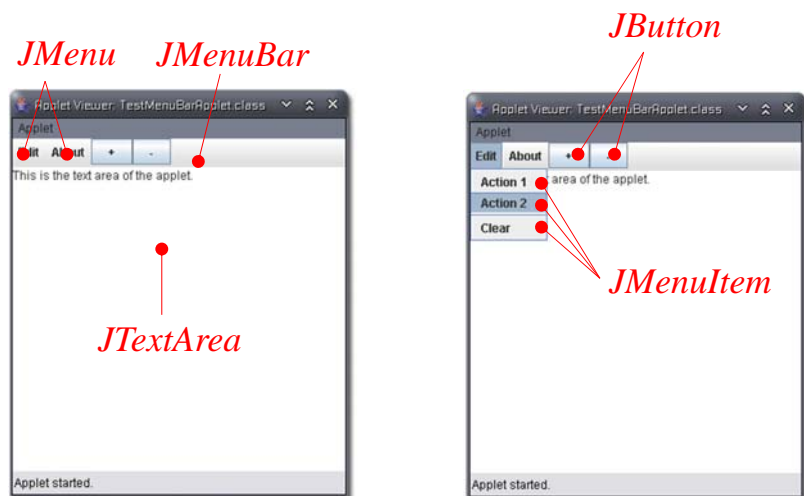
- Menus are not placed with the other components in the UI but usually along the top of a window
- A menu bar contains one or more menus.
- Swing classes related to menus include (but not limited to) *JMenuBar*, *JMenu*, *JMenuItem*

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## Menus

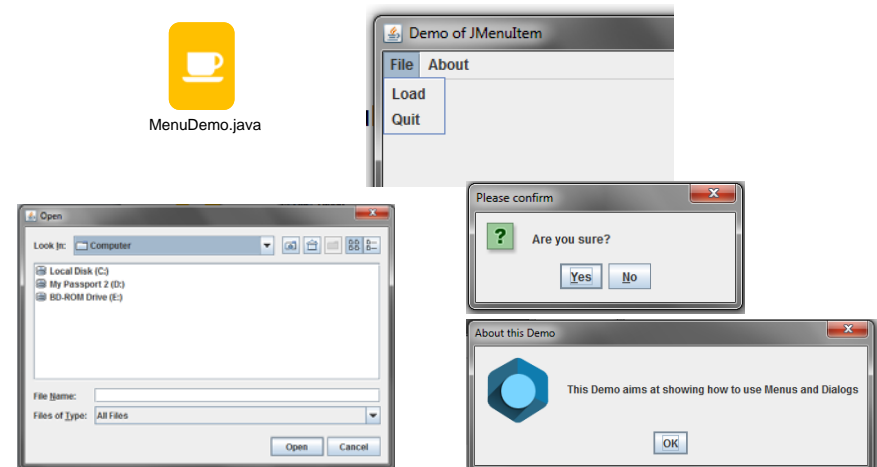


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## Menus & Dialogs Example



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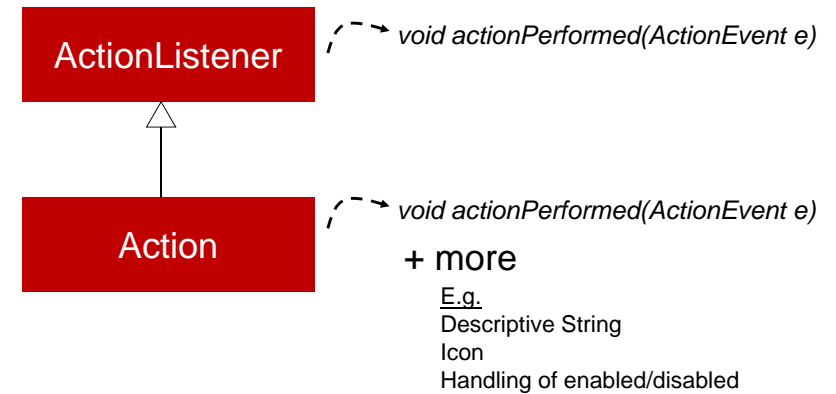
## Actions & Key Bindings

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## Action vs. ActionListener

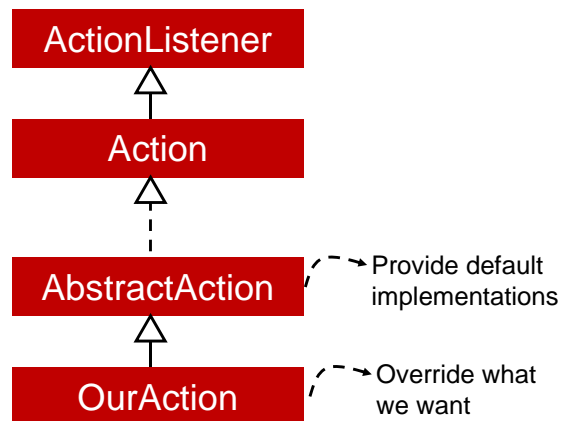


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## Interface & Abstract Classes



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## Action Example in Menus

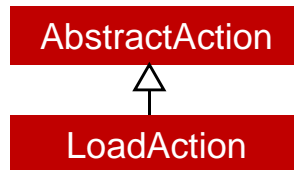
```
JMenuItem itemLoad = new JMenuItem("Load");
itemLoad.setAccelerator(KeyStroke.getKeyStroke(
    KeyEvent.VK_L, ActionEvent.CTRL_MASK));
itemLoad.addActionListener(
    new ActionListener() {
        public void actionPerformed(ActionEvent e) {
            JFileChooser chooser = new JFileChooser();
            int returnVal = chooser.showOpenDialog(MenuDemo.this);
            // This demo does nothing with returnVal
        }
    });
```

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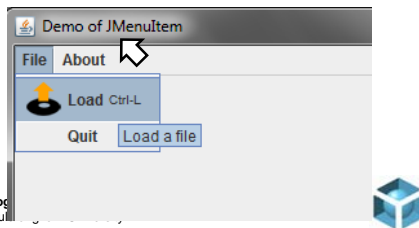
## Action Example in Menus



```
JMenuItem itemLoad = new JMenuItem( new LoadAction() );
```



MenuActionDemo.java

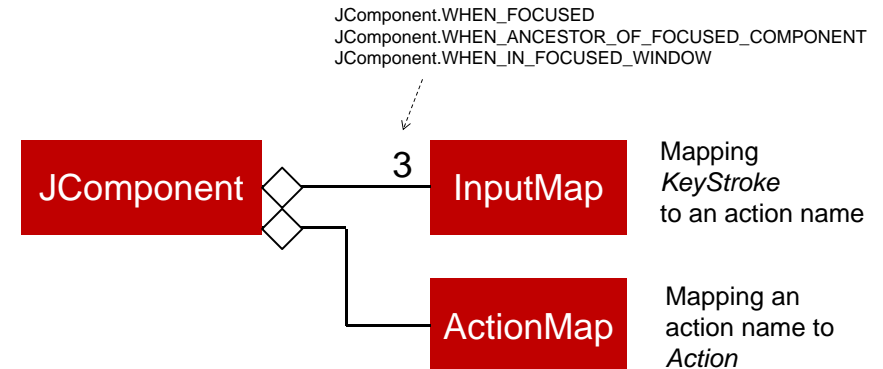


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## Key-Action Mapping



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## Key Binding Example



SpaceShipApp.java



StarField.java



Animator.java



Ship.java



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## Self-Study for Topic 4

### Lesson: Performing Custom Painting

<http://docs.oracle.com/javase/tutorial/uiswing/painting/index.html>

Read all pages.

### Lesson: Using Other Swing Features

<http://docs.oracle.com/javase/tutorial/uiswing/misc/index.html>

Read pages under

- "How to Use Actions"
- "How to Use Key Bindings"

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# Self-Study Test: Topic 4

The test must be done during:

**Saturday 6 September  
to Monday 8 September**

in the “Assessment” section of

my  
**CourseVille**

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