

# Swing

## Part 3: Menus

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Chapter 11, Core Java, Volume I

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# Menus

- Menu terminology:
  - **Menu bar** = Bar of top-level menus.
  - **Menu** = Rectangle with menu items and submenus.
  - **Menu item** = Selection resulting in an action.
- Add a menu bar to the frame:

```
JMenuBar menuBar = new JMenuBar();  
frame.setJMenuBar(menuBar);
```
- Add menus to the menu bar:

```
JMenu editMenu = new JMenu("Edit");  
menuBar.add(editMenu);
```
- Add menu items, separators and submenus to the menu:

```
JMenuItem pasteItem = new JMenuItem("Paste");  
editMenu.add(pasteItem);  
editMenu.addSeparator();  
JMenu optionsMenu = ...; // a submenu  
editMenu.add(optionsMenu);
```



# Menu Item Actions

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- When the user selects a menu item, an action event occurs:  
    `pasteItem.addActionListener(event -> ...);`
- Use **Action objects** to describe actions that can be triggered by menus, toolbar buttons and keystrokes:

```
Action exitAction = new AbstractAction("Exit") // menu item text goes here
{
    public void actionPerformed(ActionEvent event)
    {
        System.exit(0);
    }
};
```

```
JMenuItem exitItem = new JMenuItem(exitAction);
fileMenu.add(exitItem);
==
JMenuItem exitItem = fileMenu.add(exitAction);
```

# Special Menu Items

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- Add [icon](#) to menu item:  
`JMenuItem cutItem = new JMenuItem("Cut", new ImageIcon("cut.gif"));`
- Or better, add the icon to the [Action](#).  
`cutAction.putValue(Action.SMALL_ICON, new ImageIcon("cut.gif"));`
- [Check box](#) in menu item:  
`JCheckBoxMenuItem readonlyItem = new JCheckBoxMenuItem("Read-only");`
- [Radio buttons](#) in menu items:  
`ButtonGroup group = new ButtonGroup();`  
`JRadioButtonMenuItem insertItem = new JRadioButtonMenuItem("Insert");`  
`insertItem.setSelected(true);`  
`JRadioButtonMenuItem overtypeItem = new JRadioButtonMenuItem("Overtyping");`  
`group.add(insertItem);`  
`group.add(overtypingItem);`  
`optionsMenu.add(insertItem);`  
`optionsMenu.add(overtypingItem);`

# Pop-Up Menus

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- Create a menu with items as usual, but this time with a `JPopupMenu` on the top level:  

```
JPopupMenu popup = new JPopupMenu();  
JMenuItem item = new JMenuItem("Cut");  
popup.add(item);  
...
```
- Pop up the menu when [the right mouse button](#) is clicked on a component:  

```
component.setComponentPopupMenu(popup);
```



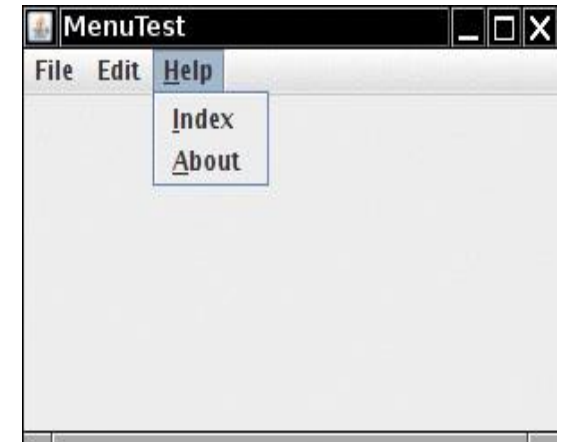
# Keyboard Mnemonics and Accelerators

- Mnemonic = Underlined character in menu items:  

```
var aboutMenu = new JMenuItem("About", KeyEvent.VK_A);  
or  
aboutMenu.setMnemonic(KeyEvent.VK_A);  
or  
aboutAction.putValue(Action.MNEMONIC_KEY,  
                        new Integer(KeyEvent.VK_A));
```
- Use the `setMnemonic` method in menus:  

```
JMenu helpMenu = new JMenu("Help");  
helpMenu.setMnemonic(KeyEvent.VK_H);
```
- Accelerator key = Key that directly selects the action:  

```
openItem.setAccelerator(KeyStroke.getKeyStroke("ctrl O"));
```



# Enabling and Disabling Menu Items

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- Can temporarily disable a menu item:  
`saveItem.setEnabled(false);`
- Disabled items are grayed out:





## Example: Menu (Listing 11.6)

```
import java.awt.event.*;
import javax.swing.*;

/**
 * A frame with a sample menu bar.
 */
public class MenuFrame extends JFrame
{
    private static final int DEFAULT_WIDTH = 300;
    private static final int DEFAULT_HEIGHT = 200;
    private Action saveAction;
    private Action saveAsAction;
    private JCheckBoxMenuItem readonlyItem;
    private JPopupMenu popup;
```



## Example: Menu (Listing 11.6)

---

```
/**
 * A sample action that prints the action name to System.out
 */
class TestAction extends AbstractAction
{
    public TestAction(String name)
    {
        super(name);
    }

    public void actionPerformed(ActionEvent event)
    {
        System.out.println(getValue(Action.NAME) + " selected.");
    }
}
```

## Example: Menu (Listing 11.6)

```
public MenuFrame()
{
    setSize(DEFAULT_WIDTH, DEFAULT_HEIGHT);

    JMenu fileMenu = new JMenu("File");
    fileMenu.add(new TestAction("New"));

    // demonstrate accelerators

    JMenuItem openItem = fileMenu.add(new TestAction("Open"));
    openItem.setAccelerator(KeyStroke.getKeyStroke("ctrl O"));

    fileMenu.addSeparator();

    saveAction = new TestAction("Save");
    JMenuItem saveItem = fileMenu.add(saveAction);
    saveItem.setAccelerator(KeyStroke.getKeyStroke("ctrl S"));
```



## Example: Menu (Listing 11.6)

---

```
saveAsAction = new TestAction("Save As");
fileMenu.add(saveAsAction);
fileMenu.addSeparator();

fileMenu.add(new AbstractAction("Exit")
{
    public void actionPerformed(ActionEvent event)
    {
        System.exit(0);
    }
});
```

## Example: Menu (Listing 11.6)

// demonstrate checkbox and radio button menus

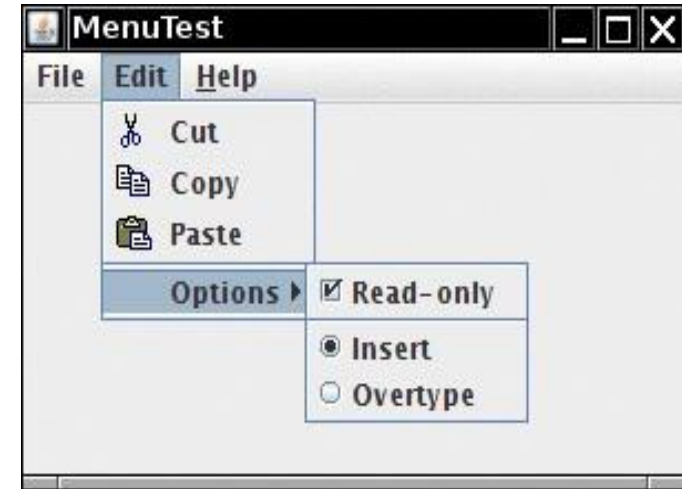
```
readonlyItem = new JCheckBoxMenuItem("Read-only");
readonlyItem.addActionListener(new ActionListener()
{
    public void actionPerformed(ActionEvent event)
    {
        boolean saveOk = !readonlyItem.isSelected();
        saveAction.setEnabled(saveOk);
        saveAsAction.setEnabled(saveOk);
    }
});
```

```
ButtonGroup group = new ButtonGroup();
```

```
JRadioButtonMenuItem insertItem = new JRadioButtonMenuItem("Insert");
```

```
insertItem.setSelected(true);
```

```
JRadioButtonMenuItem overtypeItem = new JRadioButtonMenuItem("Overtyping");
```



## Example: Menu (Listing 11.6)

---

```
group.add(insertItem);
group.add(overtypItem);

// demonstrate icons
Action cutAction = new TestAction("Cut");
cutAction.putValue(Action.SMALL_ICON, new ImageIcon("cut.gif"));
Action copyAction = new TestAction("Copy");
copyAction.putValue(Action.SMALL_ICON, new ImageIcon("copy.gif"));
Action pasteAction = new TestAction("Paste");
pasteAction.putValue(Action.SMALL_ICON, new ImageIcon("paste.gif"));

JMenu editMenu = new JMenu("Edit");
editMenu.add(cutAction);
editMenu.add(copyAction);
editMenu.add(pasteAction);
```

## Example: Menu (Listing 11.6)

// demonstrate nested menus

```
JMenu optionMenu = new JMenu("Options");
```

```
optionMenu.add(readonlyItem);
```

```
optionMenu.addSeparator();
```

```
optionMenu.add(insertItem);
```

```
optionMenu.add(overtypItem);
```

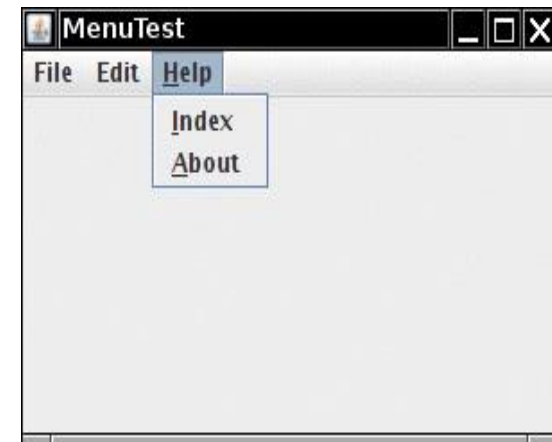
```
editMenu.addSeparator();
```

```
editMenu.add(optionMenu);
```

// demonstrate mnemonics

```
JMenu helpMenu = new JMenu("Help");
```

```
helpMenu.setMnemonic(KeyEvent.VK_H);
```



## Example: Menu (Listing 11.6)

---

// you can also add the mnemonic key to an action

```
Action aboutAction = new TestAction("About");  
aboutAction.putValue(Action.MNEMONIC_KEY, new Integer(KeyEvent.VK_A));  
helpMenu.add(aboutAction);
```

// add all top-level menus to menu bar

```
JMenuBar menuBar = new JMenuBar();  
setJMenuBar(menuBar);
```

```
menuBar.add(fileMenu);  
menuBar.add(editMenu);  
menuBar.add(helpMenu);
```



## Example: Menu (Listing 11.6)

---

// demonstrate pop-ups

```
popup = new JPopupMenu();
```

```
popup.add(cutAction);
```

```
popup.add(copyAction);
```

```
popup.add(pasteAction);
```

```
JPanel panel = new JPanel();
```

```
panel.setComponentPopupMenu(popup);
```

```
add(panel); // BorderLayout.CENTER
```

```
}
```

```
}
```