



# + GUI

## Graphical User Interface



# Gliederung

- AWT
- Swing
- SWT
- Open GL
- Direkt 3D

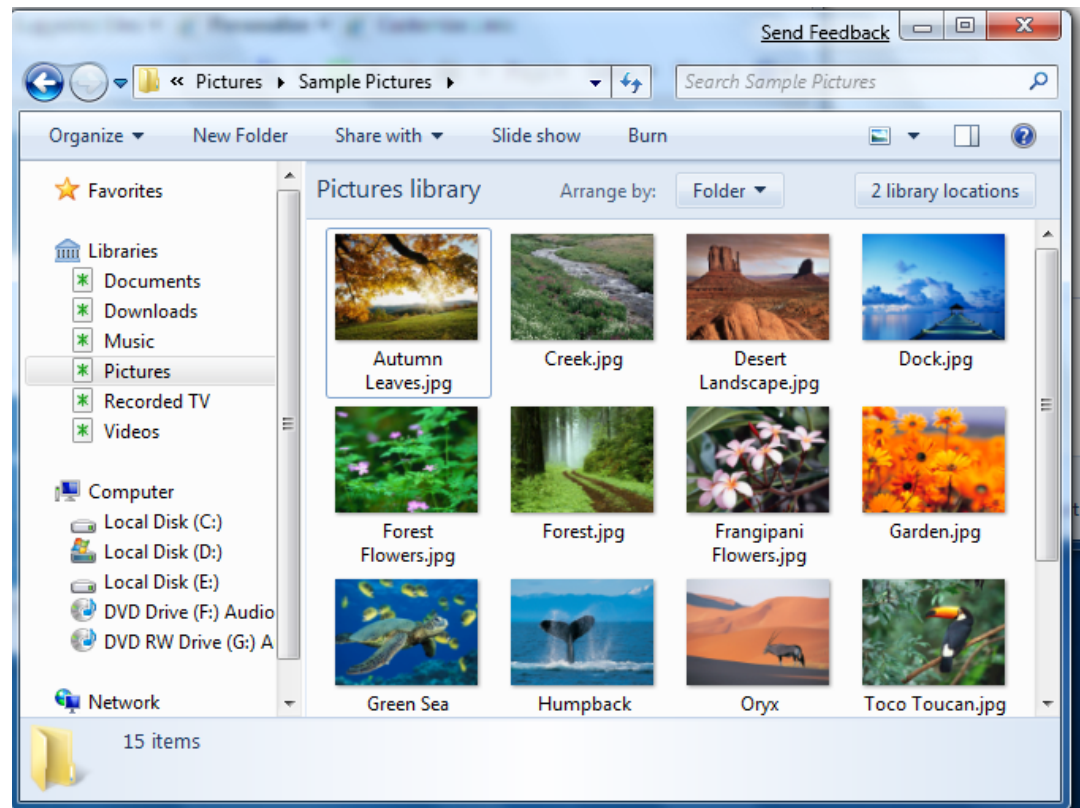


# Was ist GUI?

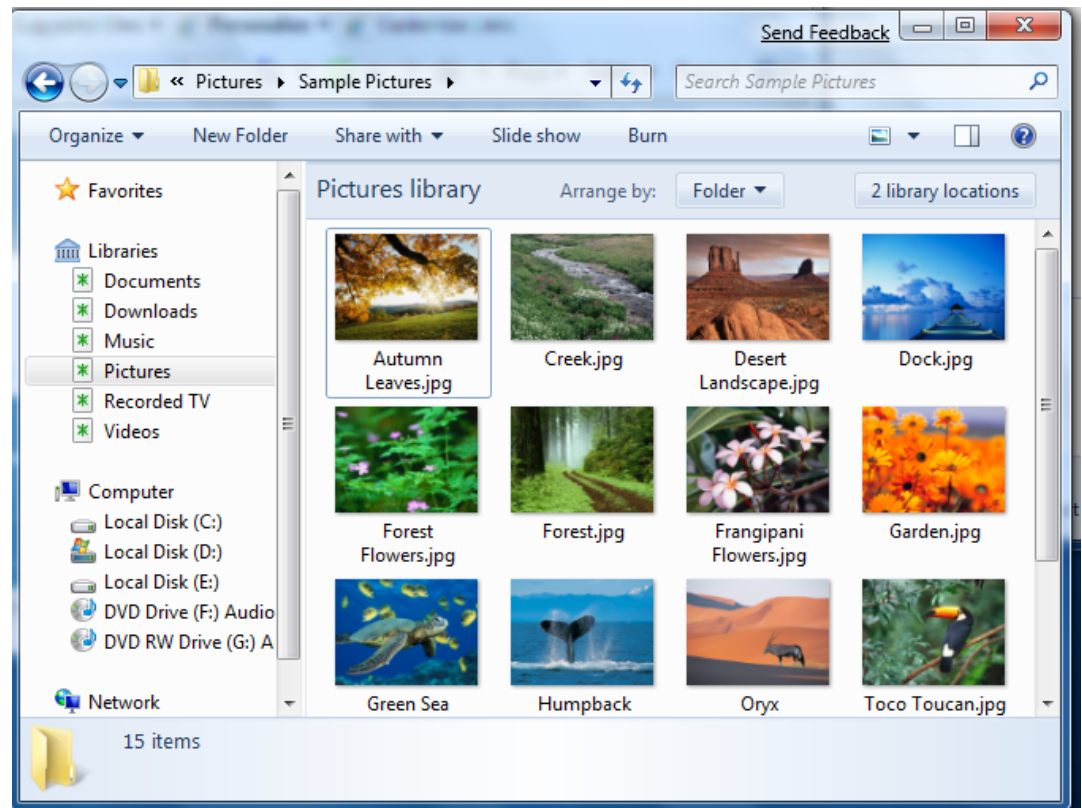
## ■ Software-Komponente

- Fenster
- Menü
- Taste(Button)
- etc.

## ■ Gesteuert Werden



# + GUI\_Container



# + Container\_Bei Spiel\_AWT

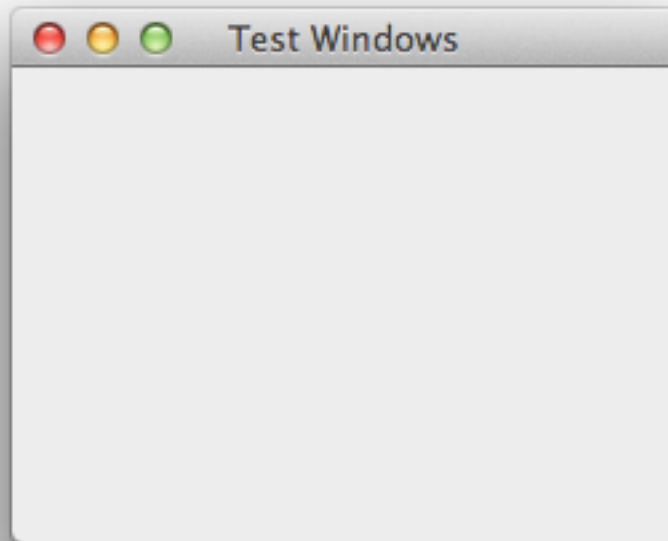
```
package caryJava;

import java.awt.*;;

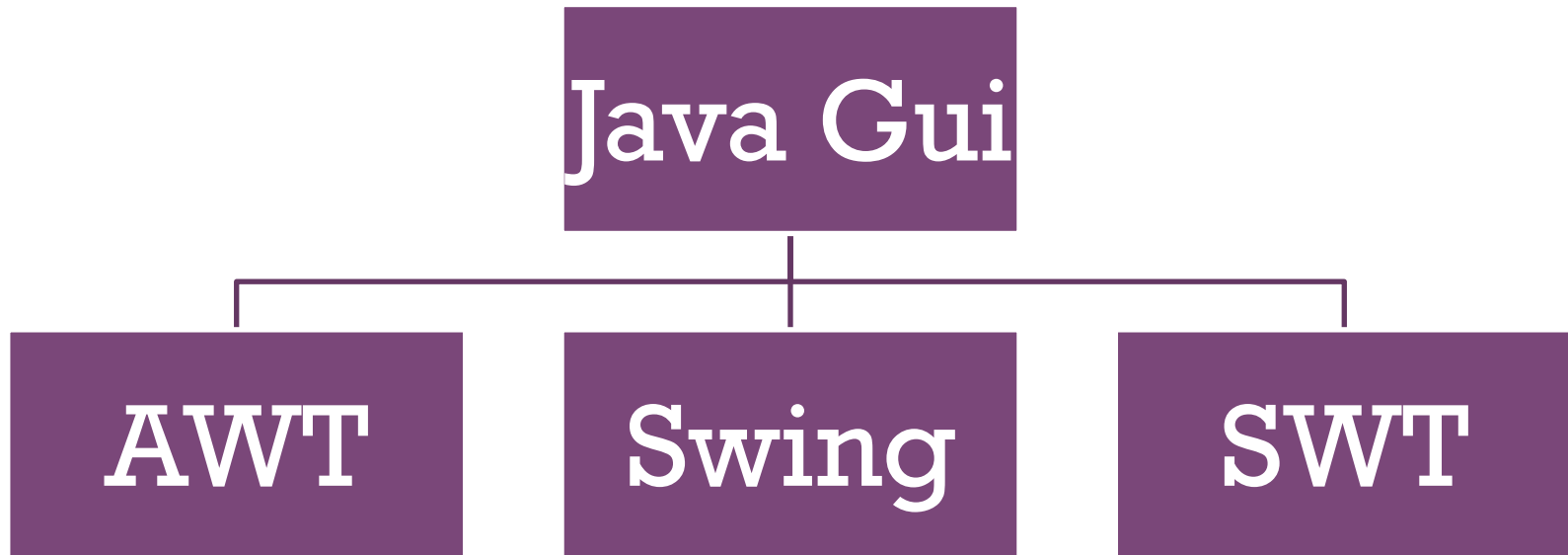
public class TestFrame {
    public static void main(String[] args){

        Frame f = new Frame("Test Windows");
        //set Fenster Size
        f.setBounds(30,30,250,200);
        f.setVisible(true);

    }
}
```



# + GUI in Java

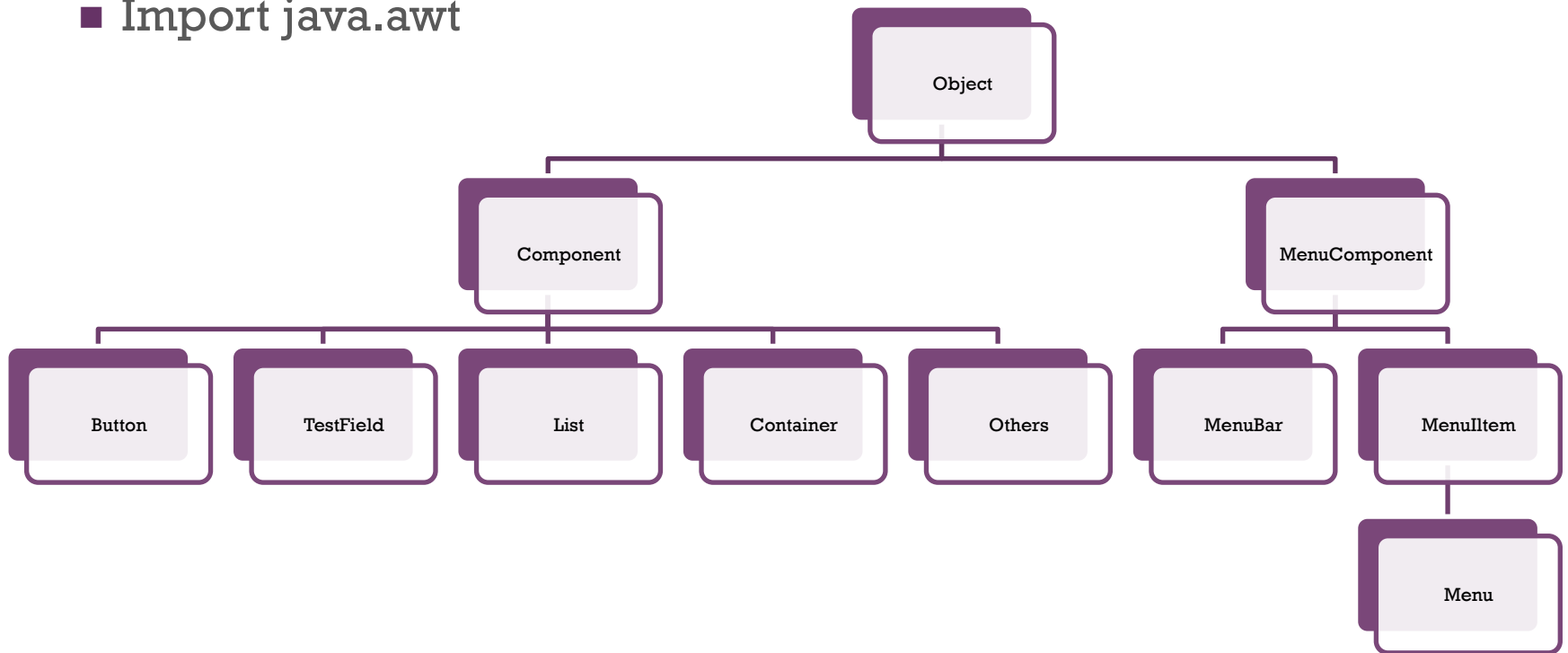


# + AWT

- Abstract Windows Toolkit
- „Write Once, Run Anzwhere“

# + AWT

## ■ Import java.awt

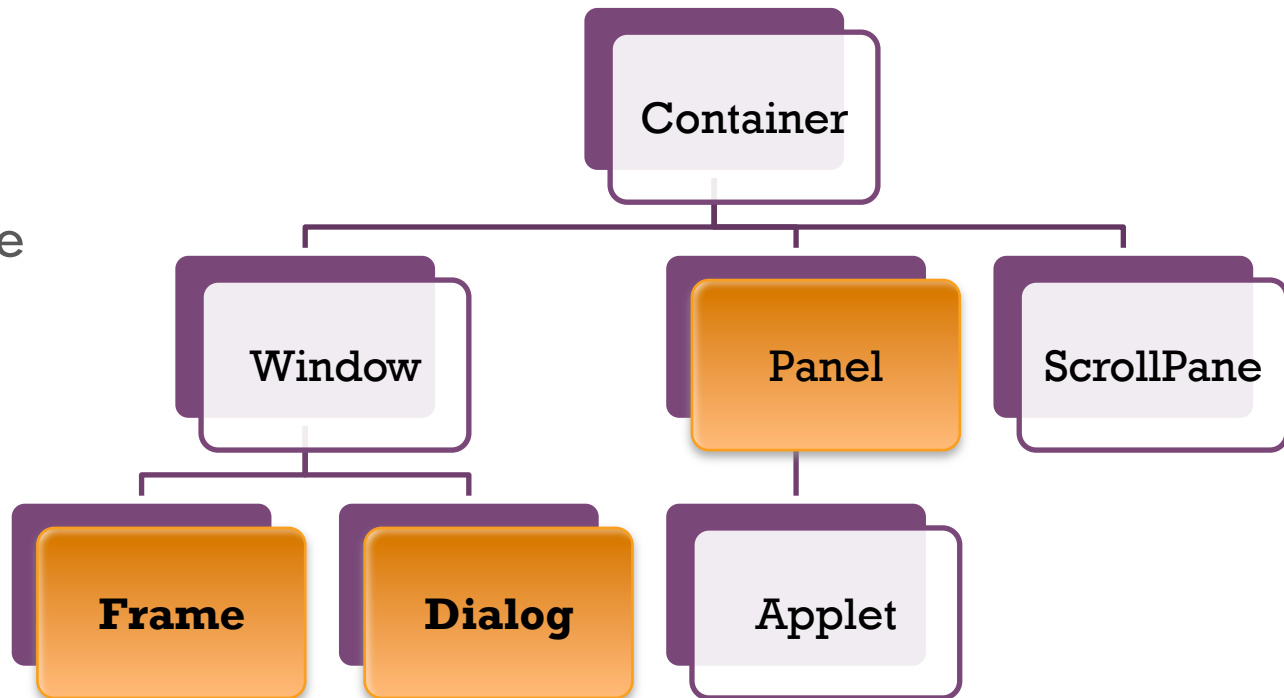






# AWT\_Container

- Window
- Panel
- ScrollPane

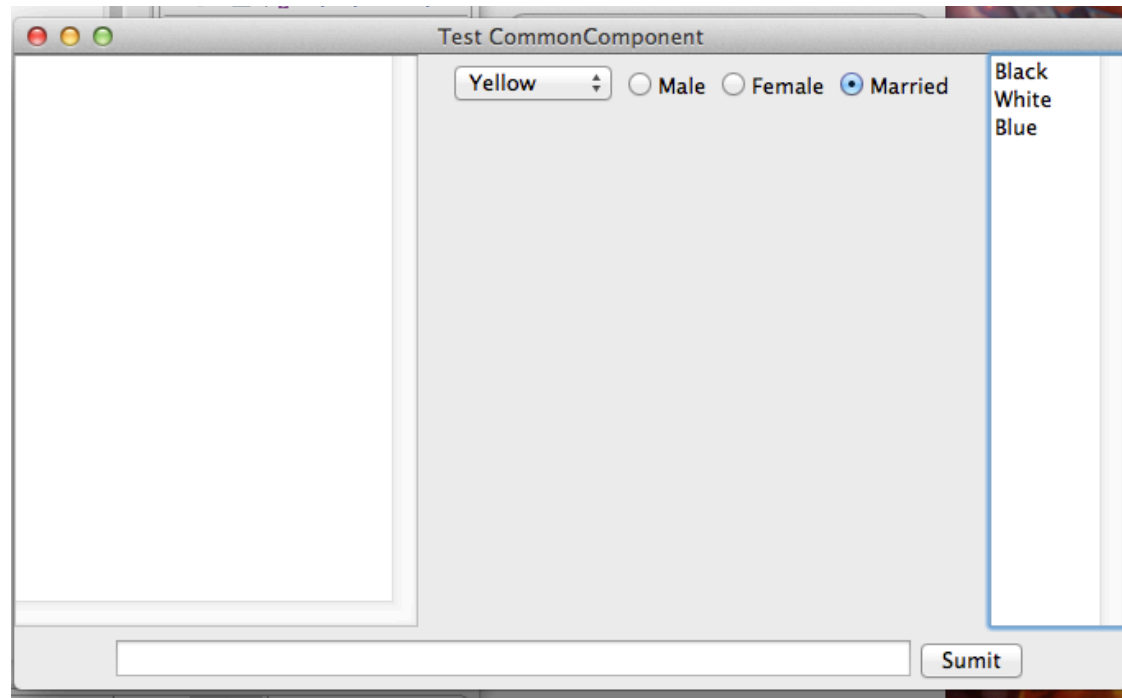




# AWT\_Komponente

## Common Component

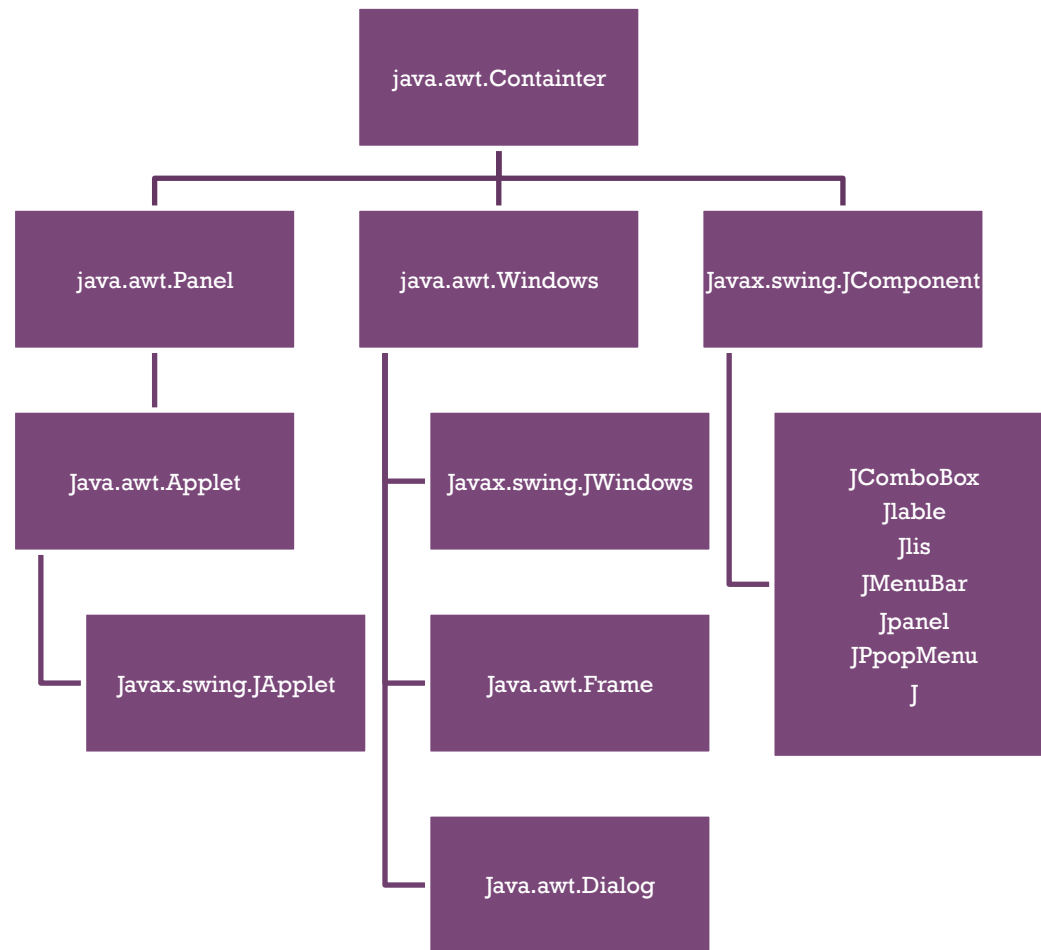
Button  
Canvas  
Checkbox  
CheckboxGroup  
Choice  
Frame  
• Label  
• List  
• Panel  
• Scrollbar  
• ScrollPane  
• TextArea  
• TextField



# + Swing

- 100% Java GUI
- Mehr Komponenten als AWT
- Gleiches Aussehen
- Metal Still(Ocean Themen)
- **MVC(mODEL- View - Controller) oder Model-Delegate**
- **PLAF : Pluggable Look And Feel**

# + Swing\_Komponente



# + Swing\_Vergleich mit AWT

- Komponent Hinweise: `setToolTipText()`
- Icon : `class ImageIcon`
- Still ist veränderbal : `JComponent—ComponentUI.  
UIManager.setLookAndFeel()`
- SET Border
- DoubleBuffered



# Swing\_PLAF

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ComponentUI

ButtonUI

BasicButtonUI

MotifButtonUI

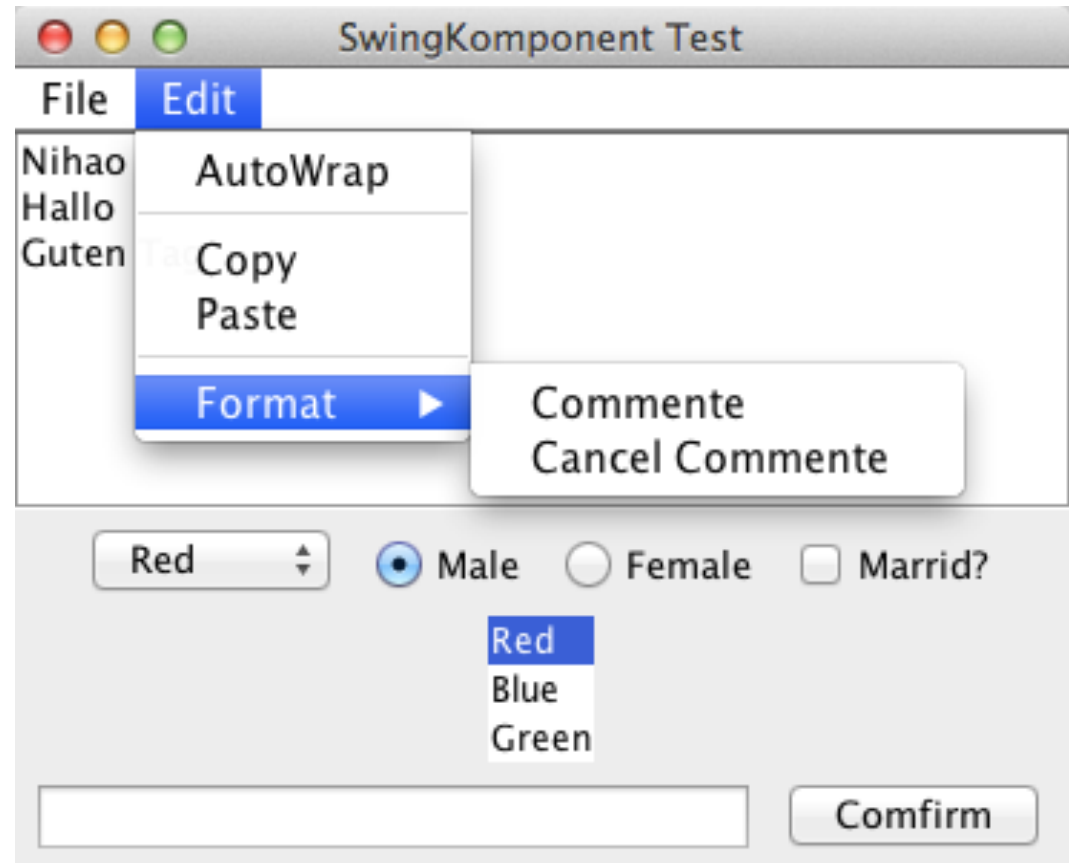
MetalButtonUI

WindowsButtonUI

MultiButtonUi

MenuItemUI

- JMenuBar
  - JMenu
    - JMenuItem
- JButton
- JComboBox
- JList
- JTextArea



# SWT

## The Standard Widget Toolkit

- Ein Open-Source für Java von Eclipse
- Nutzt die nativen graphischen Elemente des Betriebssystems
- JFace



**Browser**  
[javadoc - snippets](#)



**Button (SWT.ARROW)**  
[javadoc - snippets](#)



**Button (SWT.CHECK)**  
[javadoc - snippets](#)



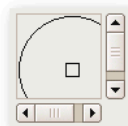
**Button (SWT.PUSH)**  
[javadoc - snippets](#)



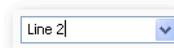
**Button (SWT.RADIO)**  
[javadoc - snippets](#)



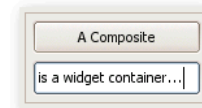
**Button (SWT.TOGGLE)**  
[javadoc - snippets](#)



**Canvas**  
[javadoc - snippets](#)



**Combo**  
[javadoc - snippets](#)



**Composite**  
[javadoc - snippets](#)



# + OpenGL

## Open Graphics Library

- Application programming interface
- 2D, 3D Graphics



# + Direct3D

- Programmierschnittstelle(API) von Microsoft
- 3D-Computergrafik
- DirectX



# + OpenGL v.s Direct3D

## Vorteile

- plattformunabhängig
- Selbst erweiterbar
- Client-Server-Modell
- Meist besser treiberunterstützung
- Draw Call-Kosten sind niedriger

## Nachteile

- Extensions-Chaos

# + Quelle

- Java ist auch ein Insel
- Wikipedia
- [eclipse.org](http://eclipse.org)



- `System.out.println('Danke');`