



Computer Programming

Graphical User Interface I

AWT: Abstract Window Toolkit

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Agenda

- ▶ Lecture Goal(s)
- ▶ Overview of AWT
- ▶ Containers
- ▶ Components
- ▶ Layout managers
- ▶ Events and Listeners
- ▶ Conclusion

Lecture Goal(s)



Lectures Overview

Java

- ▶ 8: Summarizing Example
- ▶ 9: Standard library
- ▶ 10: GUI – AWT
- ▶ 11: GUI – Swing
- ▶ 12: IO programming
- ▶ 13: Network programming
- ▶ 14: Java archives and JavaBeans
- ▶ 15: Conclusions

Today's Goal

To provide programming
knowledge about the
building of GUIs with
AWT (Abstract Window
Toolkit)

Overview of AWT



AWT

- ▶ Building GUIs
- ▶ Contains
 - ▶ Containers
 - ▶ Components
 - ▶ Layout Managers
 - ▶ Events and Listeners
- ▶ First GUI framework in Java (1996)
- ▶ Limited functionalities
- ▶ Quite ugly!!!

AWT Example



AWT Overview

Containers

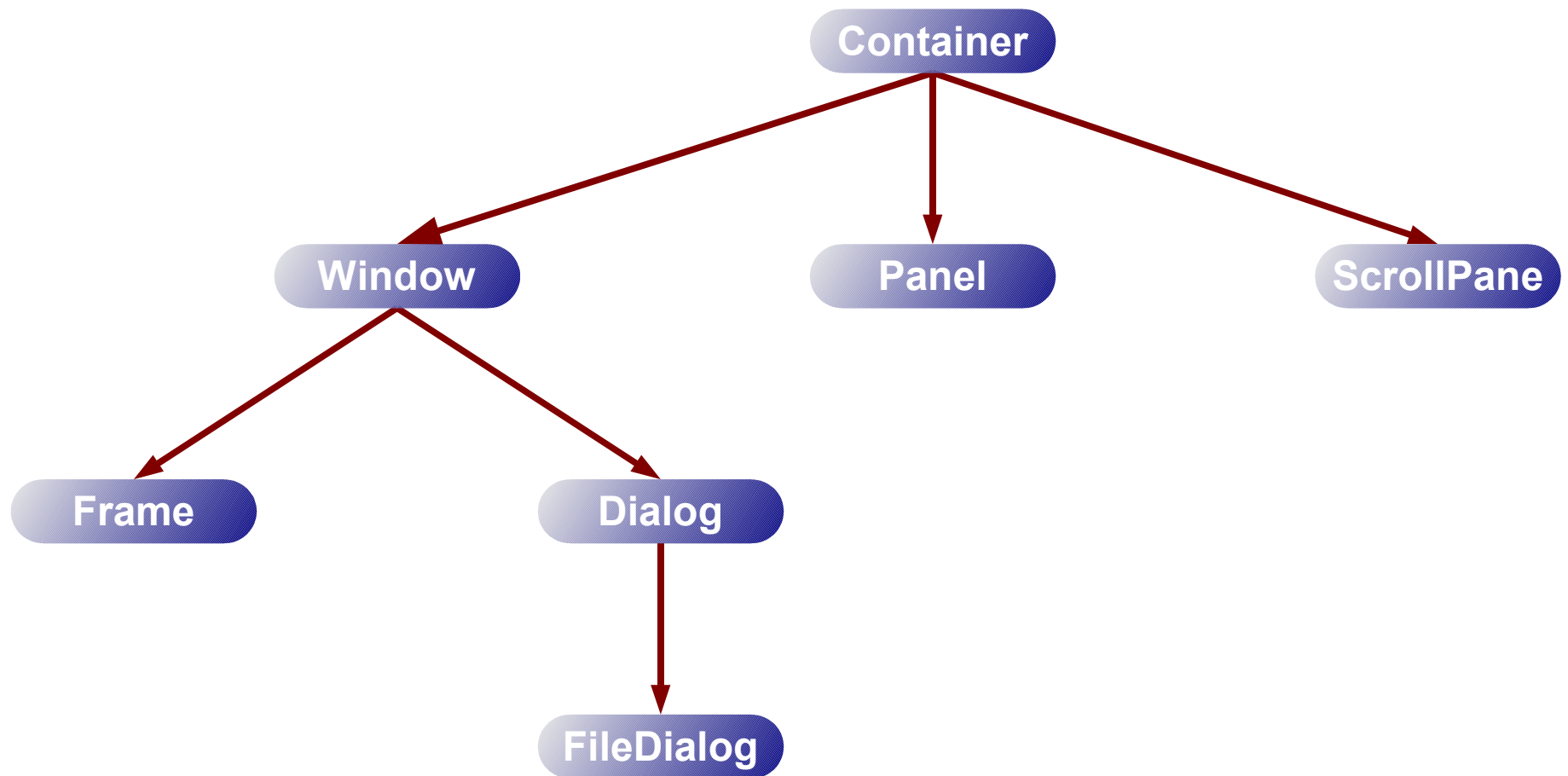


From the API

`java.awt.Container`

An AWT **container** is a component that can **contain** other AWT components

Containers Hierarchy



Components



Controls

- ▶ Buttons
- ▶ Checkboxes
- ▶ Choices
- ▶ Lists
- ▶ Menus
- ▶ Text Fields
- ▶ Text Areas
- ▶ Scrollbars

Layout Managers



Overview

- ▶ Parent class:

 - `java.awt.LayoutManager`

- ▶ Manage the way Components are laid out inside Containers

- ▶ On the container

 - ▶ The `setLayout()` method

- ▶ Example

 - `myFrame.setLayout(new FlowLayout());`

Layout Managers in AWT

- ▶ Simple
 - ▶ FlowLayout
 - ▶ GridLayout
- ▶ Special purpose
 - ▶ BorderLayout
 - ▶ CardLayout
- ▶ Highly flexible
 - ▶ GridBagLayout

Example

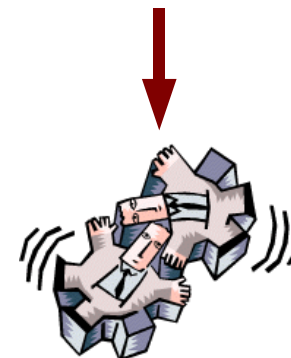
Layout Managers Demo

Events and Listeners



Listeners

- ▶ A listener ...
 - ▶ Listens to Events



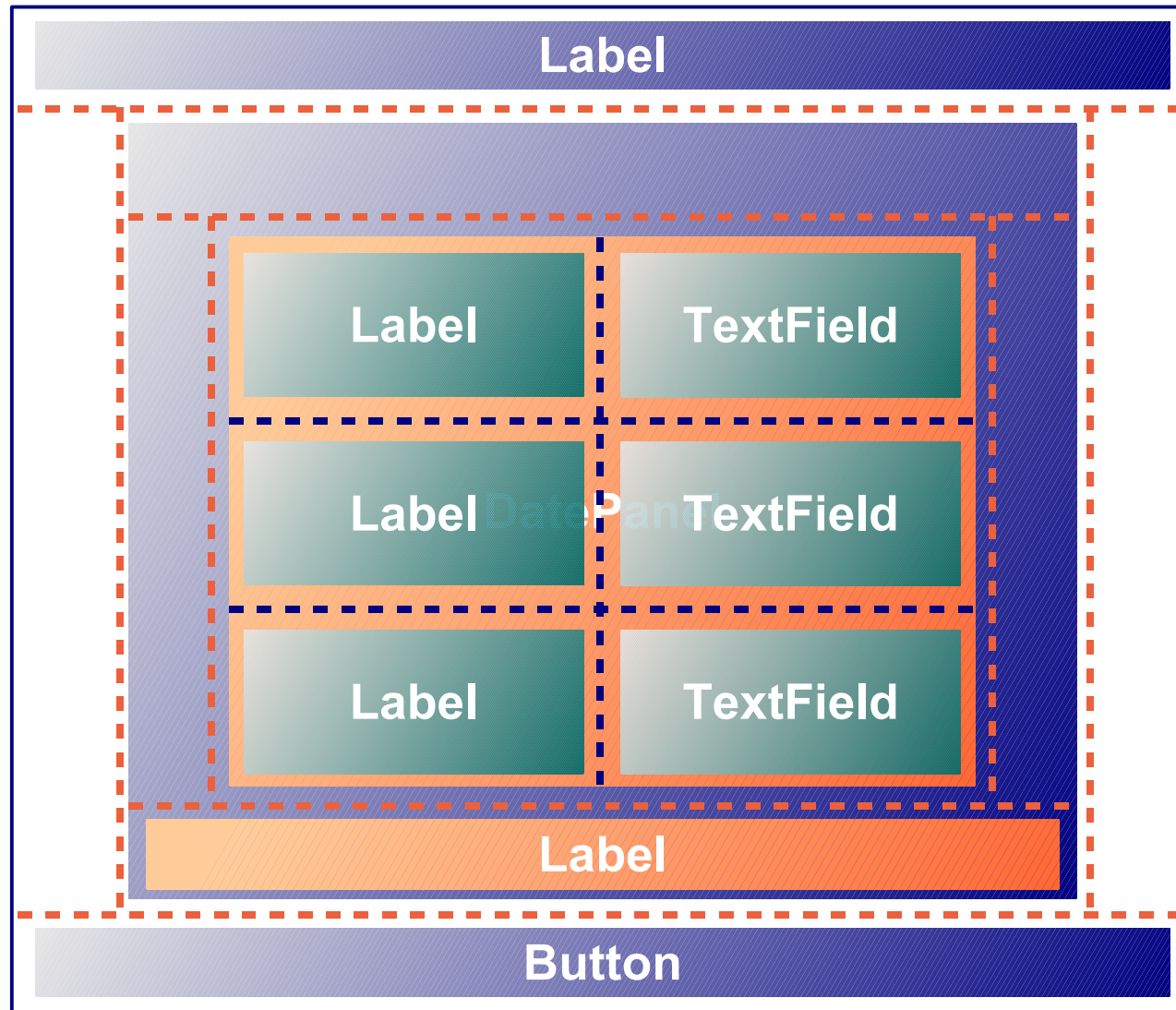
Event Handlers

- ▶ An event handler is
 - ▶ A class implementing a listener
 - ▶ Used to react to event
- ▶ How to use
 - ▶ Create a class extending a given listener
 - ▶ Register an instance of this class in the component sending events

Example

Age Calculator Example

Example Layout



Conclusion



GUI and AWT

- ▶ Basic concepts for GUI
 - ▶ Containers
 - ▶ Components
 - ▶ Layout managers
 - ▶ Events
 - ▶ Event listeners
- ▶ AWT has limited functionalities
- ▶ Better use Swing than AWT

See you next week