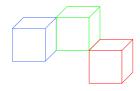
# **Application Frameworks**



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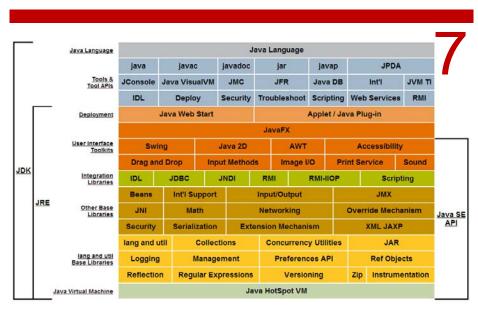
## **OO Application Frameworks**

- is a set of cooperating classes that represent reusable designs of software systems a particular application domain.
- typically consists of a set of abstract classes and interfaces.
- partially complete application that can be specialized to produce custom applications.

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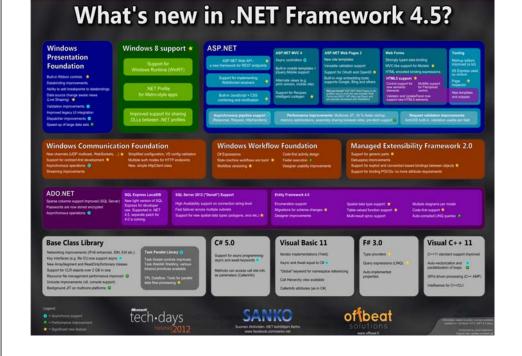
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http://docs.oracle.com/javase/7/docs/





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## Specific Frameworks

#### The collections framework

a set of interfaces and classes that support storing of objects using various data structures, algorithms, and complexities.

#### The graphical user interfaces framework

a set of interfaces and classes that support the construction of GUIs.



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#### **GUI Framework**



Components & Layout

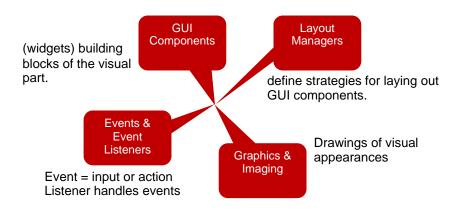
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## **GUI Framework**

Consist of several categories of classes.





# Two Packages

Abstract Windows Toolkit (AWT)

package: java.awt

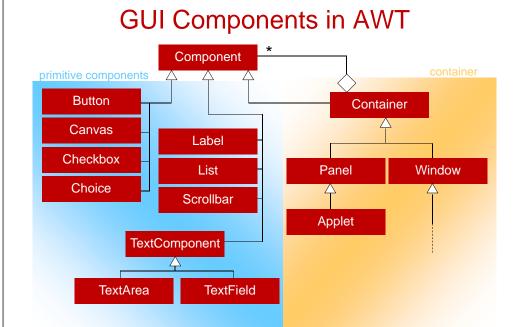
Swing

package: javax.swing

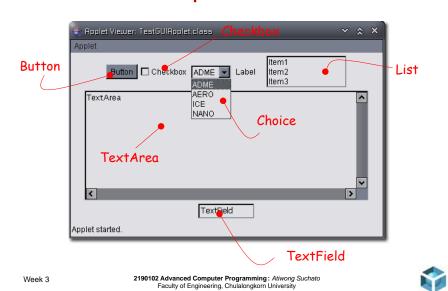
Several hundred classes and many subpackages support building of highquality GUIs



#### **GUI Components in AWT** Component --, UML Notation for "Composition" **Button** Container Canvas Label Checkbox **Panel** Window List Choice Scrollbar **Applet TextComponent TextField** TextArea 2190102 Advanced Computer Programming: Atiwong Suchato Week 3 Faculty of Engineering, Chulalongkorn University

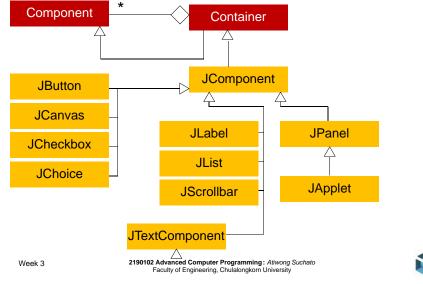


# **GUI Components in AWT**



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# **GUI Components in Swing**



## **Layout Managers**

- handle the layout of the components contained in a container.
- Components are displayed based on their relative positions.
- No absolute co-ordinates / No absolute dimension.

position based on positional constraints

computed based on dimension of the container.

or

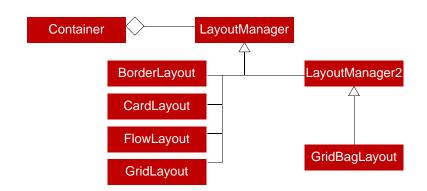
order that components are added.

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## **Layout Managers**



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# **Layout Manager Examples**





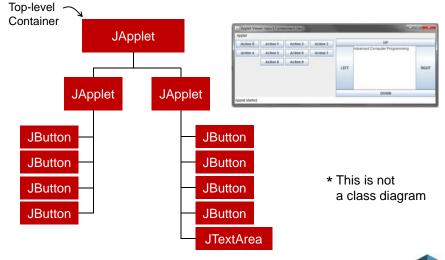
TestFlowLayoutApplet.java

BorderLayoutApplet.java



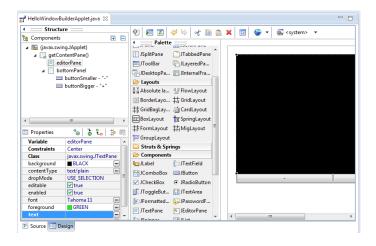


# **Containment Hierarchy**



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# Generating GUI Code with Tools



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# **Using JFrame**

```
public static void main(String[] args) {
   SwingUtilities.invokeLater(.....);
}

An object of a class implementing the Runnable interface.

When the program is ready for the GUI to be constructed, the run() method of [] will be called.
```

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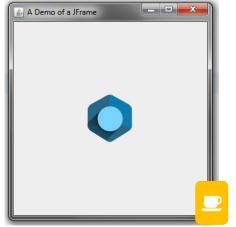
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# Using JFrame

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# JFrame Example



DemoJFrame.java

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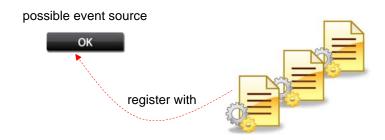
# **GUI Framework**



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# **Handling Events**



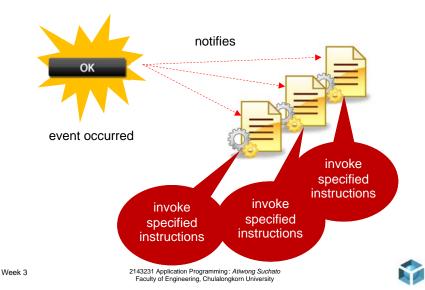
Handler classes that implement the listener interface associated with the event possibly generated from the event source.

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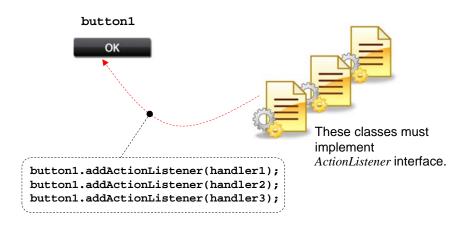
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# Handling Events



## ActionEvent for Button



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#### Implementing ActionListener interface

```
class MyButtonHandler1 implements ActionListener{
      public void actionPerformed(ActionEvent event){
             // Instructions to be performed.
```

#### button1

button1.addActionListener(new MyButtonHandler1());

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## **Naming Convention**

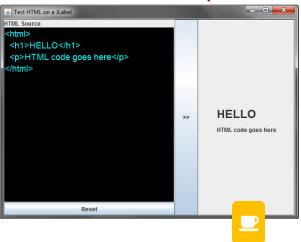
- The names of event classes end with the suffix Event.(E.g. ActionEvent)
- For XyzEvent, the listener interface is usually named XyzListener (E.g. ActionListener). If there is an adapter class, it will be named XyzAdapter.
- For a listener that implements the interface XyzListener the name of the method to register the listener to its source is addXyzListerner(). (E.g. addActionListener())

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# **Event Example**



# Self-Study for Topic 3

# Lesson: Using Swing Components http://docs.oracle.com/javase/tutorial/uiswing/components/index.html

#### Read pages under

- "The JComponent Class"
- "Using Text Components"
- "How to Use Buttons, Check Boxes, and Radio Buttons"
- "How to Use Labels"
- "How to Use Panels"
- "How to Use Sliders"

#### **Lesson: Writing Event Listeners**

http://docs.oracle.com/javase/tutorial/uiswing/events/index.html

#### Read pages under

- "How to Write a Mouse Listener"
- "How to Write a Mouse-Motion Listener"



HtmlLabelDemo.iava

# Self-Study Test: Topic 3

The test must be done during:

Saturday 30 August to Monday 1 September

in the "Assessment" section of



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