CS 1181
Week Four

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Review

- A good class is
  - Testable
  - Has Robust Exceptions
  - Encapsulated Behavior
  - etc.

Moving Forward

- That’s cool I guess
- We have a lot of tools
    - But how do we build real applications?

Moving Forward

- Not like command line apps
- Real graphical applications

- CLI = Command Line Interface apps
- GUI = Graphical User Interfaces

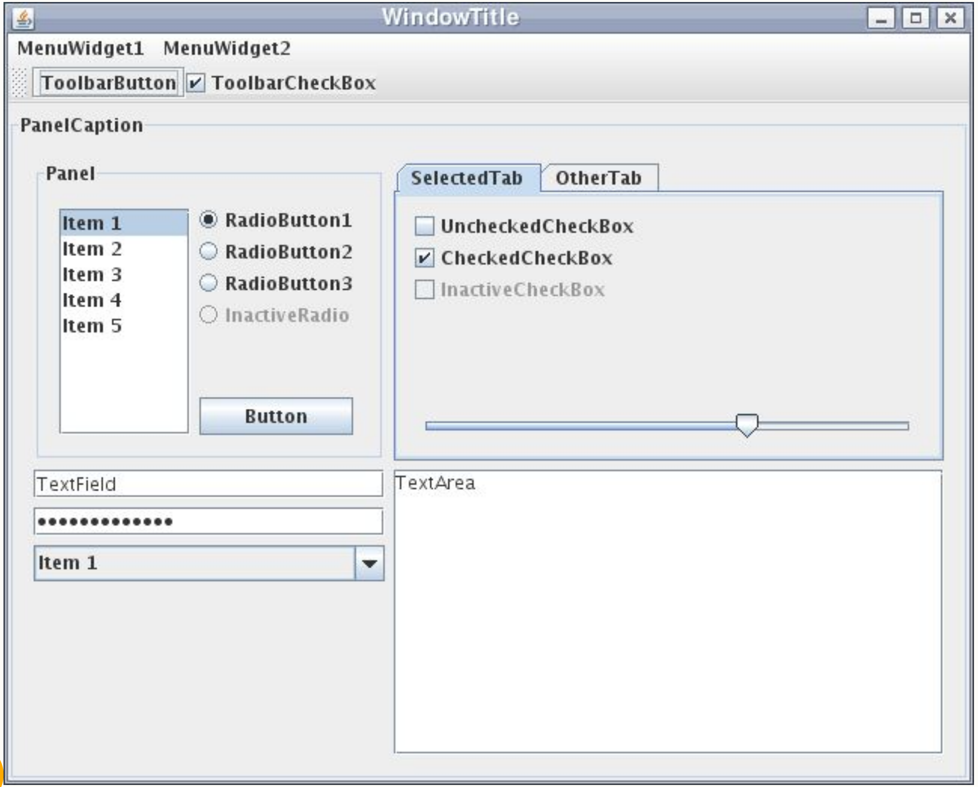
Moving Forward

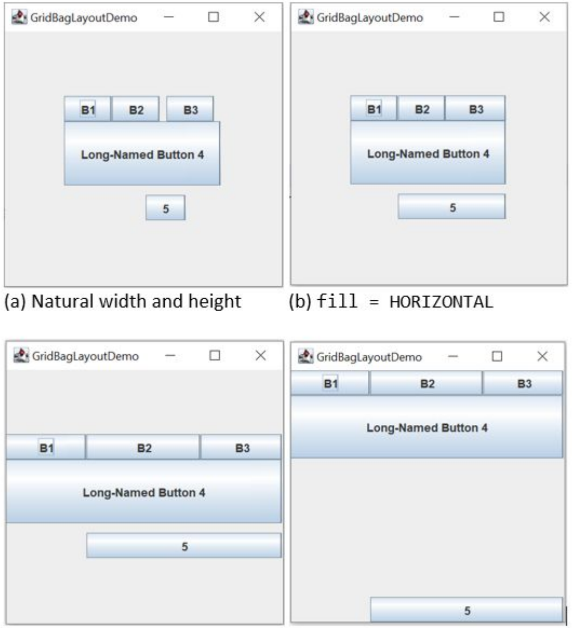
- CLI’s are usually developer/power-user facing
- GUI’s are more user focused

GUIs

- Java's primary GUI library is *Swing*
- Built into java
- No external libraries needed
- Cross platform GUI framework

GUIs





(a) Natural width and height

(b) `fill = HORIZONTAL`

(c)
Column 1: `weightx = 0.5`
Column 2: `weightx = 1.0`
Column 3: `weightx = 0.5`

(d)
Row 1: `weighty = 0` (not participating)
Row 2: `weighty = 0` (not participating)
Row 3: `weighty = 1.0` (take all)

JFrame

- A JFrame represents an individual window
- JFrame is a class that you can use yourself
- Let’s do it!

JFrame

- JFrame frame = new JFrame()
  - Nothing happened
- Useful methods:
  - setVisible(boolean)
  - setSize(int, int)
  - setTitle(String)
  - setDefaultCloseOperation(int)

Let’s add some more things

- Swing provides a series of pre-written components
- We can use these in our program to make our GUI
- All prefixed with “J”

JLabels

- Let’s add some text
- JLabel class
- Nice constructor and setter

- Can we add more?

Let’s add some more things

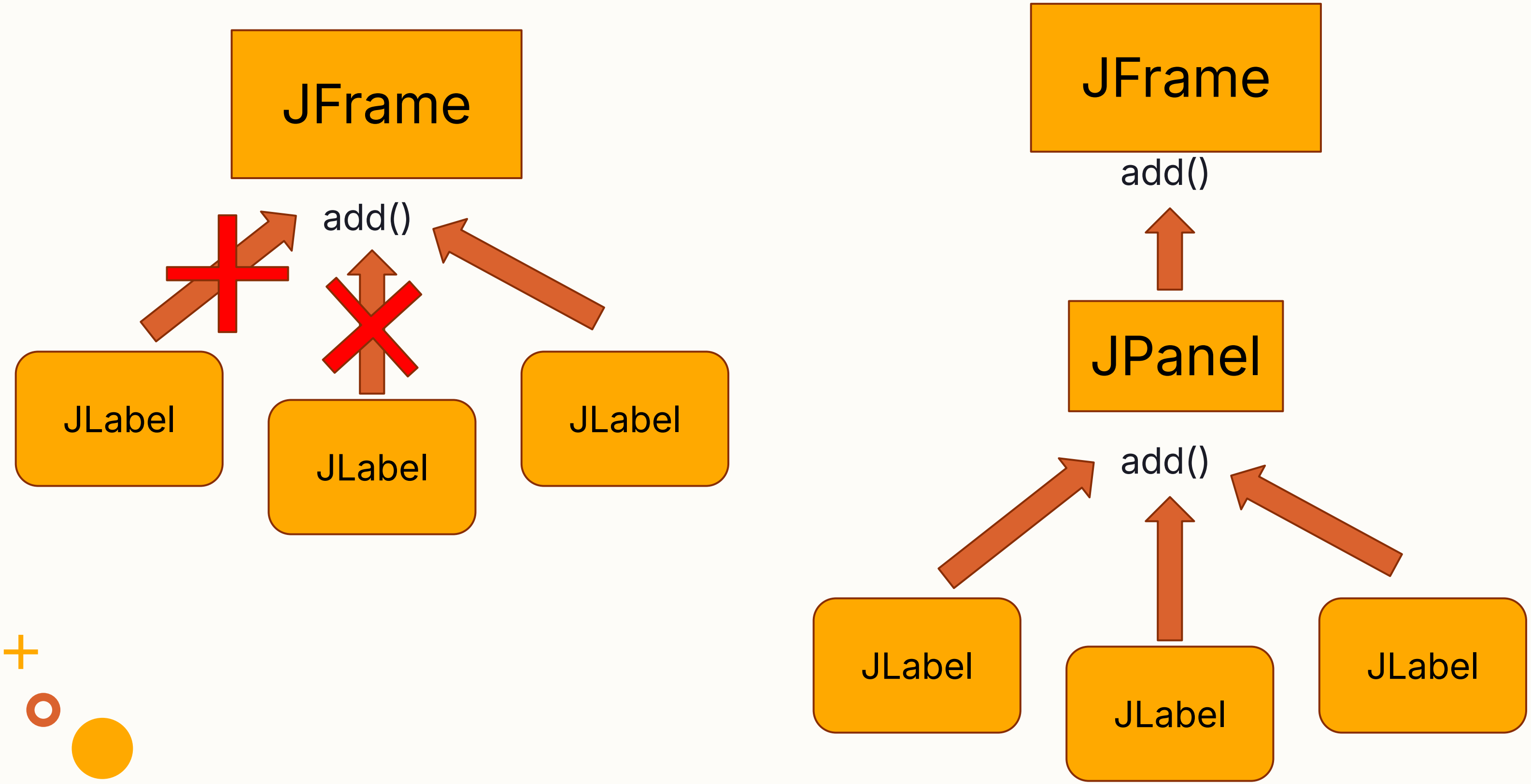
- What happened?
- 2nd label clobbered the 1st

- JFrame can only hold a single swing component
- So how do we fix this?

JPanels

- Swing gives a “container” class
- JPanel
  - Let’s you add sub-components
  - Can add as many as you one

JPanels



JFrame

add()

JLabel

JLabel

JLabel

JFrame

add()

JPanel

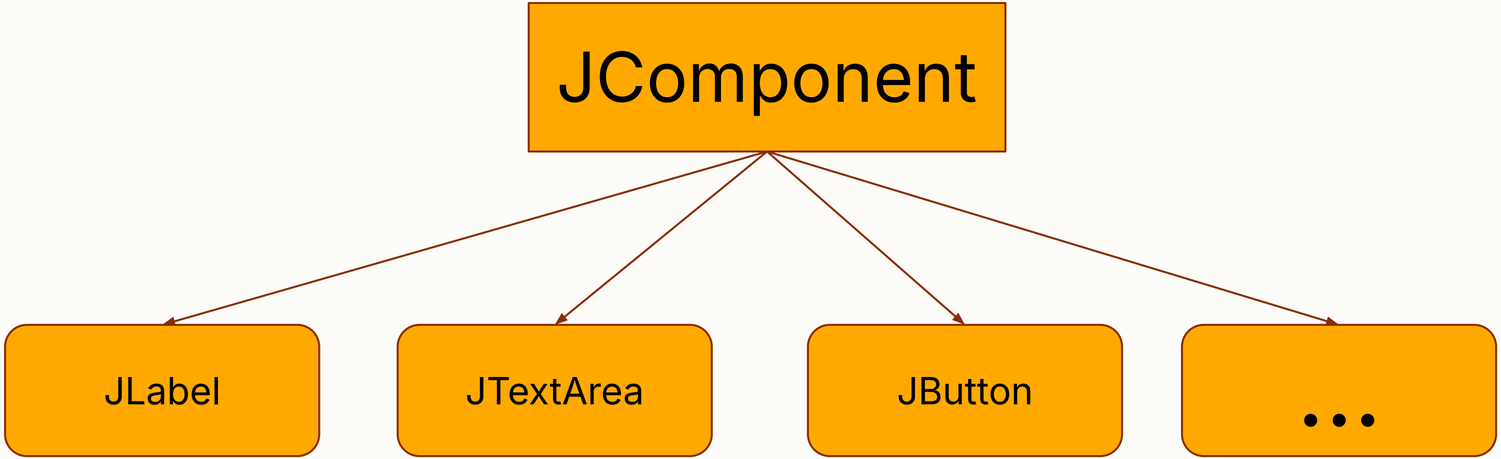
add()

JLabel

JLabel

JLabel

Let’s add some more things



- Let’s play around with some of these

JButtons

- JButton btn = new JButton
- btn.addActionListener(ActionListener)
- ActionListener documentation

JButtons

- JButtons let us make our GUIs do things
- Let’s play around with what they can do
- We can compose buttons in existing classes

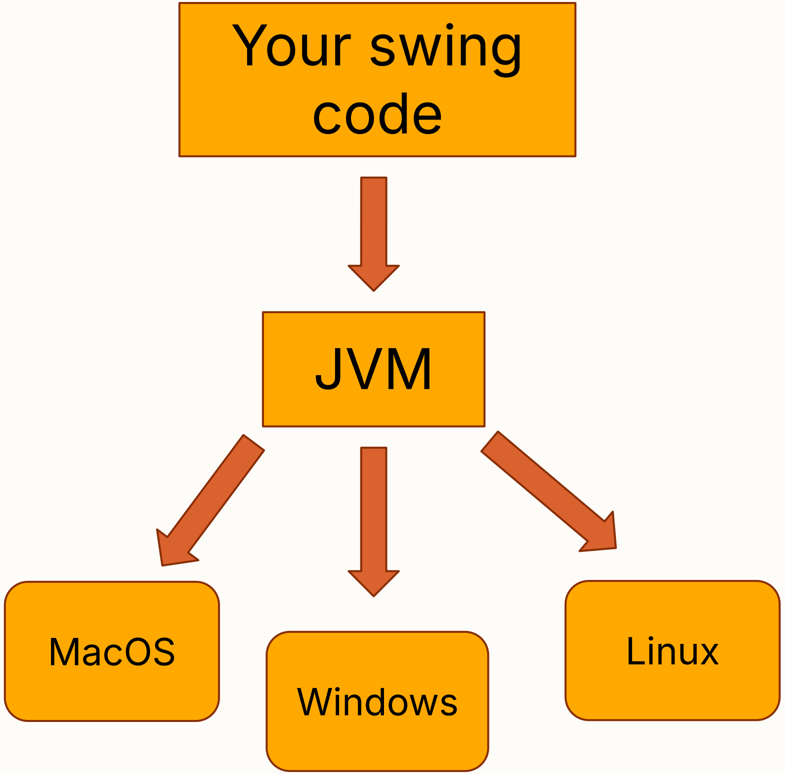
Aside: Why does it look ancient???

- Sun
  - Developed Java Swing
  - Switched to JavaFX
- Oracle
  - Removed FX from JDK (Why?)

- OpenJDK now maintains Swing
- Third party + open source maintains FX

Look and Feel

- Appearance of application
- OS Defaults


Your swing code
JVM
MacOS
Windows
Linux