§17.3: Swing Widget Layout

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Quiz 2

- In Java, what does final mean when applied to:
 - (a) attributes, (b) methods, (c) classes?
- Name and give a short description of each of the eight primitive Java types
- Write a short bit of Java code encoding these relationships:
 - "fido is a Dog."
 - "A Dog is a kind of Mammal."
 - "Every Mammal has a Heart."
 - "Any Dog can bark()."



Quiz 2: answers #1

- In Java, what does final mean when applied to:
 - Attributes: constant (read-only)
 - Methods: subclasses cannot override
 - Classes: cannot be subclassed



Quiz 2: answers #2

- Name and give a short description of each of the eight primitive Java types
 - boolean (1 byte): true/false
 - char (2): Unicode character
 - byte (1), short (2), int (4), long (8): integers
 - float (4), double (8): real numbers



Quiz 2: answers #3

- Write a short bit of Java code encoding these relationships:
 - "fido is a Dog."
 - "A Dog is a kind of Mammal."
 - "Every Mammal has a heart."
 - "Any Dog can bark()."

```
class Mammal { Heart h; }
class Dog extends Mammal { void bark(); }
Dog fido = new Dog();
```



Model-View-Controller

- Design patterns: reusable, generic concepts to help you design your programs
- MVC design pattern:
 - Model: stores data
 - Computation, methods to transform data
 - Data structure issues: arrays? Linked-lists? Classes?
 - View: display / output / read
 - println()? Swing? Web? JTextField?
 - Controller: manipulate / input / write
 - Command-line? Buttons? Mouse?



MVC in Swing

- Model:
 - Core content/functionality of program
 - Ideally, should be independent of Swing
- View:
 - JFrame, JPanel, layout manager, widgets
- Controller: Event handler:
 - implements ActionListener, ItemListener {
 - public void actionPerformed(ActionEvent e)
 - public void itemStateChanged(ItemEvent e)

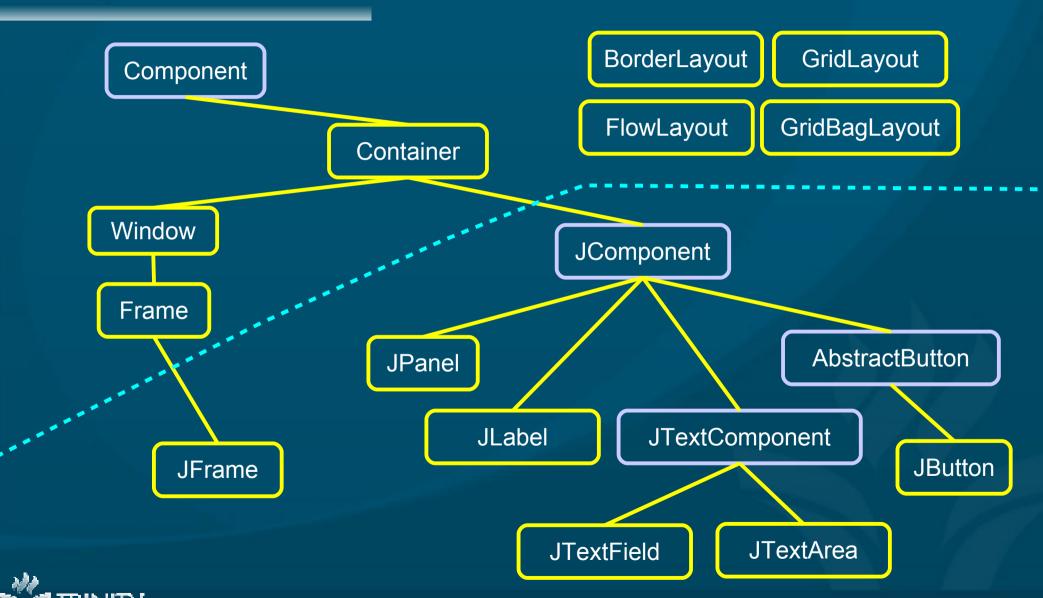


Swing container classes

- Containers (java.awt.Container) hold other components
 - Swing container: javax.swing.JComponent
 - Both JFrame and JPanel are Swing containers
 - Every JComponent can have one layout manager: decides how to arrange widgets
- JFrame: Swing window
 - Can only have one layout manager
 - But can nest JPanels: each JPanel can have its own layout manager



Swing / AWT class hierarchy



Layout Managers

- FlowLayout: simple left-to-right
 - setLayout(new FlowLayout());
 - JLabel label1 = new JLabel("Label One");
 - add(label1);
- BorderLayout: north, south, east, west, center
 - setLayout(new BorderLayout());
 - add(label1, BorderLayout.NORTH);
- GridLayout: table of equal-size cells
 - setLayout(new GridLayout(2, 3));
 - add(label1);
 - Fills left-to-right, then top-to-bottom

