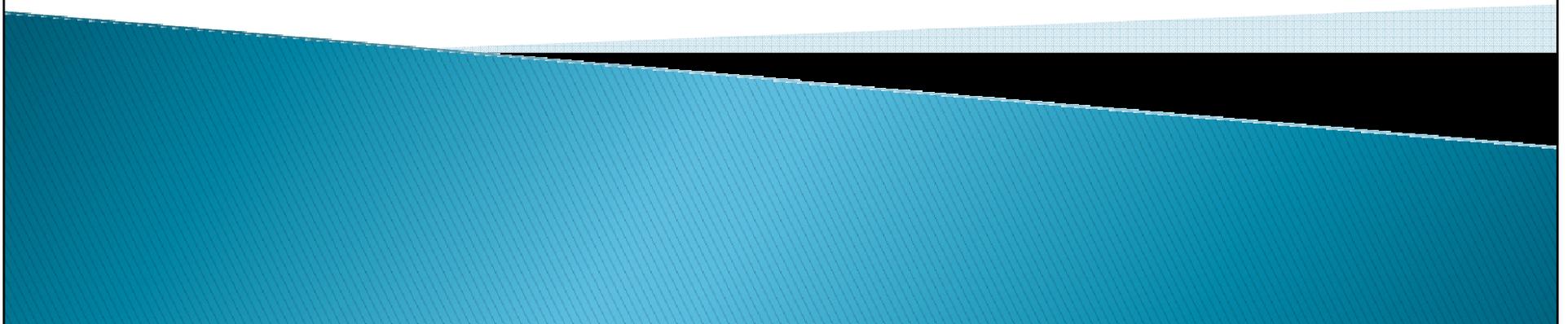
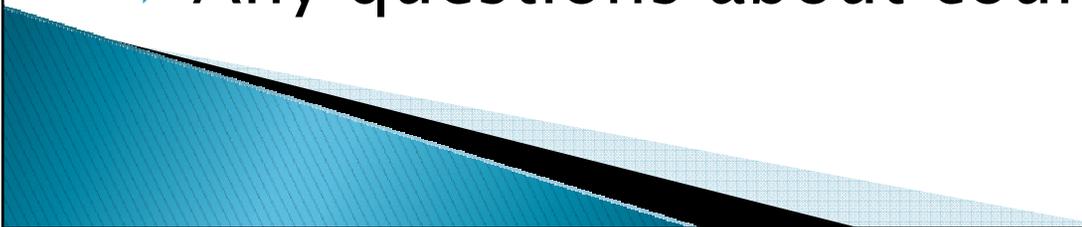


CSSE 220 Day 7

GUI programming in Java Using Swing



Announcements

- ▶ JUnit Testing exercise is due now.
 - ▶ Turn in your written problems from Assignment 6.
 - ▶ You should be done BigRational, but I'll extend due date until next class, so you can add extra unit tests or documentation.
 - ▶ Try to finish earlier so you can get an early day and start GUI programming!
 - ▶ Any questions about course material?
- 

GUIs in Python and Java

- ▶ Python provides an extensive GUI toolkit called Tkinter, which is built on top of the (not specific to Python) Tcl/Tk framework.
 - <http://www.python.org/doc/life-preserver/>
 - www.tcl.tk/software/tcltk/
 - [http://en.wikipedia.org/wiki/Tk_\(computing\)](http://en.wikipedia.org/wiki/Tk_(computing))
- ▶ In CSSE120, we did not use Tkinter directly
- ▶ Instead used ZelleGraphics
 - a simplified collection of classes for drawing on the screen.
 - Hides details that would be confusing to beginners in OOP.
- ▶ In Java, we'll see "the real thing": Swing

Swing resources

- ▶ Appendices in the Weiss book (sketchy).
- ▶ *Java Swing* by Cole, Eckstein, *et. al.*
 - This is a great Swing resource (for both learning and reference):
 - Available for you to read on Safari Tech Books Online
 - <http://proquest.safaribooksonline.com/?uicode=rosehulman>
Then find the Java Swing book
 - If that link does not work for you, go to the Logan Library page, and choose Safari from the Databases drop-down list near the top of the page, then click Go.
- ▶ SUN's Swing Tutorial at <http://java.sun.com/docs/books/tutorial/uiswing/index.html>
 - This one has great examples, but it tends to assume a deeper familiarity with Java than most of you have now.

Java GUI toolkits

- ▶ AWT (Abstract Windowing Toolkit) was part of the original Java release
 - Many features are still used
 - But users were dissatisfied ...
- ▶ Swing was standardized with Java 2 (1999)
 - The most widely used Java GUI toolkit.
 - The one we will study
- ▶ SWT (Standard Widget Toolkit) was developed by IBM for Eclipse
 - Simpler to get started with than Swing.
 - Has some limitations.

What is a GUI toolkit?

- ▶ A collection of *widgets* and ways to control their interaction with the user and with each others
- ▶ Examples of widgets
 - window
 - menu
 - button
 - text area
 - slider
 - scroll bar
 - ...

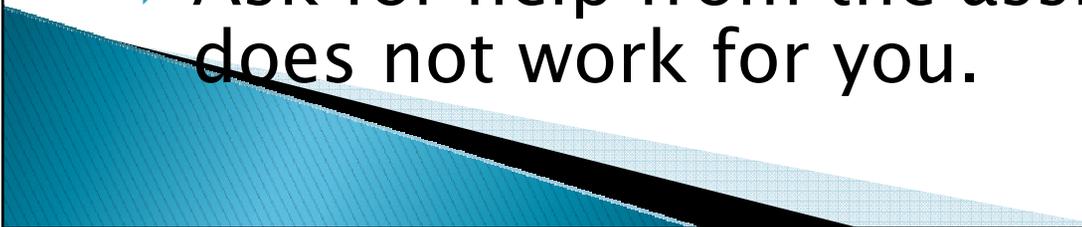
Some Classes That We will be Using

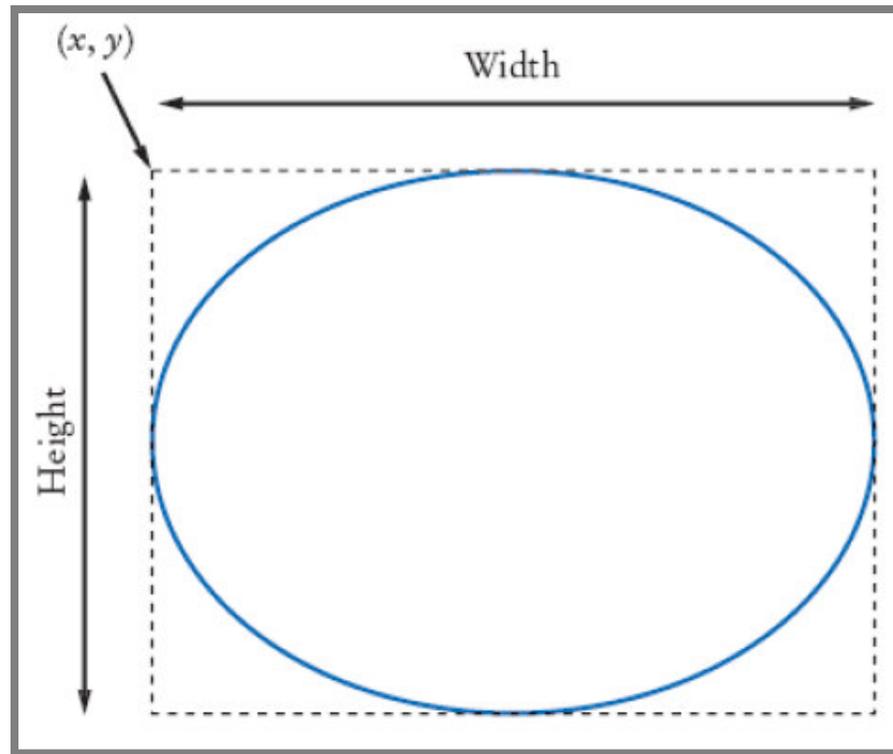
Class	What it is
JFrame	a top-level window
JComponent	a region where we can draw; also parent of many other widget classes
JButton	a JComponent representing a button. When clicked, an action can happen
JLabel	a place to put text in a window
JTextField	a place for the user to enter text
JPanel	a JComponent that can be used as a container for organizing other widgets
Graphics	an object that can draw things on a JComponent. We never have to create this object; it is provided to us by the system
Graphics2D	a more "object-oriented" graphics object
JOptionPane	Request a single line of input from the user,

Two Classes Needed for a Simple Application That Draws Things

- ▶ A JFrame in which to put our component(s)
- ▶ A JComponent in which to draw things
 - We need to extend JComponent
 - The extension class must provide a `paintComponent()` method that does the actual drawing
 - Sometimes we will extend JPanel, which extends JComponent.
- ▶ `paintComponent()` is automatically called when the program starts, and when the window is resized or unhidden.

Live Demo

- ▶ We will learn by doing.
 - ▶ After class, the notes for this live session will be posted, so you will have them for reference.
 - [220-Day07_200820-script.docx](#)
 - ▶ Many of the examples I use are based on Cay Horstmann's examples in *Big Java*.
 - ▶ This should be a lot of fun!
 - ▶ Ask for help from the assistants if something does not work for you.
- 



Message

Baseline

Basepoint

