CSSE 220 Day 7

GUI programming in Java Using Swing

CSSE 220 Day 7

- JUnit Testing exercise is due now.
- Turn in your written problems from Assignment 6.
- Everything for BigRational is due tomorrow at 8:05.
- "Not answering mail at night" does not mean "Please don't send me mail". It's about timing, not about lack of desire to help you.

Your questions about …

- Java
- Reading from the textbook
- Homework
- etc.

GUIs in Python and Java

- Python provides an extensive GUI toolkit called Tkinter, which is built on top of the (not specific to Python) Tck/Tk framework.
  - http://www.python.org/doc/life-preserver/
  - www.tcl.tk/software/tcltk/
  - 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 wthat 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 the best Swing resource, in my opinion (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

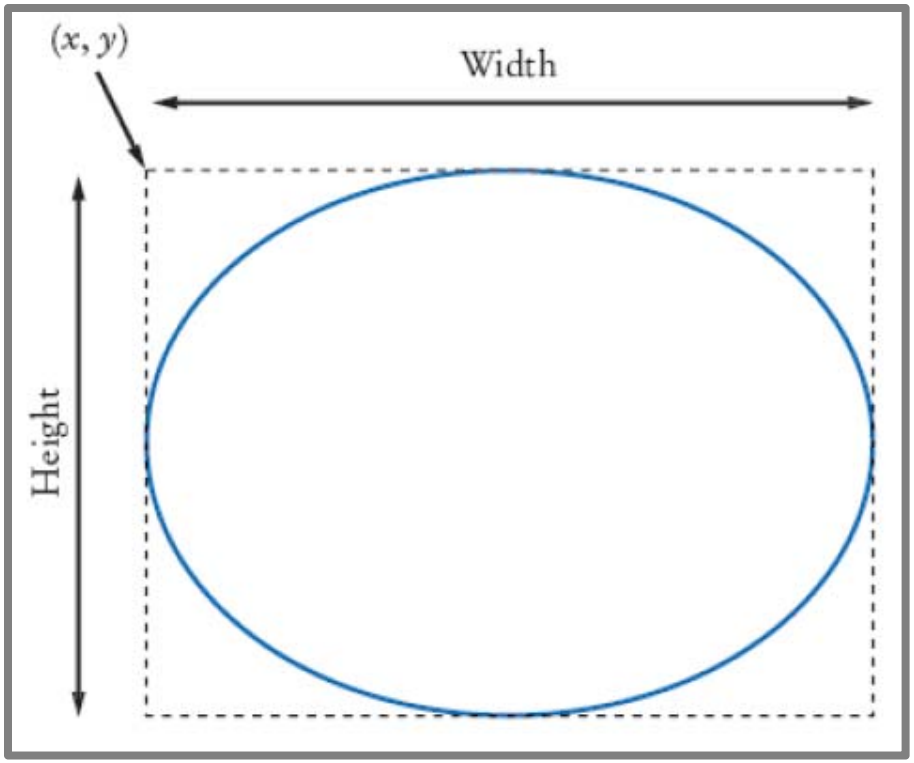
- A JFrame in which to put our component(s)
- A JComponent in which to draw things
  - We need to extend JComponent
  - The extension class must provide a **paintComponent( )** method that does the actual drawing
  - Sometimes we will extend JPanel, which extends JComponent.
- paintComponent() is automatically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

Live Demo

- We will learn by doing.
- After class, I will post my notes for this live session, 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.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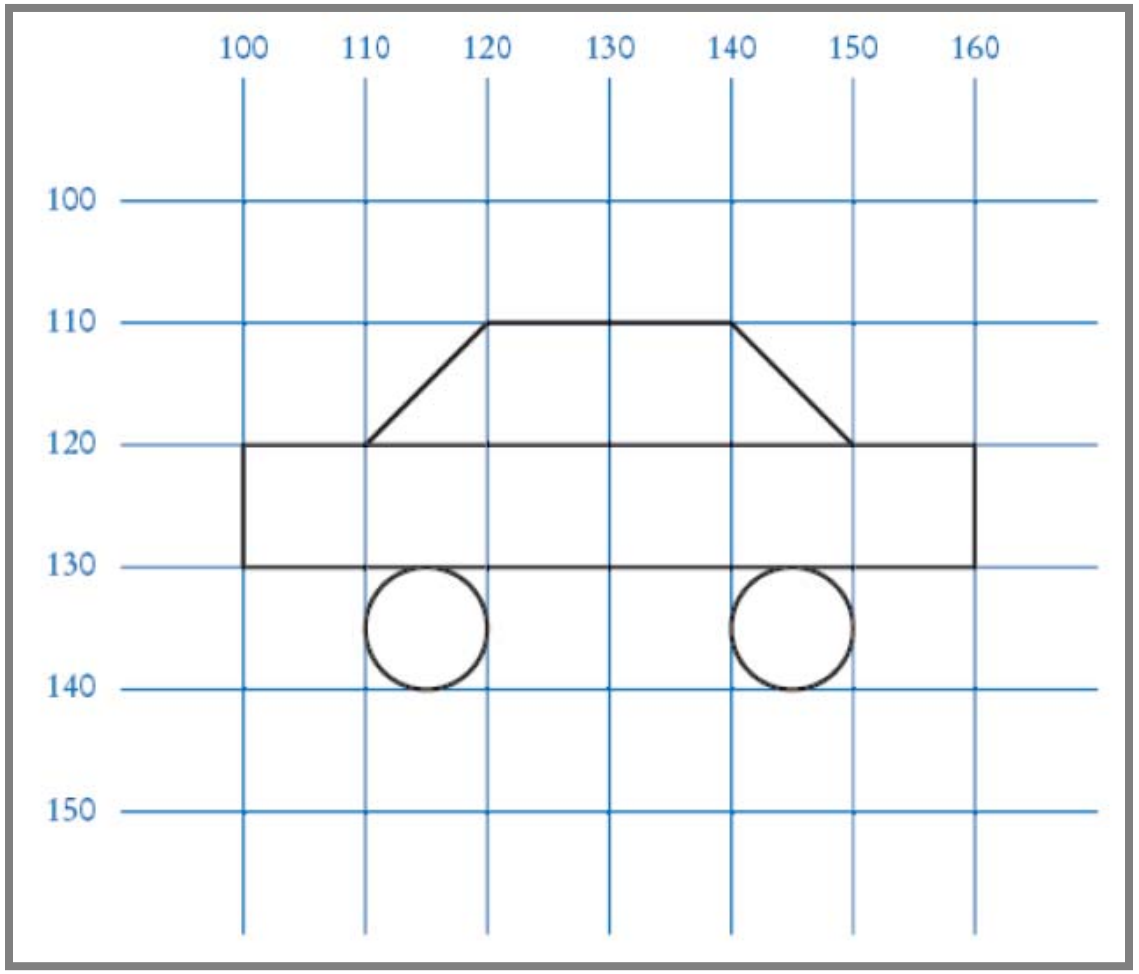
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To do before Session 8

- The next reading assignment.
- No ANGEL quiz today.
- No Written problems today.
- Finish BigRational.
- Experiment with some of the things we did in class.
- Read documentation, etc. Especially Shape classes.