Java Graphics

Slides derived from the work of
Dr. Amy McGovern and Dr. Deborah Trytten
Graphics are fun!

• Demo...
How do I draw?

- Extend a JPanel
- Override:
  - protected void paintComponent(Graphics g)
  - Don’t do this on a class already subclassing JPanel like JButton!
  - Draw your graphics inside paintComponent
  - Called autonomously using event handling
Drawing in the right spot

Remember to manage your coordinates

• Where is 0,0?
• How “tall” is the screen?
• How “wide” is the screen?
• Which way is positive x? Positive y?
• Are coordinates relative or absolute?
Drawing shapes

• Graphics class provides a LOT of useful drawing utilities
  • drawLine, drawArc, drawRect, drawString, ...
    • Can do fill versions of those too
  • Examine Graphics API

• Graphics2D provides more
  • draw(Shape s)
    • Define a general shape and draw it to the screen
  • Examine Shape API (and Graphics2D API)
Words/Strings

• `drawString` draws the string
• `Font class: selecting fonts`
• `FontMetrics class: managing fonts`
  • Can measure the extent of a String before it is displayed
  • Use to center text automatically
Example

Make a two panel GUI

• Top panel has text centered “Have a nice day!”
• Bottom panel shows the smiley face from previous example
Images

• ImageIcon is fixed size
  • Rendering: ImageIcon.paintIcon()

• Image is flexible
  • Rendering: Graphics.drawImage
Adding Animation

Need:

• An object to keep track of where the item you are drawing is
  • `paintComponent()` will use this information to properly place the object

• Control loop to update its coordinates

• Sleep between animation frames:
  • `Thread.sleep(ms)`

• Don’t forget to call `repaint()`!
Adding Animation: Alternative

Need:

• Use a Timer to trigger the control loop (coming soon)
Example

• Make a four panel screen of bouncing smileys (one per panel)
Example

• What do you want to draw/animate?