Java Graphics

Slides derived from the work of
Dr. Amy McGovern and Dr. Deborah Trytten
How Do I Control How a Panel is Rendered (at a pixel level)?

• Extend the component
• Override:
  • protected void paintComponent(Graphics g)
  • Draw your graphics inside paintComponent
  • This method is called autonomously using event handling & never in your own code
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 Images

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

• Image is flexible
  • Rendering: Graphics.drawImage
Drawing shapes

Graphics class provides a LOT of useful drawing utilities ***

• Drawing icons
  • Icon.paintComponent()
  • Example

• Primitive shapes: drawLine, drawArc, drawRect, drawString, ...
  • Can do fill versions of those too
  • Example...
Graphics Words/Strings

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

Graphics2D provides more operations:
• `draw(Shape s)`
• Define a general shape and draw it to the screen
• Examine Shape API (and Graphics2D API)
• Example....
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 bouncing smiley ...
Example

• What do you want to draw/animate?