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?