Graphics

10-29-2010

Opening Discussion

- Solutions to the interclass problem.
- Do you have questions about the assignment?
- Minute essay comments:
  - Could you write Sudoku or Battleship?
  - Fixing in-class code.
  - Courses that use GUIs.
  - Saving changes in Pokemon.

Motivation

- You can do lots of things with the standard GUI elements in Swing.
- We could set up quite a bit of a GUI using that. However, no GUI library can predict everything that you will want to do and we want to be able to add custom drawing to our applications.
- Uses:
  - Drawing Pokemon on battlefield.
  - Drawing Dinosaurs.
  - Drawing anything there is a GUI component for.

Graphics in Scala/Java

- For this we will rely on the Java2D library. Java2D was added about the same time Swing was and it is fundamentally based on the java.awt.Graphics2D class.
- Let's go find the Java API and find this class in it.

Making Custom Drawn Components

- We are going to follow a simple approach to doing this making a new Panel that draws what we want.
  - new Panel {
    - override def paint(g:Graphics2D) {
    - ...
    - }
  - }
- Whatever you draw to g appears in the panel.

Capabilities of Java2D

- Let's look a bit at the Graphics2D class to see what some of the possibilities might be for what we can draw.
- The java.awt.geom package and the java.awt.image package also have some useful things in them.

Settings

- There are several things that we can set on the Graphics2D object that are used when we draw things. Here are some:
  - Paint – could be a color, but there are also gradients and textures
  - Stroke – determines how lines are drawn
  - Font – how you want text to appear
  - Transform – AffineTransform allows translate, rotate, scale, or shear

Less Used Settings

- Composite – how colors combine when you draw over old stuff
- Clip – where your drawings will appear
- Render hints – other things like antialiasing

More General Drawing

- Of course, Graphics2D objects aren't limited to just drawing on components.
- The Image class (and it's subtype BufferedImage) will let you get Graphics objects that you can draw to and what you draw will be on the image.
- We'll typically do this even if we are drawing to a component to implement buffering which reduces flicker.

Loading Images

- The easiest way to load images from disk is using javax.imageio.ImageIO.
- This class has read methods that take File or URL objects.

Minute Essay

- What are your thoughts on Scala? What do you see as its strengths and weaknesses for this course.
- Make sure to give me your “higher priority courses” as soon as you know them.
- Interclass problem:
  - Write a script that has a custom drawn panel with something in it. Try to listen to the mouse Publisher in the panel and do something with the different MouseEvents.