Graphics

10-28-2011

Opening Discussion

- Minute essay comments:
    - Can't type as fast as me in vi.
    - Deciding between panels.
    - Retails of publisher/reactor model.
    - Coding of graphics intensive games.
    - Sorting the in-class code by date.
    - What is my take on Anonymous.

Adding to our GUI

- I want to make the GUIs we wrote last time put data into the tables before we move forward today.

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 a shot-chart in basketball.
    - Drawing Dinosaurs.
    - Drawing anything there isn't 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

- 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

- How do you think we would go about creating animation?