

Graphics

10-31-2011

Opening Discussion

- Minute essay comments:
 - Getting clock information.
 - Are we going to have lots of imports?
 - Limiting options in a text game.
 - How do you know when to do an import?
 - Can you make non-geometric drawings?

More General Drawing

- Graphics2D objects aren't limited to just drawing on components.
- The Image class (and its 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.

Double Buffering

- The “proper” way to write the paint method is to have a `BufferedImage` that you draw to, then draw the image to the provided `Graphics2D` object.
- This is called double buffering and it prevents flicker and can make things run faster.

Mouse Events

- There are several types of events that relate to the mouse.
 - MouseClicked
 - MouseDragged
 - MousePressed
 - ...
- Listen to one of the publishers on a component.
 - `mouse.clicks`
 - `mouse.moves`
 - `mouse.wheel`

Key Events

- There are three event types for keys.
 - KeyPressed
 - KeyReleased
 - KeyTyped
- Listen to the keys object in a component to get these.
- Compare the key value in the event to values in the Key object.
 - `if(e.key==Key.A) ...`
 - `if(e.key==Key.Left) ...`

Animations

- For animations and many other things we want code to happen at regular intervals.
- We can set this up with a `javax.swing.Timer`.
 - `new Timer(delay: Int, ae: ActionListener)`
 - Delay is in milliseconds.
 - `Swing.ActionListener(handler: (ActionEvent) => Unit)`
- The function body will be executed at the desired intervals.

Writing Transforms

- Last time we mentioned `AffineTransforms`, but didn't see what they can do.
- Let's take some time now to write code that uses an `AffineTransform` in our drawing.

Minute Essay

- Questions about graphics?
- There is an IcP next class.