Ch 14 Shapes, Mouse Events, Timer, Audio

These notes cover sections 14.5 - 14.8.

14.5 Drawing Shapes
Components have an associated Graphics object that is used to draw lines and shapes.
The shapes are implemented as methods of the Graphics class. They're listed on p. 881.

Two ways to get Graphics objects:
1. They are a parameter to `paint( Graphics g)` method in Applet or `paintComponent( Graphics g)` method in JPanel
2. JPanel has a `getGraphics()` method

The first method is more common. Overriding the paint() or paintComponent() method is one reason to create a subclass of JApplet or JPanel.
Note the **super.paint()** call in many of our text examples. This is required to let the JApplet superclass correctly update all its components.

This is your coordinate system for drawing below. (0,0) is in the upper left. The X axis runs horizontally (from 0 to 299 below). The Y axis runs vertically (from 0 to 199 below).

Figure 14-17 *X and Y coordinates on a 300 pixel wide by 200 pixel high component*

(0, 0)   (299, 0)

•
(149, 99)

(0, 199)   (299, 199)
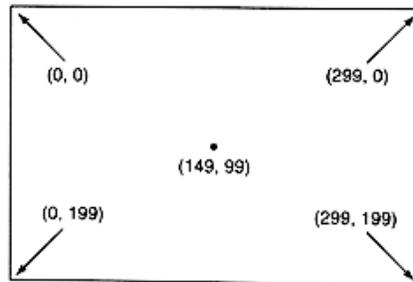
Component `paint()` method is called automatically as needed. To force a re-draw of a GUI Component, call `repaint()`.

The `paintComponent()` method is used for Swing Components like JPanel and JFrame.

Ch 14.6 Mouse Events

`MouseListener` is very similar to `ActionListener`. Register a MouseListener object with the `addMouseListener( MouseListener m)` method. It includes 5 methods:

- `mousePressed( MouseEvent e)` - when mouse button is pressed
- `mouseReleased( MouseEvent e)` - when mouse button is released
- `mouseClicked( MouseEvent e)` - when mouse button is pressed and released without moving
- `mouseEntered( MouseEvent e)` - when cursor enters
- `mouseExited( MouseEvent e)` - when cursor exits

Sometimes, it's a drag to code up all 5 methods every time you want to use the mouse. So…
`MouseAdapter` is an abstract class where you can override the methods you want to catch. Listener methods that you don't override do nothing.

/ p 909 - Java provides an adapter class for all the interfaces in the API that have more than one method */*

`MouseMotionListener` gives you finer control with `mouseDragged()` and `mouseMoved()`.

Ch 14.7 Timer Objects

From p 911 - `Timer` object regularly generates action events at programmer-specified times
The ctor is:

        Timer(int delay, ActionListener listener)

The delay is in milliseconds. Timer methods include: `start()`, `stop()`.

Ch 14.8 Audio

`AudioClip` is an interface with 3 methods: `play()`, `loop()`, `stop()`.
You can get an AudioClip using a static method in the Applet class:

        AudioClip Applet.getAudioClip(URL location, String filename)

The Applet class also has a `play( URL, fileName)` method that can be called directly.