Administrivia

- Reminder: Homework 5 code due today.

- Homework 6 due dates posted (design a week from today, code the following Tuesday).

Slide 1

Minute Essay From Last Lecture

- (The question was about how you could use the game's menu bar and/or panels on the four sides of the playing field to improve your game.)

- Many people mentioned displaying a score, lives left, a timer, etc. All sensible.

- Several people mentioned adding a "restart game" menu option. Very doable, if a little tricky (since you have to reset everything to its initial state).

Slide 2

GUIs in Java — A Little More

Slide 3

- (Look briefly at sample program with dialogs.)

Graphics in Java — Custom Components

Slide 4

- Predefined components (`JButton`, etc.) do a lot, but what if you want something that's not provided? in particular, you want to control the image yourself?

- Make a custom component — define a subclass of a component that provides some of the needed functionality, and override the method that defines what's displayed.

  E.g., subclass `JPanel` and override `paintComponent`, to include your code to "paint" the panel.

- Call `repaint` when ready to redisplay.

Custom Painting

Slide 5

- Method to override is

  `public void paintComponent(Graphics g)`.

  `g` is a "graphics context" that you can draw on. (Actually it's a `Graphics2D`.) Tutorial recommends calling `super.paintComponent(g)` before doing anything else.

- Can get dimensions of panel with `getSize`, `getHeight`, `getWidth`, `getInsets`.

- Can set colors, draw shapes, lines, text, etc., etc. — see `Graphics` and `Graphics2D` class. Coordinate system is similar to what you're using in your game. See code in `BasicBlock` for simple example.

Custom Painting, Continued

Slide 6

- General advice — look over the methods of `Graphics` and `Graphics2D`; if confused, follow links to tutorial(s) and look for a suitable example to adapt.

- Let's look at example(s) . . .

Minute Essay

- In the example shown in class (`ShowImageFromFile` on sample programs page), what would you put in `paintComponent` in `ImagePanel` to fill the panel with a white rectangle with an outline of a red rectangle inside?

Slide 7

Minute Essay Answer

- You could do something like the following:

```
g.setColor(Color.white);
g.fillRect(0, 0, getWidth(), getHeight());
g.setColor(Color.red);
g.drawRect(20, 20, getWidth()-40, getHeight()-40);
```

Slide 8