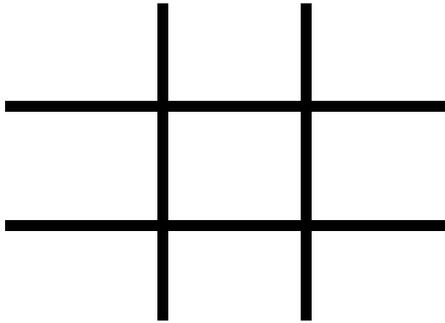


Exercises: Simple Graphics



1. Make a popup window that draws an empty tic-tac-toe board. I.e. something that draws four lines and looks like the picture on the left. Assume that the JPanel is exactly 300x300 (make the JFrame 320x340 so that about 300x300 is left after accounting for the title bar and borders) Also, don't worry about making the lines more than 1 pixel thick. Setting an exact size for the JPanel and making thick lines can both be done in Java, of course, but we didn't cover how.

- 2.** Make another version of the TTT application, but this time the drawing code should *not* know the panel size ahead of time, but instead use the panel's `getWidth` and `getHeight` methods to compute the size before drawing. Interactively stretch the frame to be different sizes, and be sure your drawing changes accordingly. Feel free to assume that the width and height are the same as each other (i.e., the panel is roughly square), but if you feel inspired, think about how to make the TTT board look square even when the panel is not.
- 3.** Make a red window that draws 50 small yellow circles at random locations within the window. The drawing code should not know the panel size ahead of time. Interactively stretch the frame to be different sizes, and be sure your drawing changes accordingly.
- 4.** Copy the Bill Gates image from my simple-graphics-exercises project, or go to <http://images.google.com/>, search for "Bill Gates", and save one of the images to your project folder. Make a popup window that draws the image. Remember that the image goes in a location relative to the root of the *compiled* code. So, if you specified "Use project folder as root for sources and class files" when you created the project, the folder containing the image will go in the top level of the Eclipse project. If, on the other hand, you specified "Create separate folders for sources and class files", then the folder containing the image will go in the top level of the bin (not src) folder.

Having the frame automatically fit the image size can be done by putting the image into an `ImageIcon`, putting the `ImageIcon` into the `JPanel`, and calling `frame.pack()`, but none of those things were covered in the lecture. So, just play with the frame width and height to make the image fit.

- 5.** Draw a mustache or some other graffiti on top of Bill.