

# INTRODUCTION TO COMPUTER SCIENCE II

## LAB 1

### Drawing to the screen

Our review of Java will properly begin in class on Wednesday, but we will start our work with *nested loops* (covered in Section 4.7 of the textbook), all while learning (for the first time, for many) how to create a *graphical interface*.

## 1 Getting started

**Installing Java:** For those who have not (recently) taken COSC-111, you need to installed the *Java Development Kit (JDK)* on your own machine. To do so, do the following:

1. **Download:** Go to...

<https://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>

Under *Java SE Development Kit 8u241*, be sure to click the radio button for *Accept License Agreement*.

Depending on what kind of machine you have, you should download either **Mac OS X x64** or **Windows x64**. (If you use Linux, you should use your distribution's software management system; if you use a Chromebook, see me.)

2. **Install:** Run the installer that you download.
3. **Configure:** Update your `PATH` variable, which will make the Java commands available to you on your command line. Instructions on doing this can be found here:

<https://www.java.com/en/download/help/path.xml>

4. **Dropbox:** I strongly recommend you store your project work, as you do it, in Dropbox, for which you have a college account. If you haven't installed it, do so. Once you've installed it, put your project work in your Dropbox folder.

**Getting started with the code:** Now that you’ve got Java ready to go, let’s grab a source code file with which to work...

1. **Get the code:** Use the following link to download a source code file, saving it to your project directory as a file named `DrawToScreen.java`:

`https://bit.ly/AMHCS-2020S-112-11`

2. **Examine the code:** Go and open `DrawToScreen.java` with your favorite editor/IDE (Emacs, Sublime Text, Eclipse, IntelliJ, whatever). There are some elements of this program that may be new to you—`extends JPanel`, `JFrame`, `@Override`—but you don’t need to grapple with those just yet. They will be explained in time.
3. **Compile and run:** Make it go...

```
$ javac DrawToScreen.java
$ java DrawToScreen
```

You should see a new window open, and a few geometric shapes of different colors will appear in that window.

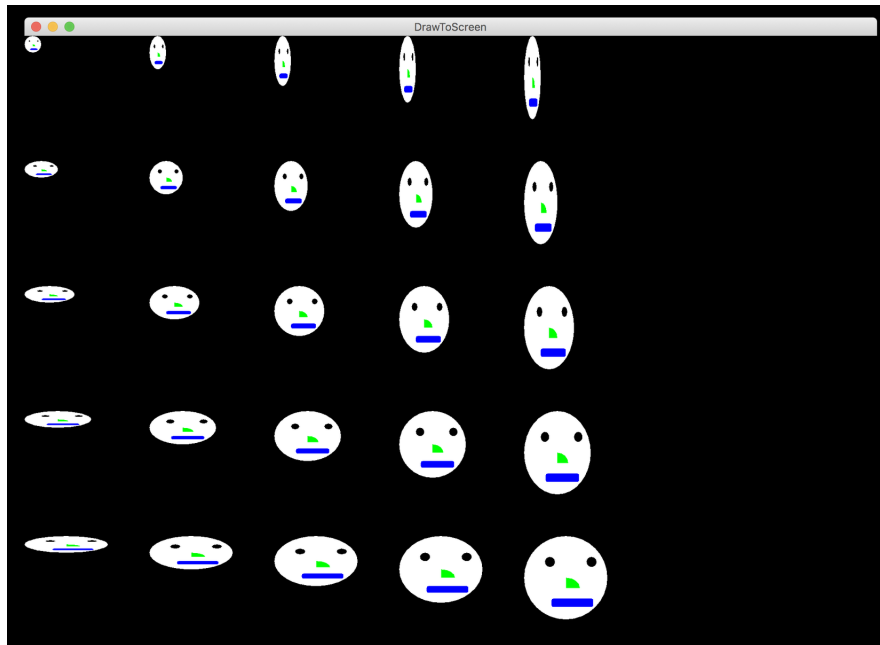
## 2 Your assignment

In this lab you will be editing the `paintComponent()` method. For documentation on how methods like `fillRect()` work, and to see what other methods are available, see the Java API documentation:

`http://docs.oracle.com/javase/8/docs/api/`

**Completing the lab:** Here’s what you must do...

1. **Draw a object of your choosing.** This can be a stick figure, a building, the face of a soulless clown from your childhood, or whatever you want, but it needs to contain at least 5 base shapes (ovals, rectangles, what have you).
2. **Draw 25 copies of your object in a 5 x 5 grid.** If you want to challenge yourself, make each copy distorted based on it’s position in the grid, as in the following figure:



**Note:** Making 25 copies in a grid naively is a painful process of busywork. If you instead define a method which draws one copy of your object, though, and remember how nested loops work, and then it's far easier.

### 3 How to submit your work

Submit your `DrawToScreen.java` file via the CS submission system:

`https://www.cs.amherst.edu/submit`

**This assignment is due on Sunday, Feb-02, 11:59 pm.**