COP5555 Fall 2013
Assignment 6

Assigned Nov 13
Due: Monday Dec 2 at 11am

Assignment 7 will be due on Monday, Dec 9 (Friday Dec 13 for EDGE students) and will not include new work, but will give you the opportunity to correct any remaining mistakes in your compiler. Assignment 7 counts double and cannot be dropped.

1. [*This question is will not be graded and does not need to be submitted, but might be on the final exam*.] Both Java and C++ have recently added a feature called lambdas (Java 8 and C++11). What are they, what are they good for, and where did the name come from?
2. Finish the implementation of code generation for your compiler as indicated in the attached document.

   Note: Java 7 introduced a new feature (which was optional in Java 6) called stack map frame which requires the class file to contain detailed type information about the contents of the local variables and stack at each branch target. If you look at the byte code for a typical java 7 class file, you will probably see FRAME instructions—which record this information. We got away without dealing with this in assignment 5 because we did not implement any part of our language that needs branching. For assignment 6, we will also ignore this feature (the project is difficult enough already) but in order for your code to pass bytecode verification without correct stack map frames, you need to

   execute your programs with the following jvm argument:

   -XX:-UseSplitVerifier

   Optional: For more information about stack frame maps and a rant about them, see http://docs.oracle.com/javase/specs/jvms/se7/jvms7.pdf section 4.7.4 and http://chrononsystems.com/blog/java-7-design-flaw-leads-to-huge-backward-step-for-the-jvm, respectively.

3. Write and submit at least two artistic and visually interesting programs in our language. These will be shared with the class. Make sure your programs are self-contained (i.e. they read images from a publicly available web site or compute them from scratch).

Submit to elearning:

One jar file called Assignment6.jar containing the source code of ALL class (including those provided by me) in your program. Do not change the classes in the `cop5555fa13.runtime` package, and make sure you are using the latest version.

Separate attachments with each program in our language.