

Assignment 3

Submission Date: 26th April 2016

In this last part of the assignment, you will generate code for MIPS. For initial ideas regarding code generation, you can read section 8.6 of the main text book. This is titled *A simple code generator*. The primary requirement of your code generator is correctness. The next requirement is completeness—all features should be implemented in a general sense. For instance, your code generator should not fail because an expression was too large and you could not find enough registers to hold intermediate values during its evaluation. Going beyond these may earn you bonus points. If you design and implement a code generator that you can argue to be more efficient, that will win you bonus points. I shall later inform you regarding the policy for awarding bonus marks.

As soon as I finish doing intermediate code generation for boolean expressions and control flow statements and do a couple of lectures on runtime environments, you will know enough to generate code for your language. The rest of the lectures will be on generation of fancier features or will focus on generating more efficient code. Please start off as soon as possible. I shall keep on adding to the assignment description as usual.

A tool that will allow you to experiment on code-generation is a cross compiler for MIPS. A compiler usually generates code for the host machine. For example, if your laptop has a 64-bit intel machine (its instruction set is called x86-64), both the gcc compiler executable itself and the compiled code would be x86-64, since both are expected to run on the host machine. However, for your lab, you need a compiler that runs on your laptop and produces code for MIPS. This is for you to experiment on and get a good idea of the code that would be typically produced by a MIPS compiler.

Installing a mips compiler for Ubuntu is easy. <http://stackoverflow.com/questions/17006843/compile-c-for-mips-architecture> lists the steps and it works without problems. Also install qtspim from: <https://sourceforge.net/projects/spimsimulator/files/>. And finally, download the documentation on qtspim from <http://www.egr.unlv.edu/~ed/MIPStextSMv11.pdf>. You are now ready to write the code generator.