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CS 461
PA 4: CSEM

Project Report

For Programming assignment 4, we were tasked to write a program called csem which reads a C program from standard input and compiles it into LLVM intermediate representation. The intermediate representation is then printed to standard output. For the programming assignment we were only asked to be able to compile a subset of the C language into LLVM representation. Our assignment was to write the semantic actions for the csem program to produce the appropriate LLVM IR. I started writing the program by watching the lecture from class about programming assignment 4. In the lecture, Dr. Jantz goes over how to implement backpatch and other functions. After watching the lecture, I started by decomposing what each function is supposed to do. I also read the documentation on <https://llvm.org> about the different data structures used for LLVM representation. Such data structures include BasicBlocks and BranchInst. I also used the cheat sheet that was provided in the lab starter directory to learn about what different LLVM functions did. Finally I used the comments provided by Dr. Jantz to guide me towards the solution. To debug, I used the ref_csem program that was provided in the lab starter directory which I used to model my program's outputs. I also used printf statements to keep track of where my output was differing from the output produced by the ref_csem program. I was able to successfully complete all functions in the lab except the goto and labeldcl functions. I believe if I had more time to work on the lab, I would be able to complete these functions as well. Other than that, I believe I succeeded in completing this lab.