

CS270 Recitation 14

“Help Session for LC-3 Assembler”

Goals

To help students with the LC-3 assembler assignment, or more specifically:

1. To explain the LC-3 assembler assignment in more detail and answer any questions you might have.
2. To provide some hints about various algorithmic and coding issues, without giving you the code.

Due to limitations on time and resource, this recitation is not intended as a help session to debug your C code!

Help Topics

- 1) The teaching assistant will show how to run `lc3convert` on a `.hex` file to create an object file, and will show the format for the `.hex`, `.obj`, and `.sym` files.
- 2) The teaching assistant will discuss how the machine code (hex value) for an instruction can be generated, and will work through the example `ADD R1, R2, #-5`.
- 3) The teaching assistant will describe how to correctly evaluate an immediate value to make sure it fits into the number of bits allocated for it in the instruction, and how to store it in a 32-bit number, and combine it back into the immediate field.
- 4) The teaching assistant will describe how to find PC offsets from the delta between the address of the current instruction and the label it references, e.g. `LD R0, MYDATA`, taking into account the increment of the PC during decode.
- 5) The teaching assistant will describe how to handle the assembly opcodes `.FILL` and `.BLKW` in order to correctly generate machine code for these instructions.