Project 3 Quick Start Guide

1. Start a new Logisim project. Save it.
2. To build the PC
   a) Add a register. This will be the PC.
      - **Think:** How many bits should it be?
   b) Add a clock component and an adder.
   c) Add a constant.
      - **Think:** What should the constant's value be? 1? 2? 4?
   d) Increment the PC by the appropriate amount with the adder.
3. To build a basic datapath
   a) Expand your lab 10's register file to 8 registers.
   b) Build an ALU subcircuit that has two inputs and a single output
      - **Think:** How many bits wide should the ALU's inputs be? Its output?
   c) Connect the ALU's output to the write data input of the register file.
   d) Hardcode (use constants) some control signals, such as "registerWrite" so that the ALU writes to the register file after reading from the register file.
4. You are now ready to work on the instruction memory, decoder, and constructing a more-capable datapath.

Quick Debugging Tips

- To test a subcircuit, independent of how it is connected to the main circuit
  - Double click its name from the listing of subcircuits on the top left side of screen
- To view how an instantiated subcircuit behaves (i.e., what it is doing with the inputs it gets from the main circuit)
  - Double click the instantiated circuit using the poke (hand) tool
- Add pins of the appropriate type/bit-width to examine values travelling between components. For example: