Logisim Convention Guide

We are now exclusively using Logisim for building circuits. If you've never used the program we used to use, Diglog, we promise you that this is a reason to rejoice. However, we have some guidelines we would like you to keep in mind when working in Logisim. Ignore these rules at your own peril, as deviations from them will result in loss of points.

- Logisim provides all sorts of fun and exciting building blocks, some of which can make your life a lot easier. However, your mean-spirited TAs don't necessarily want your lives to be that easy. Therefore, unless an assignment says otherwise, here is the list of the ONLY items you are allowed to use:

    - Wires
    - All normal boolean gates (e.g. AND, XOR, etc)
    - Constants
    - Pins
    - Clocks
    - Controlled buffers (i.e. tri-states)
    - Multiplexers
    - Decoders
    - Adder (note that this is the ONLY item from the Arithmetic section you may use)
    - J-K Flip-Flops
    - Registers
    - RAM
    - ROM
    - Hex digit displays
    - Splitters

    Note that this list does not include Demultiplexers or Negators! You may not use these, or any other component not listed above.

- Red wires signify an error in your circuit (and may only appear for certain inputs, so test thoroughly!). You should never submit a circuit that has red wires at any time - if you do, you will lose points!

- Your input and output should always be done with the pin component (with the Output attribute correctly set – please don't use the LED piece for output). Additionally, your inputs should never have the Three-state attribute set to yes.

- You should always label all of your circuit's input and output pins. The ideal way to do this is to click on the pin and put the name in the"Label" field in the menu on the left-side bar (as opposed to placing a separate label next to the pin). You should also always label all busses. In addition, you should label anything else you think would help us better understand your circuit.

- You should never gate the clock. Although it will probably not cause any problems if you do it in Logisim, in real physical circuits it is a bad idea as the gate delays the clock signal slightly, which can disrupt the timing and coordination of the circuit. Similarly, you shouldn't send the clock signal through a tri-state.

- Tri-states should only be used to control which signal is placed onto a bus. You should never feed high impedence into any kind of gate or subcircuit (such as the input of a register or RAM whose write-signal is enabled). For example, using tri-states to make the input to a register high-impedence while the write-signal is enabled is undefined behavior and should be avoided. Logisim may be nice to you and make everything seem like it is working, but we will take points off for this behavior.

- Logisim allows you to bundle wires using splitters, so that one wire in Logisim can carry multiple bits. This is fine for you to use. However, when using a splitter to split a wire with multiple bits on it into multiple wires which themselves carry more than one bit (e.g. when splitting an 8-bit wire into a 3-bit and a 5-bit wire), please label the number of bits on the outgoing wires.

- Logisim allows you to create sub-circuits by building saving a circuit and them importing it as a single piece into another circuit. Please do not use this feature. None of the circuits we ask you to build should be large enough to require using sub-circuits, and it makes your circuit much harder to grade, which makes the TAs unhappy, which is something you don't want.