EECS 3201 :: Lab 5
Simulation with ModelSim

Overview

In this lab you will:

- Write testbench modules to test circuits in ModelSim; and
- Create a video illustrating your results.

Value: This lab is worth 4/20 of your total lab score.

Note about ModelSim

If you are using Ubuntu, or another Linux distribution, you might find that you can't launch ModelSim. This could be because ModelSim relies on 32-bit libraries which are not installed with 64-bit Linux distributions by default. There are various instructions for getting ModelSim to work, for example:

https://mil.ufl.edu/3701/docs/quartus/linux/ModelSim_linux.pdf

If this doesn't work for you, try Googling for similar instructions.

Testbenches

Download modules test1.v and test2.v from eClass. The first file, test1.v, is a combinatorial circuit with three inputs and two outputs; the second file, test2.v, is a sequential circuit with two inputs (one of which is the clock), and a four-bit bus output.

Write testbench modules as follows:

- For test1.v, write a testbench that tests all 8 possible input values, and holds each of these input values for 20 nanoseconds. If (and only if) both outputs are zero, the testbench should write the message "All outputs are zero" to the simulation console on the transition to this condition. Save the testbench in: test1_tb.v
- For test2.v, generate a clock with a 20 nanosecond period (10 ns on and 10 ns off) and provide it to the circuit. The other input should be 0 for the first 100 ns, 1 for the next 200 ns, and 0 for all time afterward. If (and only if) all outputs are zero, the testbench should write the message "All outputs are zero" to the simulation console on the transition to this condition. Save the testbench in: test2_tb.v

Deliverables

Submit a video demonstration as well as your testbench code.

Your video should include you stating your name and student number, followed by (without breaks/cuts) a short demonstration of your simulations. To generate your video, you can either use a camera or a screen recorder, as long as it is legible.

Scoring

The lab is scored out of 5: 2 points for your video, and 3 technical points.

Video: 0/2 if missing, 1/2 if it does not conform to the specification, 2/2 if correct.

Technical points: 0/3 if code is missing, 1/3 if it does not conform to the specification, 3/3 if correct.