Timed Lab 1

CS 2110

Due Date and Time

Day: Wednesday, February 7th

Time: Before the end of your assigned lab section

Policy

Submission

TURN IN THIS ASSIGNMENT ELECTRONICALLY USING T-Square. SUBMISSIONS WHICH ARE LATE WILL NOT BE ACCEPTED . EMAIL SUBMISSIONS WILL NOT BE ACCEPTED UNDER ANY CIRCUMSTANCES! IN ADDITION IF YOU FORGET TO HIT THE SUBMIT BUTTON YOU WILL GET A ZERO.

Questions

If you are unsure of what questions mean, the TA's will clarify them to the best of their ability. We will not be able to answer any questions about how to reach a solution to the timed lab questions. You should know how by now!

What's Allowed

- The assignment files
- Your previous homeworks and lab submissions
- Your mind
- Blank paper for scratch work

What's Not Allowed

- The Internet (except the T-square Assignment page to submit)
- Any resource on T-square that is not given in the assignment.
- Textbook or notes on paper or saved on your computer.
- Dropbox (If your hard drive crashes we will let you retake it).
- Email/IM
- Contact in any form with any other person besides TAs

If you have any questions on what you may not use then assume you can't use it and ask a TA.

Other Restrictions

1. You may not leave the classroom until we have verified that you have submitted the lab. If you leave the classroom without submitting you will receive a zero.
2. **YOU MUST SUBMIT BY THE END OF YOUR LAB PERIOD** . Bear in mind that the clock on your computer may be a few minutes slow. You are supposed to have a full class period to work, and we are letting you use the 10 minutes between classes to make sure you have submitted your work. **WE WILL NOT ACCEPT LATE SUBMISSIONS** , be they 1 second or 1 hour late.
3. The timed lab has been configured to accept one submission. If you accidentally submit or submit the wrong version alert one of the TAs immediately and we will reopen submission for you.

Violations

Failure to follow these rules will be in violation of the Georgia Tech Honor Code. **AND YOU WILL RECEIVE A ZERO** and you will be reported to Bill and the Office of Student Integrity. We take cheating and using of unauthorized resources **VERY SERIOUSLY** and you will be in serious trouble if you are caught.

Remember

1. There is partial credit given, and some of it is just following the directions.

2. We allow you to use your homework assignment.

3. Please don't get stressed out during a timed lab. You have plenty of time; however, use your time effectively

4. Again, remember: Don't get stressed. Partial credit will be given for things you have done correctly. Do the best you can!

5. If you don't know something at least **TRY.** Do not just walk out of the lab or submit an empty file. Partial credit!

6. Remember what you can and can't use. If you don't know, then don't use it and ask a TA

if you can use it. If we catch you with unauthorized resources we will give you a zero, so

better to be safe than sorry.

The Assignment

For this assignment, you will be building an ALU. This ALU will take in two 8-bit **unsigned** inputs and one 2-bit selector. It will output one 8-bit output. (Note: for your inputs, you must use 8-bit inputs, not 8 separate 1-bit inputs).

When building this ALU, you may only use basic gates (AND, OR, NAND, NOR, NOT), decoders, multiplexers, adders, splitters, wires, tunnels, constants, input pins, and output pins.

Some operations have additional banned gates listed in their descriptions.

The following operations should be output by the ALU when the corresponding opcode is loaded on the selector wires.

opcode	Operation	Description
00	Doubling and Subtraction 2A – B = Y	Compute A*2 – B and output the difference. Do not worry about overflow or underflow.
01	Multiplication 6 * B = Y	Compute 6 * B and output the product. Do not worry about overflow. **You may use at most <u>one</u> 8-bit adder**
10	Multiple of 4	Compute whether A is a multiple of 4. Output 00000001 if A is a multiple of 4 and 00000000 if it is not.
11	XNOR !(A ^ B)	Compute A XNOR B and output the result. **You may only use the gates permitted in the description (No XOR, or XNOR gates)**

Make sure each operation corresponds to the correct opcode!

You may use subcircuits you have already created and you may create additional subcircuits as needed

HINT

You may reuse anything you have built on a previous Lab or Homework assignment. If you don't have the Labs and/or Homeworks downloaded on your computer, you may download them from Canvas.

CHECKING YOURSELF

We have provided you a program tester. You may run it using the command:

    java -jar TL1-grader-tests-1.0.jar

*Standard disclaimer this is not a grader and your grade may be different than the results of the tester

Deliverables

1) TL1.sim

You may submit only the file listed above to gradescope. We will not accept any internet links. We want the files above and only these files!

Check over your submission after you submit it. If you submit the wrong file and leave the lab I will not be happy and we will grade what you submit so please check over what you submitted after you submit it!

Good luck!