CprE 381: Computer Organization and Assembly-Level Programming, Spring 2019

Project Part 1 Report

Lab Partners _____

_____

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Section/Lab Time _____

Refer to the highlighted language in the project 1 instruction for the context of the following questions.

a. [Part 0] With your project group members, create a list of best practices / tips for designing, compiling, and testing VHDL modules based on your experiences so far with these labs, both working individually and as a group.

b. [Part 1 (a)] Describe the difference between logical (srl) and arithmetic (sra) shifts. Why does MIPS not have a sla instruction?

c. [Part 1 (b)] In your writeup, briefly describe how your VHDL code implements both the arithmetic and logical shifting operations.

d. [Part 1 (c)] In your writeup, explain how the right barrel shifter from part b) can be enhanced to also support left shifting operations.

e. [Part 1 (d)] Describe how the execution of the different shifting operations corresponds to the Modelsim waveforms in your writeup. Waveforms.

f. [Part 2 (a)] Draw a simplified schematic for this 32-bit ALU. Consider the following questions: how is Overflow calculated? How is Zero calculated? How is slt implemented?

g. [Part 2 (c)] Describe how the execution of the different operations corresponds to the Modelsim waveforms in your writeup .Waveforms.

h. [Part 3(b)] justify why your test plan is comprehensive. Include waveforms that demonstrate your test programs functioning.

i. [Feedback] You must complete this section for your lab to be graded. This will be turned in INDIVIDUALLY in a separate assignment called "Proj 1 Feedback". Write down the first response you think of; I expect it to take roughly 5 minutes (do not take more than 10 minutes).

1. How many hours did you spend on this lab?

Task	During lab time	Outside of lab time
Reading lab		
Pencil/paper design		
VHDL design		
Assembly coding		
Simulation		
Debugging		

Report writing		
Other:		
Total		

2. What fraction of the above time did you spend working with your partner (either in a lab or remotely)?

3. If you could change one thing about the lab experience, what would it be? Why?

4. What was the most interesting part of the lab?