CSE 331 – COMPUTER ORGANIZATION

HW-2 REPORT

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PART 2 – ALU

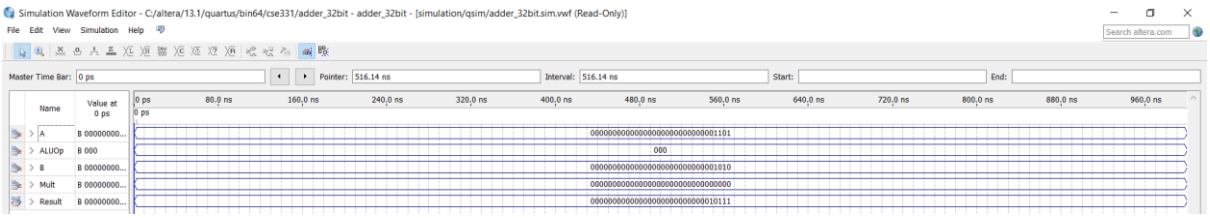
1) 32-Bit Adder

⇨ Inputs: A [32], B [32], Carry_In

⇨ Outputs: Sum[32], Carry_Out, Carry_Overflow

Inside the adder I used FA and HA just like on the lesson.

This is the test of the adder:



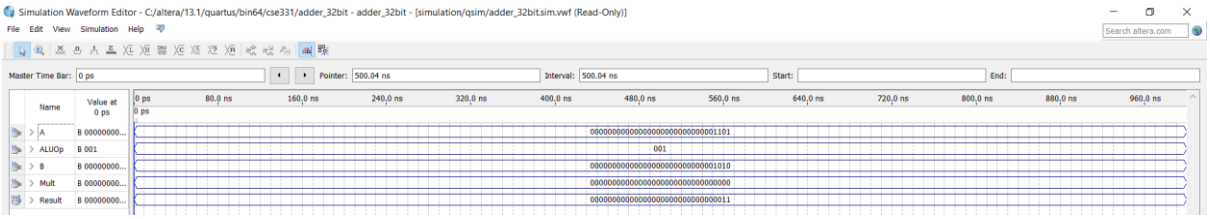
2) 32-Bit Subs

⇨ Inputs: A [32], B [32], Carry_In

⇨ Outputs: Sum[32], Carry_Out, Carry_Overflow

I used the one adder for subs, add, slt so inputs are same of the alls.

This is the test of the subs:



3) 32-Bit Mult

⇨ I can not do this part.

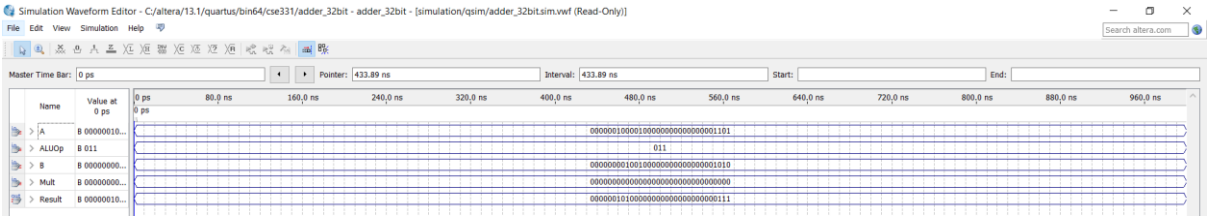
4) 32-Bit XOR

⇨ Inputs: A [32], B [32]

⇨ Outputs: Out[32]

I XOR ed all bits one by one.

This is the test of the XOR :



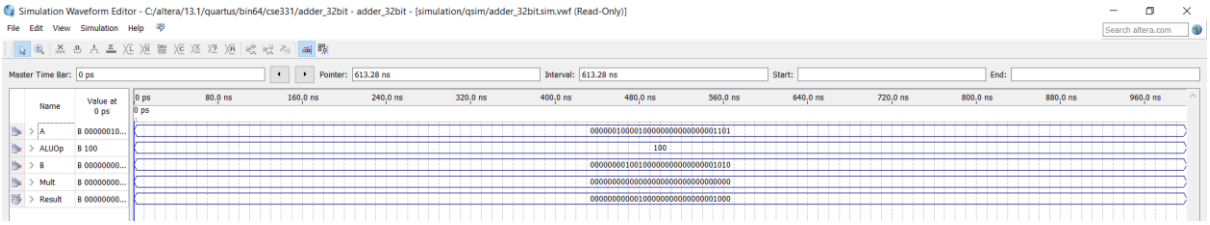
5) 32-Bit AND

⇨ Inputs: A [32], B [32]

⇨ Outputs: Out[32]

I AND ed all bits one by one.

This is the test of the AND :



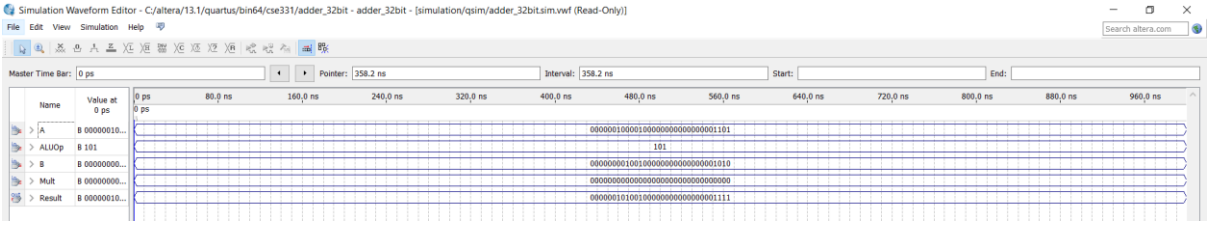
6) 32-Bit OR

⇨ Inputs: A [32], B [32]

⇨ Outputs: Out[32]

I OR ed all bits one by one.

This is the test of the OR :



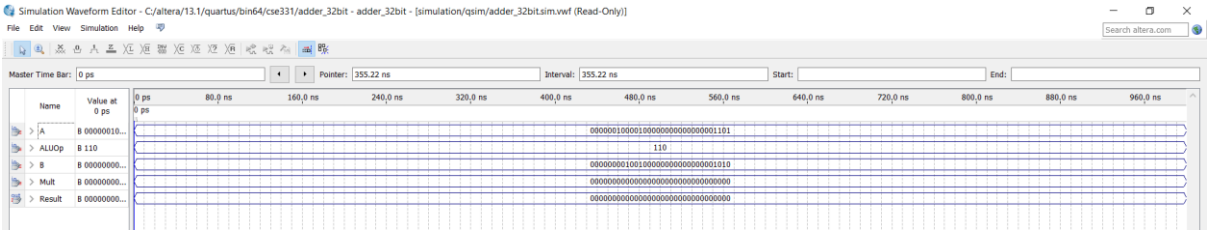
7) 32-Bit SLT

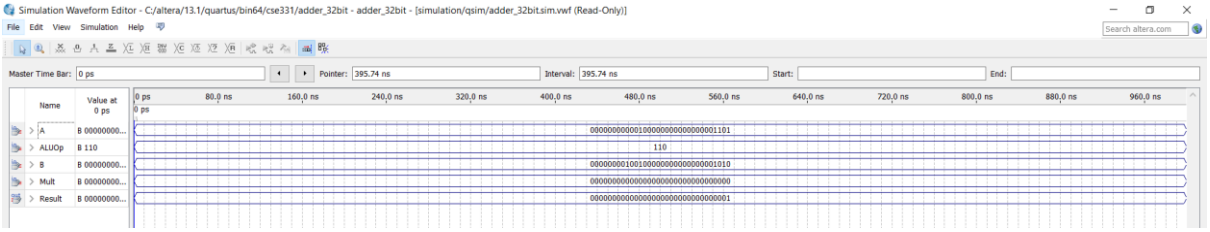
⇨ Inputs: A [32], B [32], Carry_In

⇨ Outputs: Sum[32], Carry_Out, Carry_Overflow

I used the one adder for subs, add, slt so inputs are same of the alls.

This is the test of the SLT :





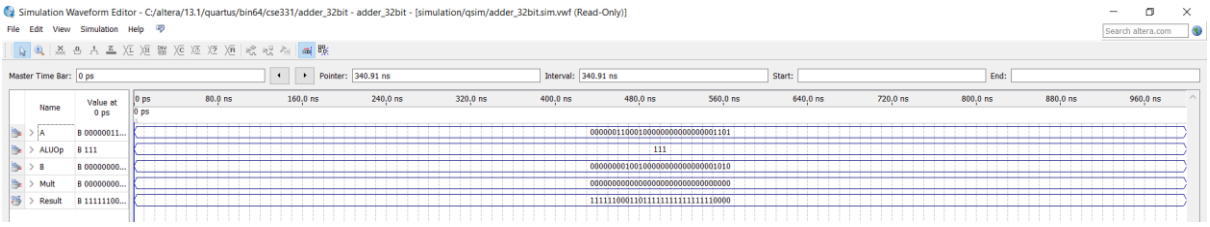
8) 32-Bit NOR

⇨ Inputs: A [32], B [32]

⇨ Outputs: Out[32]

I NOR ed all bits one by one.

This is the test of the NOR :



9) 32-Bit 8x1 MUX

⇨ Inputs: In0 [32], In1 [32] , In2 [32] , In3 [32] , In4 [32] , In5 [32] ,
⇨ In6 [32], In7 [32]
⇨ Outputs: Out[32]

I make 1-Bit 2x1 MUX for => Sum = (In0 & ~S) + (In1 & S)

Then I make 32-Bit 2x1 MUX for using 1-Bit 2x1 MUX 32 times.

Then I make 32-Bit 8x1 MUX for using 32-Bit 2x1 MUX 7 times.

PART 1 – MULT

In here I try to make controller and datapath like PS's. I am not sure these are true or false. Because I can not do mult32.v file so I can not try to test cases.

But I am believe that my datapath and controller are true. And of course I do the adder.v for ALU and in according to my design mult, add, sub and slt is working same adder.

NOTE: I created the testbench for each .v file but I can not use because I can not understand how these are using. So I try to enter values my hand one by one and then I screenshot each of them.