

CSE231 HW2 - REPORT

`mux_module.v` :

- mux_module (out, a, b, c, d, s0, s1)

- Find the output for 4*1 mux .

`for_xor.v` :

- for_xor (out, a, b)

- Find the output for XOR operation.

`one_bit.v` :

- one_bit (r_i, c_i_plus, a, b, c, alu_op_2, less, alu_op_0, alu_op_1)

- Find the output for one bit operation.

`twenty_two_bit.v` :

- thirty_two_bit (r_i, c_i_plus, a, b, c, alu_op_2, less, alu_op_0, alu_op_1)

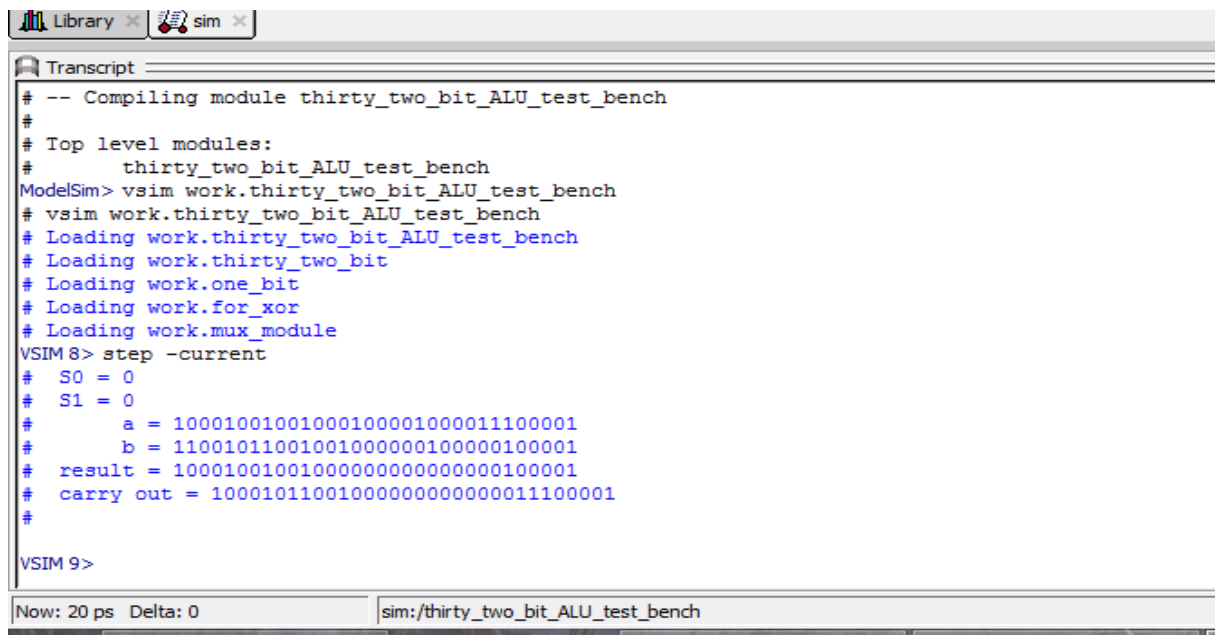
- Find the output for twenty two bit operation.

`twenty_two_bit_ALU_test_bench.v` :

- This header same the main.

- This function do input operation and give the result.

-AND First Example

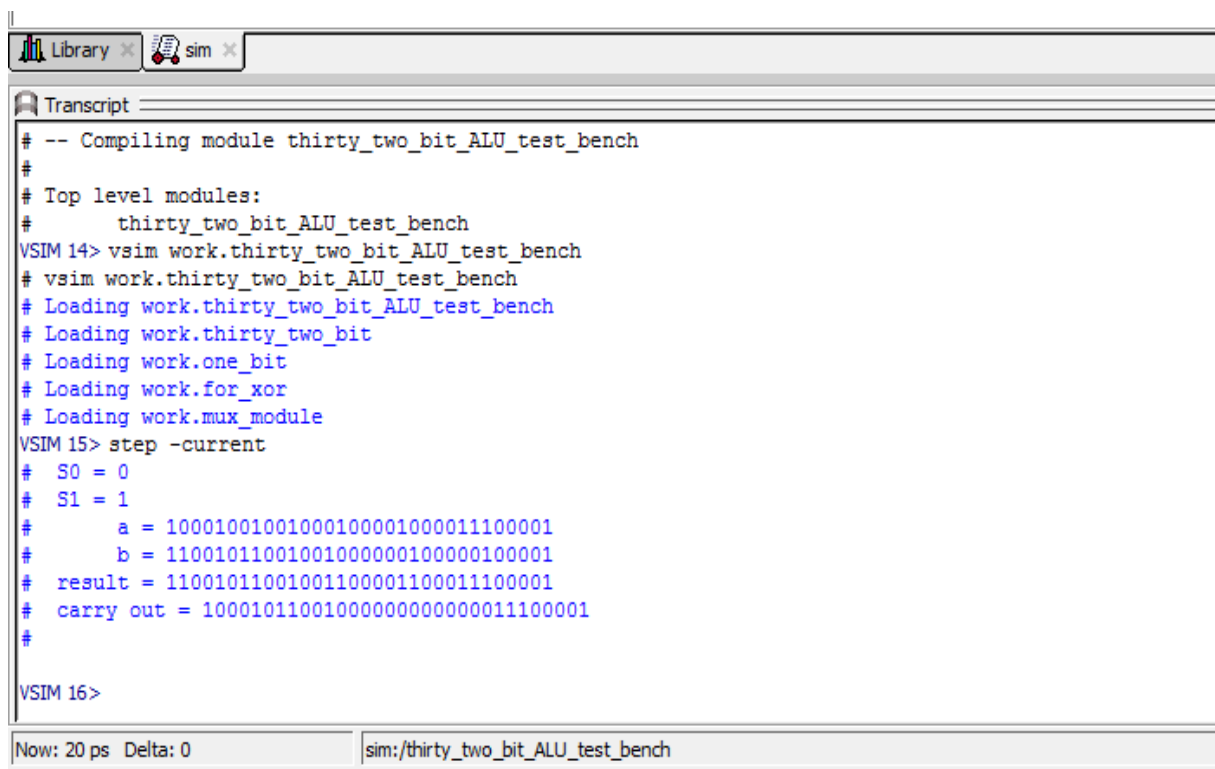


The screenshot shows the ModelSim interface with the 'Library' and 'sim' tabs. The 'Transcript' window displays the following text:

```
# -- Compiling module thirty_two_bit_ALU_test_bench
#
# Top level modules:
#   thirty_two_bit_ALU_test_bench
ModelSim> vsim work.thirty_two_bit_ALU_test_bench
# vsim work.thirty_two_bit_ALU_test_bench
# Loading work.thirty_two_bit_ALU_test_bench
# Loading work.thirty_two_bit
# Loading work.one_bit
# Loading work.for_xor
# Loading work.mux_module
VSIM 8> step -current
# S0 = 0
# S1 = 0
#   a = 10001001001000100001000011100001
#   b = 11001011001001000000100000100001
# result = 1000100100100000000000000100001
# carry out = 10001011001000000000000011100001
#
VSIM 9>
```

The status bar at the bottom indicates 'Now: 20 ps Delta: 0' and 'sim:/thirty_two_bit_ALU_test_bench'.

-OR First Example



The screenshot shows the ModelSim interface with the 'Library' and 'sim' tabs. The 'Transcript' window displays the following text:

```
# -- Compiling module thirty_two_bit_ALU_test_bench
#
# Top level modules:
#   thirty_two_bit_ALU_test_bench
VSIM 14> vsim work.thirty_two_bit_ALU_test_bench
# vsim work.thirty_two_bit_ALU_test_bench
# Loading work.thirty_two_bit_ALU_test_bench
# Loading work.thirty_two_bit
# Loading work.one_bit
# Loading work.for_xor
# Loading work.mux_module
VSIM 15> step -current
# S0 = 0
# S1 = 1
#   a = 10001001001000100001000011100001
#   b = 11001011001001000000100000100001
# result = 110010110010011000011000011100001
# carry out = 10001011001000000000000011100001
#
VSIM 16>
```

The status bar at the bottom indicates 'Now: 20 ps Delta: 0' and 'sim:/thirty_two_bit_ALU_test_bench'.

-ADD First Example (not overflow)

[illegible]

-ADD Second Example With OVERFLOW

```
# Transcript
```

```
# -- Compiling module thirty_two_bit_ALU_test_bench  
#  
# Top level modules:  
#     thirty_two_bit_ALU_test_bench  
VSIM 49> vsim work.thirty_two_bit_ALU_test_bench  
# vsim work.thirty_two_bit_ALU_test_bench  
# Loading work.thirty_two_bit_ALU_test_bench  
# Loading work.thirty_two_bit  
# Loading work.one_bit  
# Loading work.for_xor  
# Loading work.mux_module  
VSIM 50> step -current  
# S0 = 1  
# S1 = 0  
#      a = 110000000000000000000000000001001  
#      b = 110000000000000000000000000000101  
# result = 100000000000000000000000000001110  
# carry out = 11000000000000000000000000000001  
#  
VSIM 51>
```

```
Now: 20 ps Delta: 0 sim:/thirty_two_bit_ALU_test_bench
```

-SUBTRACT For Pozitive Answer

[illegible]

-SUBTRACT For Negative Answer

```
# -- Compiling module thirty_two_bit_ALU_test_bench
#
# Top level modules:
#     thirty_two_bit_ALU_test_bench
VSIM 63> vsim work.thirty_two_bit_ALU_test_bench
# vsim work.thirty_two_bit_ALU_test_bench
# Loading work.thirty_two_bit_ALU_test_bench
# Loading work.thirty_two_bit
# Loading work.one_bit
# Loading work.for_xor
# Loading work.mux_module
VSIM 64> step -current
# S0 = 1
# S1 = 0
#      a = 0000000000000000000000000000000101
#      b = 0000000000000000000000000000000101
# result = 1111111111111111111111111111111100
# carry out = 00000000000000000000000000000011
#
VSIM 65>
```

Now: 20 ps Delta: 0

sim:/thirty_two_bit_ALU_test_bench

The screenshot shows the VSIM software interface. At the top are two tabs labeled "Library" and "sim". Below them is a section titled "Transcript" which contains a log of commands and their outputs. The commands include compiling a module, listing top-level modules, running a vsim command, loading various work files, stepping through the current state, and displaying variable values like S0, S1, a, b, result, and carry out. The bottom status bar indicates the current time is 20 ps, Delta is 0, and the active file path is sim:/thirty_two_bit_ALU_test_bench.

Library × sim ×

Transcript

```
# -- Compiling module thirty_two_bit_ALU_test_bench  
#  
# Top level modules:  
#   thirty_two_bit_ALU_test_bench  
VSIM 98> vsim work.thirty_two_bit_ALU_test_bench  
# vsim work.thirty_two_bit_ALU_test_bench  
# Loading work.thirty_two_bit_ALU_test_bench  
# Loading work.thirty_two_bit  
# Loading work.one_bit  
# Loading work.for_xor  
# Loading work.mux_module  
VSIM 99> step -current  
# S0 = 1  
# S1 = 1  
#    a = 00000000000000000000000000000000101  
#    b = 000000000000000000000000000000001101  
#    result = 11111111111111111111111111111111000  
#    carry_out = 00000000000000000000000000000000111  
#  
VSIM 100>
```

Now: 20 ps Delta: 0 sim:/thirty_two_bit_ALU_test_bench

[illegible]

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