

2a.

Transcript

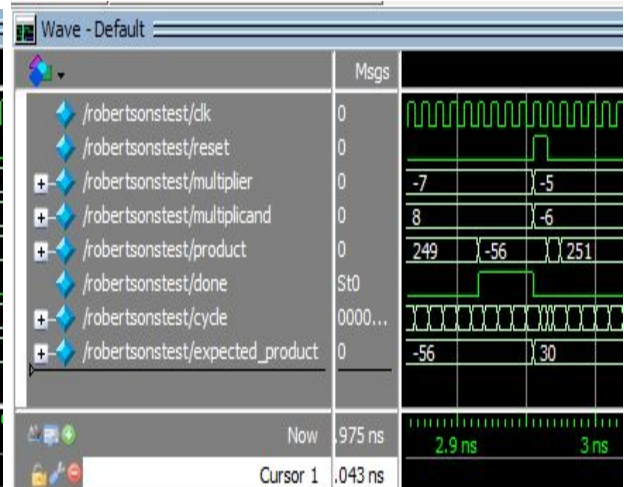
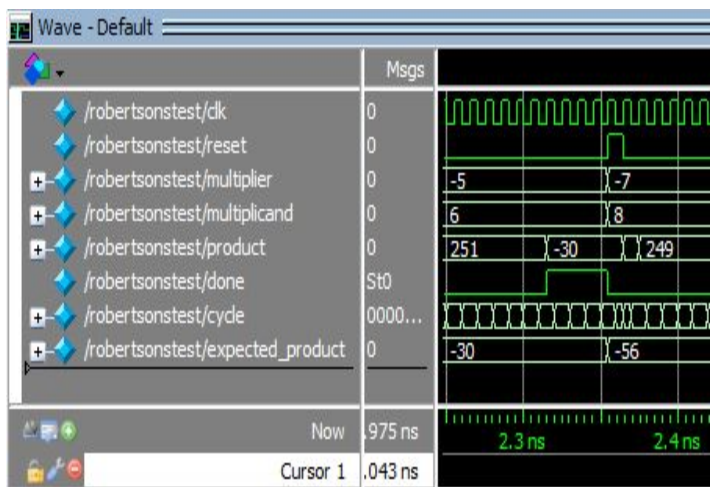
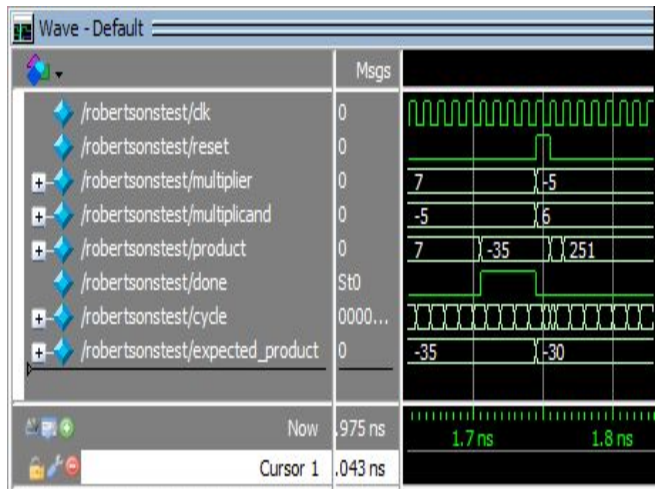
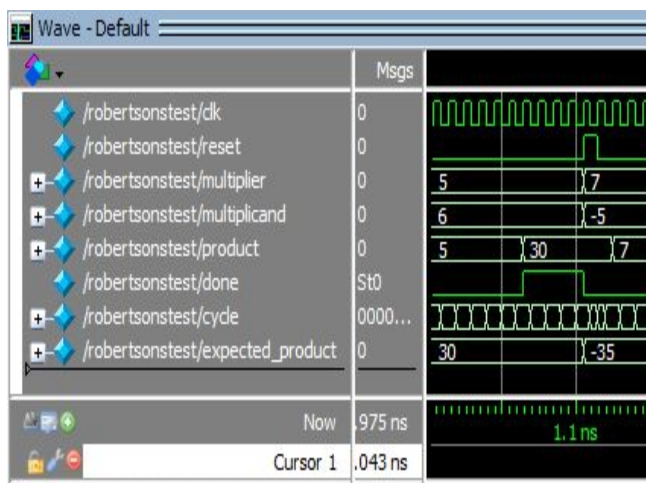
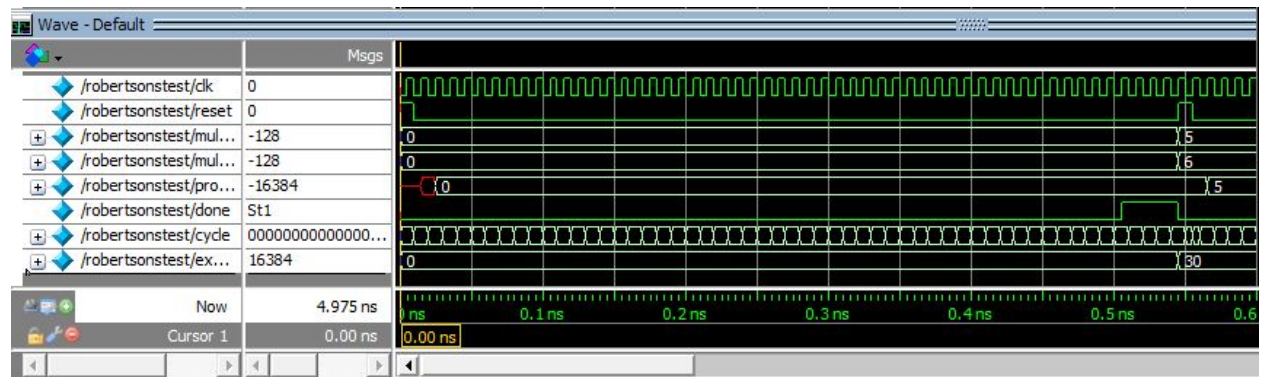
File Edit View Bookmarks Window Help

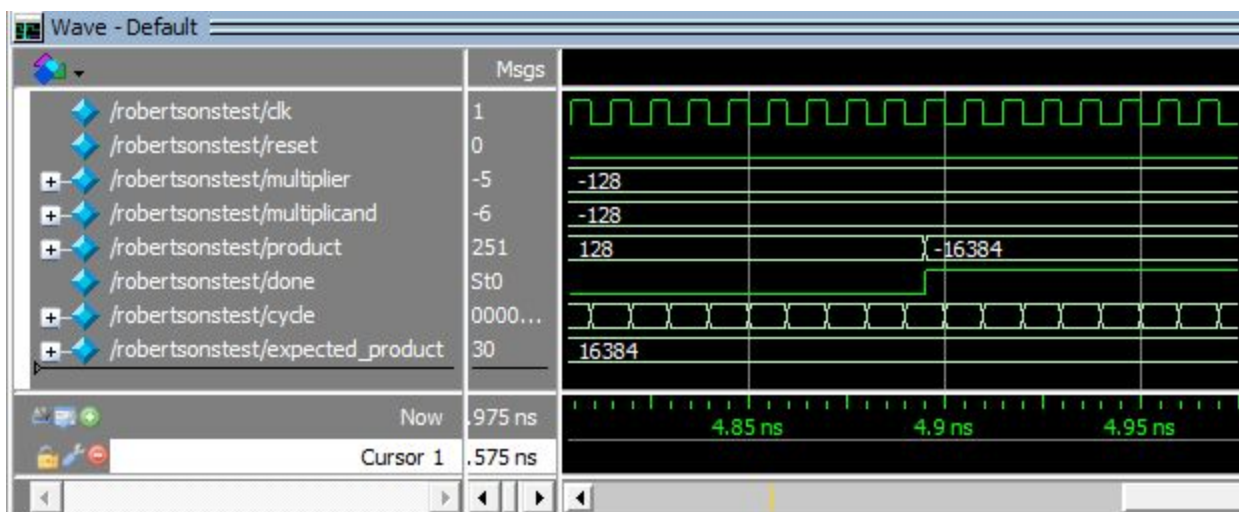
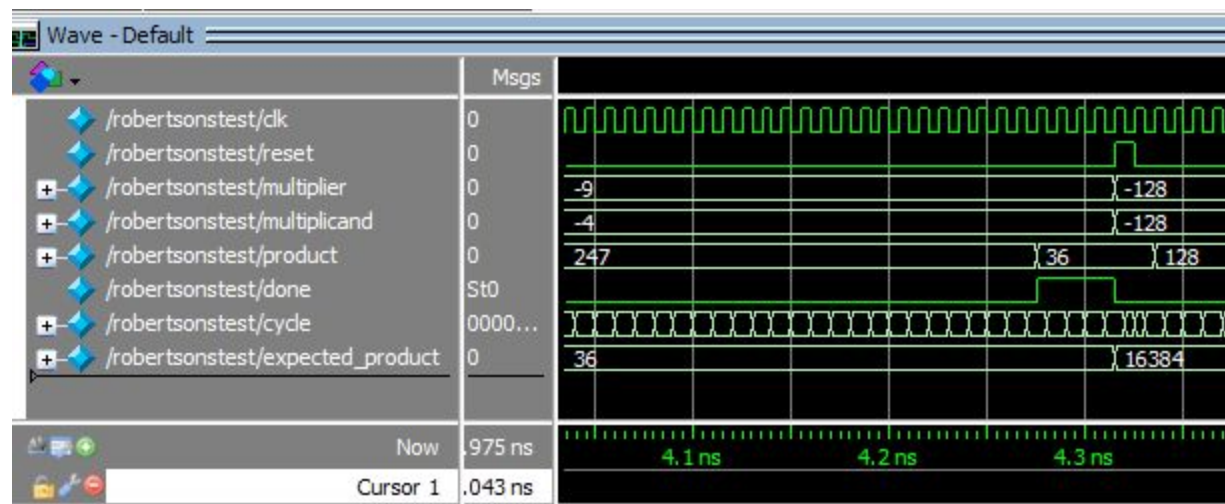
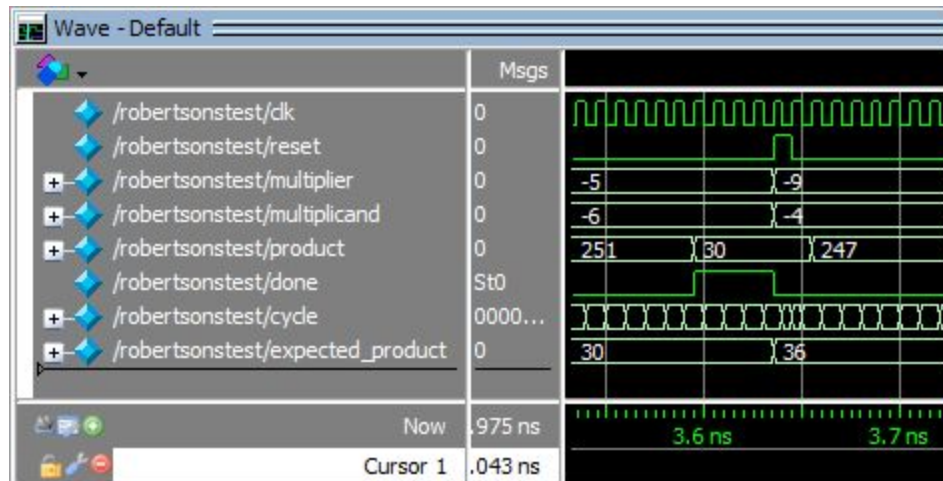
Transcript

```
# Start time: 12:13:08 on Apr 27, 2020
# vlog -reportprogress 300 -work work C:/Users/Christian/Desktop/Lab1 Files/signed_mult.sv
# -- Compiling module signed_mult
#
# Top level modules:
#   signed_mult
# End time: 12:13:08 on Apr 27, 2020, Elapsed time: 0:00:00
# Errors: 0, Warnings: 0
vlog -reportprogress 300 -work work {C:/Users/Christian/Desktop/Lab1 Files/toprobertsons.sv}
# Model Technology ModelSim - Intel FPGA Edition vlog 10.5b Compiler 2016.10 Oct 5 2016
# Start time: 12:13:08 on Apr 27, 2020
# vlog -reportprogress 300 -work work C:/Users/Christian/Desktop/Lab1 Files/toprobertsons.sv
# -- Compiling module toprobertsons
#
# Top level modules:
#   toprobertsons
# End time: 12:13:08 on Apr 27, 2020, Elapsed time: 0:00:00
# Errors: 0, Warnings: 0
vlog -reportprogress 300 -work work {C:/Users/Christian/Desktop/Lab1 Files/upc_reg.sv}
# Model Technology ModelSim - Intel FPGA Edition vlog 10.5b Compiler 2016.10 Oct 5 2016
# Start time: 12:13:08 on Apr 27, 2020
# vlog -reportprogress 300 -work work C:/Users/Christian/Desktop/Lab1 Files/upc_reg.sv
# -- Compiling module upc_reg
#
# Top level modules:
#   upc_reg
# End time: 12:13:08 on Apr 27, 2020, Elapsed time: 0:00:00
# Errors: 0, Warnings: 0
ModelSim> vsim work.robertsonstest
# vsim work.robertsonstest
# Start time: 12:13:12 on Apr 27, 2020
# Loading sv_std.std
# Loading work.robertsonstest
# Loading work.toprobertsons
# Loading work.robsmult
# Loading work.robs_control_unit_micro
# Loading work.upc_reg
# Loading work.mux5
# Loading work.rom
# Loading work.robs_datapath
# Loading work.register
# Loading work.register_hl
# Loading work.right_shift_register
# Loading work.mux2
# Loading work.mux3
# Loading work.addsub
# Loading work.counter_down
add wave sim:/robertsonstest/*
VSIM 21> run -all
# Simulation succeeded 0x0000 = 0 = 0x0000 = 0x00 * 0x00
# Simulation succeeded 0x001e = 30 = 0x001e = 0x05 * 0x06
# Simulation succeeded 0xffdd = -35 = 0xffdd = 0x07 * 0xfb
# Simulation succeeded 0xffe2 = -30 = 0xffe2 = 0xfb * 0x06
# Simulation succeeded 0xffc8 = -56 = 0xffc8 = 0xf9 * 0x08
# Simulation succeeded 0x001e = 30 = 0x001e = 0xfb * 0xfa
# Simulation succeeded 0x0024 = 36 = 0x0024 = 0xf7 * 0xfc
# Simulation failed c000 != 4000 = 80 * 80
# ** Note: $stop : C:/Users/Christian/Desktop/Lab1 Files/robertsonstest.sv(95)
# Time: 4975 ps Iteration: 0 Instance: /robertsonstest
# Break in Module robertsonstest at C:/Users/Christian/Desktop/Lab1 Files/robertsonstest.sv line 95
VSIM 22>]
```

2b. There were no Errors or Warnings

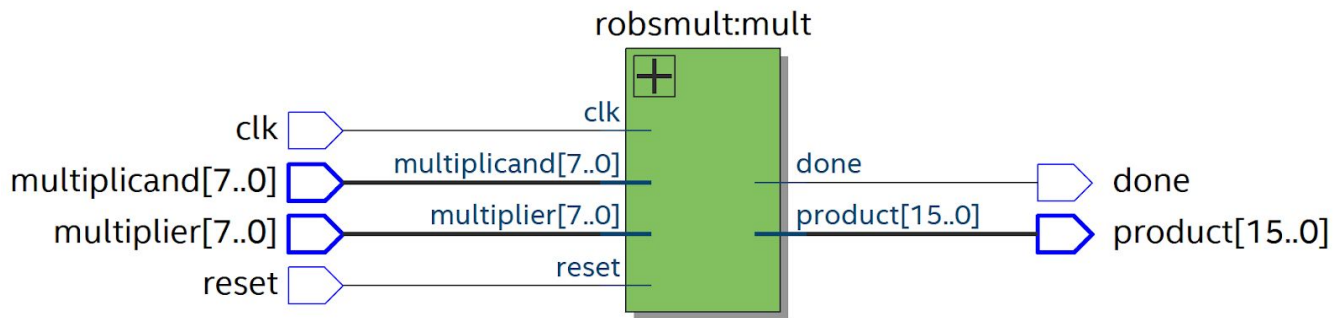
3.



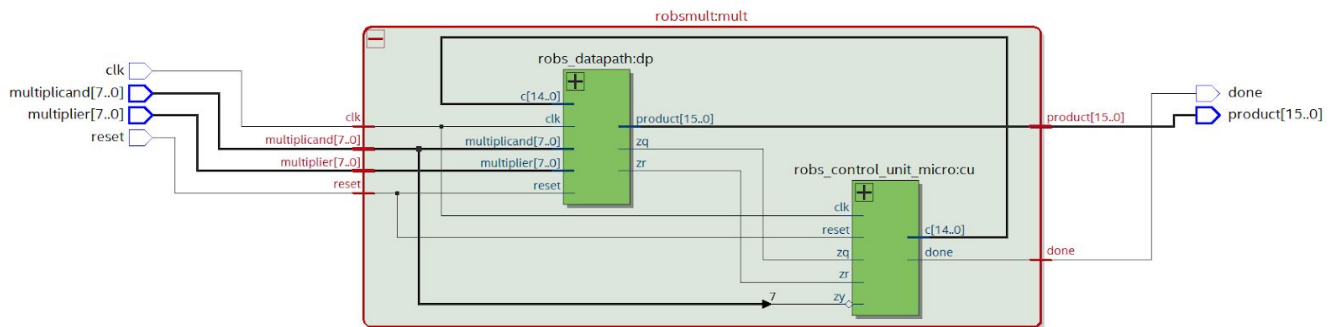




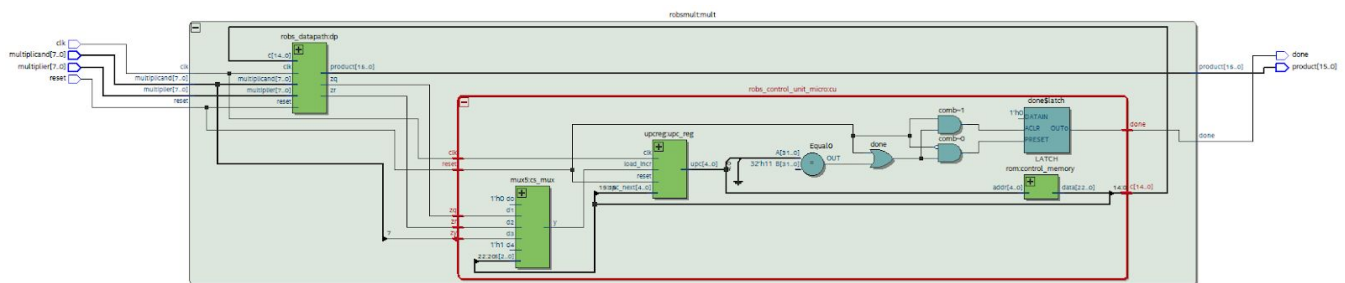
4a.



4b.



4c.



## 5.1

# Simulation failed c000 != 4000 = 80 \* 80

## 5.2

There were no Warnings in the Transcript

## 5.3

Warning (18236): Number of processors has not been specified which may cause overloading on shared machines. Set the global assignment NUM\_PARALLEL\_PROCESSORS in your QSF to an appropriate value for best performance.

Warning (10230): Verilog HDL assignment warning at upc\_reg.sv(24): truncated value with size 32 to match size of target (5)

Warning (10030): Net "mem.data\_a" at rom.sv(7) has no driver or initial value, using a default initial value '0'

Warning (10030): Net "mem.waddr\_a" at rom.sv(7) has no driver or initial value, using a default initial value '0'

Warning (10030): Net "mem.we\_a" at rom.sv(7) has no driver or initial value, using a default initial value '0'

Warning (10230): Verilog HDL assignment warning at counter\_down.sv(18): truncated value with size 32 to match size of target (8)

Warning (10230): Verilog HDL assignment warning at counter\_down.sv(26): truncated value with size 32 to match size of target (8)

No Errors in Quartus

## 5.4

The threshold for the bug seems to be around the -60's when going through all of the multiplications of numbers between -66 and -62, the multiplier failed when the multiplier was 0xBF (-65) and the multiplicand was 0xBE (-65).