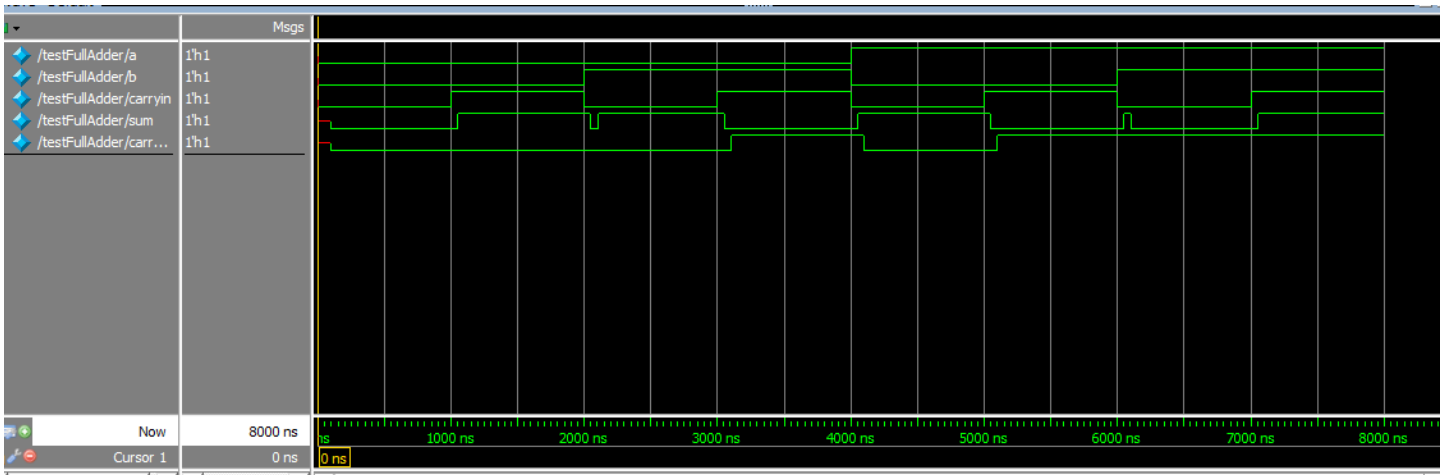


CA Homework 2

Kyle Mayer

9/22/2014

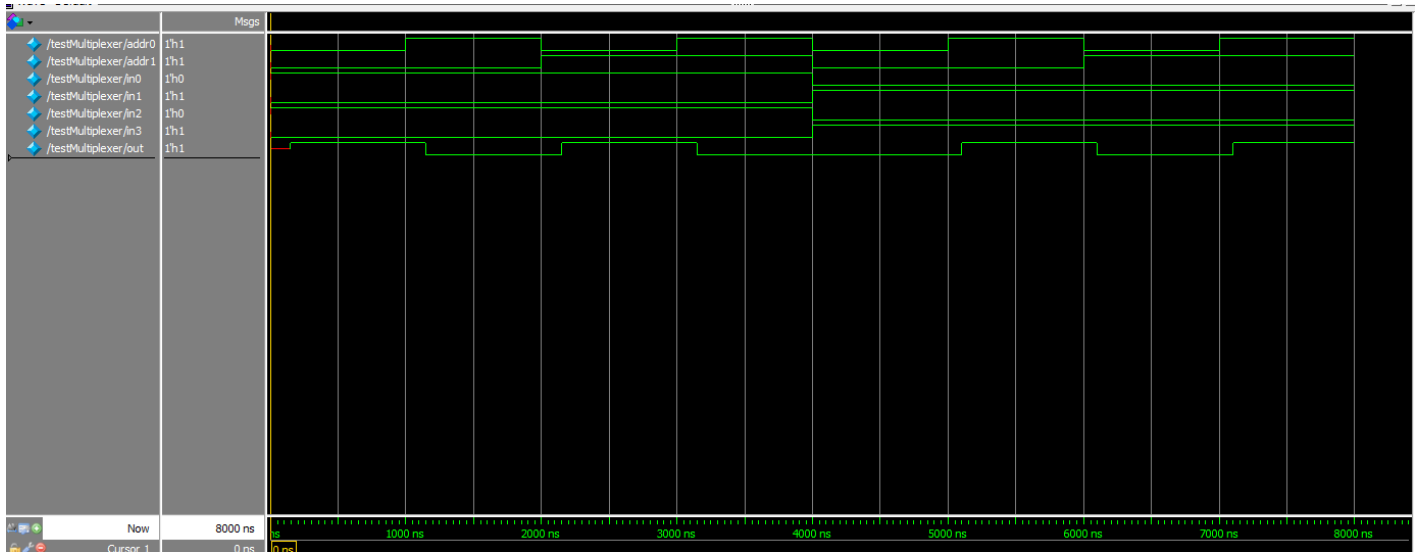
Full Adder:



```
# vsim -gui
# Start time: 13:33:36 on Sep 22,2014
# Loading work.testFullAdder
# Loading work.structuralFullAdder
# a  b Cin | Cout sum | Expected Output
# 0  0  0 | 0    0 | Zero  (00)
# 0  0  1 | 0    1 | One   (01)
# 0  1  0 | 0    1 | One   (01)
# 0  1  1 | 1    0 | Two   (10)
# 1  0  0 | 0    1 | One   (01)
# 1  0  1 | 1    0 | Two   (10)
# 1  1  0 | 1    0 | Two   (10)
# 1  1  1 | 1    1 | Three (11)
```

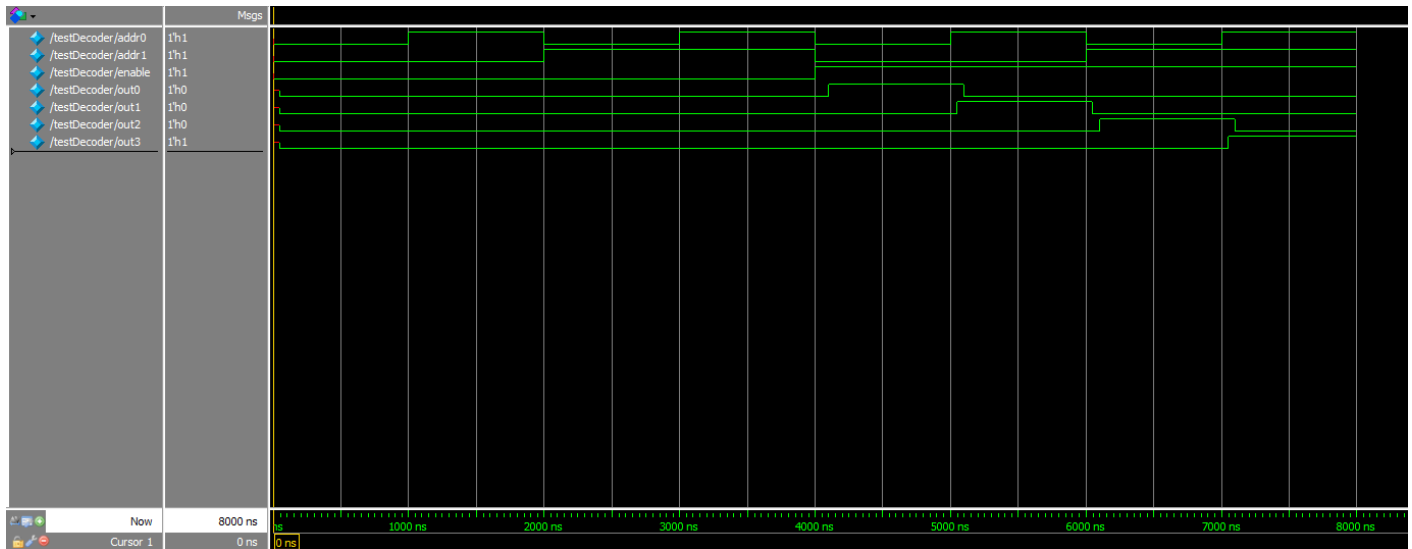
Multiplexer:

Note: only two combinations of a0,a1,a2,a3 are shown below to reduce the size of the truth table



```
# vsim
# Start time: 20:59:24 on Sep 22,2014
# Loading work.testMultiplexer
# Loading work.structuralMultiplexer
# A1 A0 | in3 in2 in1 in0 | out | Expected Output
# 0 0 | 0 1 0 1 | 1 | Input 0 (1)
# 0 1 | 0 1 0 1 | 0 | Input 1 (0)
# 1 0 | 0 1 0 1 | 1 | Input 2 (1)
# 1 1 | 0 1 0 1 | 0 | Input 3 (0)
# 0 0 | 1 0 1 0 | 0 | Input 0 (0)
# 0 1 | 1 0 1 0 | 1 | Input 1 (1)
# 1 0 | 1 0 1 0 | 0 | Input 2 (0)
# 1 1 | 1 0 1 0 | 1 | Input 3 (1)
```

Decoder:



```
# vsim
# Start time: 21:08:17 on Sep 22,2014
# Loading work.testDecoder
# Loading work.structuralDecoder
# En A0 A1| O0 O1 O2 O3 | Expected Output
# 0 0 0 | 0 0 0 0 | All false
# 0 1 0 | 0 0 0 0 | All false
# 0 0 1 | 0 0 0 0 | All false
# 0 1 1 | 0 0 0 0 | All false
# 1 0 0 | 1 0 0 0 | O0 Only
# 1 1 0 | 0 1 0 0 | O1 Only
# 1 0 1 | 0 0 1 0 | O2 Only
# 1 1 1 | 0 0 0 1 | O3 Only
```