Lab 8 – Simulation

ELEX – 2117

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CODE:

```
//lab8.sv
//moving average filter with saturation arithmetic
// Brennan Pinette 4/5/2021



module lab8
  ( input logic clk,
       input logic [3:0] x,
       output logic [3:0] y ) ;


       logic [3:0]x0;
       logic [4:0] tmp;



       always_ff@(posedge clk) x0 = x;


       assign tmp =
    x0 + x ;

       assign y =
       tmp > 4'b1111 ? 4'b1111 : tmp ;




endmodule
```
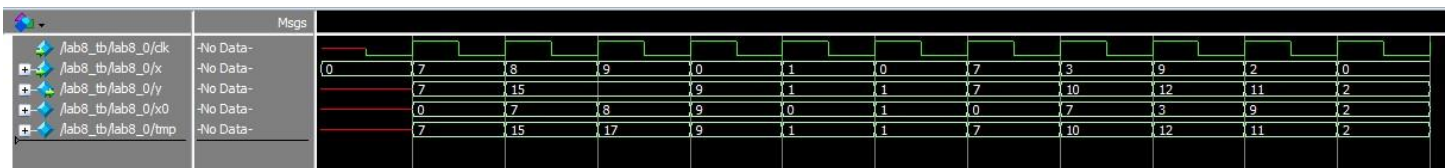
```
VSIM 58> run -all
# test passed: x= 0 and y= x
# test passed: x= 7 and y= 7
# test passed: x= 8 and y=15
# test passed: x= 9 and y=15
# test passed: x= 0 and y= 9
# test passed: x= 1 and y= 1
# test passed: x= 0 and y= 1
# test passed: x= 7 and y= 7
# test passed: x= 3 and y=10
# test passed: x= 9 and y=12
# test passed: x= 2 and y=11
# test passed: x= 0 and y= 2
# passed          12 test vectors
```

Waveforms:

Signal	Msgs												
/lab8_tb/lab8_0/clk	-No Data-												
/lab8_tb/lab8_0/x	-No Data-	0	7	8	9	0	1	0	7	3	9	2	0
/lab8_tb/lab8_0/y	-No Data-	7	15		9	1	1	7	10	12	11	2	
/lab8_tb/lab8_0/x0	-No Data-	0	7	8	9	0	1	0	7	3	9	2	
/lab8_tb/lab8_0/tmp	-No Data-	7	15	17	9	1	1	7	10	12	11	2	

Lab8.tv:

```
lab8.txt - Notepad
File  Edit  Format  View  Help
0        x
7        7
8        15
9        15
0        9
1        1
0        1
7        7
3        10
9        12
2        11
0        2
```