

Lab 1: 8-bit Adder

EECE 2323 – Prof. Miriam Leeser

By: Alex Oswald

Due: 09/25/2020

§ 3.2 – Entering Your Design

eightbit_adder.v

```

1. `timescale 1ns / 10ps
2. //////////////////////////////////////
3. // Company:    EECE 2323: Lab for EECE 2322
4. // Engineer:   Alex Oswald
5. //
6. // Create Date: 09/22/2020 11:39:48 AM
7. // Module Name: eightbit_adder
8. //////////////////////////////////////
9.
10.
11. module eightbit_adder(
12.
13.     input [7:0] a,
14.     input [7:0] b,
15.     output [7:0] f,
16.     output ovf
17. );
18.
19.     assign f = a + b;
20.     assign ovf = (a[7] && b[7] && ~f[7]) || (~a[7] && ~b[7] && f[7]);
21.
22. endmodule

```

§ 3.3 – Entering Your Design

adder8_tb.v

```

1. `timescale 1ns / 10ps
2. //////////////////////////////////////
3. // Company:    EECE 2323: Lab for EECE 2322
4. // Engineer:   Alex Oswald
5. //
6. // Create Date: 09/22/2020 11:58:54 AM
7. // Module Name: adder8_tb
8. //////////////////////////////////////
9.
10.
11. module adder8_tb ();
12.     reg signed [7:0] a;
13.     reg signed [7:0] b;
14.     wire signed [7:0] f;
15.     wire ovf;
16.
17.     eightbit_adder uut
18.         (.a(a),
19.          .b(b),
20.          .f(f),
21.          .ovf(ovf));
22.
23.     // Test Vectors
24.     initial
25.     begin
26.         #10 a = 8'd0; b = 8'd0;
27.         #10 a = 8'd12; b = 8'd34;
28.         #10 a = -8'd12; b = -8'd34;

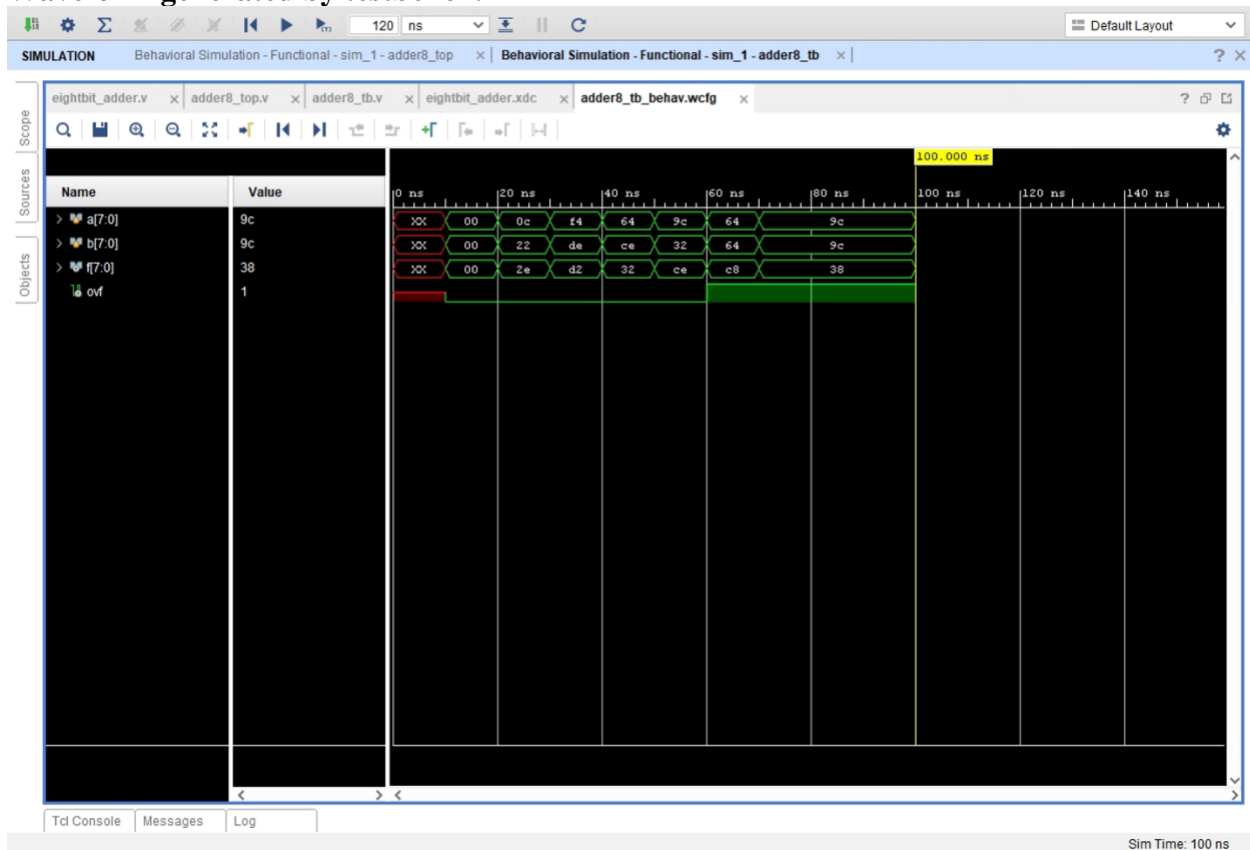
```

```

29.      #10 a = 8'd100; b = -8'd50;
30.      #10 a = -8'd100; b = 8'd50;
31.      #10 a = 8'd100; b = 8'd100;
32.      #10 a = -8'd100; b = -8'd100;
33.      end
34.
35. endmodule

```

Waveform generated by testbench.



§ 4.2.3 – Testing the 8-bit adder in Hardware: Testing your Design in Hardware
See attached video on Canvas.