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. //////////////////////////////////////////////////////////////////////////////////

11. module eightbit\_adder(
13. input [7:0] a,
14. input [7:0] b,
15. output [7:0] f,
16. output ovf
17. );
19. assign f = a + b;
20. assign ovf = (a[7] && b[7] && ~f[7]) || (~a[7] && ~b[7] && f[7]);
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. //////////////////////////////////////////////////////////////////////////////////

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;
17. eightbit\_adder uut
18. (.a(a),
19. .b(b),
20. .f(f),
21. .ovf(ovf));
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
35. endmodule

**Waveform generated by testbench.**

**Graphical user interface

Description automatically generated**

§ 4.2.3 – Testing the 8-bit adder in Hardware: Testing your Design in Hardware

**See attached video on Canvas.**