

```
1  `timescale 1ns/1ps
2
3  module tb_ula_8b;
4
5      // Entradas
6      reg [7:0] a, b;
7      reg x, y;
8
9      // Saídas
10     wire [7:0] s;
11     wire c, ov, z, n;
12
13     // Instancia a ULA
14     ula_8b dut (
15         .a(a), .b(b), .x(x), .y(y),
16         .s(s), .c(c), .ov(ov), .z(z), .n(n)
17     );
18
19     // Procedimento de teste
20     initial begin
21         $display("x y | a b | s | c ov z n");
22         $display("-----+-----+-----+-----");
23
24         // Teste de soma sem overflow
25         x = 0; y = 0; a = 8'd10; b = 8'd20; #10;
26         $display("%b %b | %h %h | %h | %b %b %b %b", x, y, a, b, s, c, ov, z, n);
27
28         // Teste de soma com carry e overflow (127 + 1)
29         x = 0; y = 0; a = 8'd127; b = 8'd1; #10;
30         $display("%b %b | %h %h | %h | %b %b %b %b", x, y, a, b, s, c, ov, z, n);
31
32         // Teste de soma negativa com overflow (-128 + -128)
33         x = 0; y = 0; a = 8'b10000000; b = 8'b10000000; #10;
34         $display("%b %b | %b %b | %b | %b %b %b %b", x, y, a, b, s, c, ov, z, n);
35
36         // Teste de soma com resultado zero (127 + -127)
37         x = 0; y = 0; a = 8'd127; b = -8'd127; #10;
38         $display("%b %b | %h %h | %h | %b %b %b %b", x, y, a, b, s, c, ov, z, n);
39
40         // Teste de AND
41         x = 0; y = 1; a = 8'b11001100; b = 8'b10101010; #10;
42         $display("%b %b | %b %b | %b | %b %b %b %b", x, y, a, b, s, c, ov, z, n);
43
44         // Teste de OR
45         x = 1; y = 0; a = 8'b11001100; b = 8'b10101010; #10;
46         $display("%b %b | %b %b | %b | %b %b %b %b", x, y, a, b, s, c, ov, z, n);
47
48         // Teste de NOT
49         x = 1; y = 1; a = 8'b11110000; b = 8'b00000000; #10; // b não importa no NOT
50         $display("%b %b | %b %b | %b | %b %b %b %b", x, y, a, b, s, c, ov, z, n);
51
52         $finish;
53     end
54 endmodule
55
56
```