```
1   module Counter_3b (clk, reset, in, out);
2      input  logic clk, reset, in;
3      output logic [2:0] out;
4
5      logic [2:0] ps, ns;
6
7      always_comb begin
8         ns = ps + in;
9      end
10
11     assign out = ps;
12
13     always_ff @(posedge clk) begin
14        if (reset)
15           ps <= 3'b0;
16        else
17           ps <= ns;
18     end
19  endmodule
20
21  module Counter_3b_testbench ();
22     logic clk, reset, in;
23     logic [2:0] out;
24
25     Counter_3b dut(.clk, .reset, .in, .out);
26
27     parameter CLOCK_PERIOD = 100;
28     initial begin
29        clk <= 0;
30        forever #(CLOCK_PERIOD/2) clk <= ~clk;
31     end
32
33     initial begin                                    @(posedge clk);
34        reset <= 1;                                   @(posedge clk);
35        reset <= 0; in <= 0;                          @(posedge clk);
36                                                      @(posedge clk);
37        in <= 1;                                      @(posedge clk);
38        in <= 0;                                      @(posedge clk);
39                                                      @(posedge clk);
40        in <= 1;                                      @(posedge clk);
41                                                      @(posedge clk);
42                                                      @(posedge clk);
43                                                      @(posedge clk);
44                                                      @(posedge clk);
45                                                      @(posedge clk);
46        in <= 0;                                      @(posedge clk);
47                                                      @(posedge clk);
48        in <= 1;                                      @(posedge clk);
49        in <= 0;                                      @(posedge clk);
50        reset <= 1;                                   @(posedge clk);
51        reset <= 0;                                   @(posedge clk);
52        $stop;
53     end
54  endmodule
```