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1  -- VHDL 8 bit processor Project
2  -- D Flip Flop Test Bench
3  -- James Hicks November 1 2023
4
5  library ieee;
6  use ieee.std_logic_1164.all;
7  use ieee.numeric_std.all;
8
9  entity t_ff_tb is
10 end t_ff_tb;
11
12 architecture tb of t_ff_tb is
13
14     signal t, en, rst, clk, q : std_logic := '0';
15
16     constant clk_period : time := 10 ns;
17
18 begin
19
20     DUT: entity work.t_ff_en(two_seg_arch)
21     port map (t => t,
22               en => en,
23               rst => rst,
24               clk => clk,
25               q => q
26             );
27
28     -- clock process
29     clk_process : process
30     begin
31         loop
32             wait for clk_period / 2;
33             clk <= not clk;
34         end loop;
35     end process;
36
37     -- data process
38     t_process : process
39     begin
40         wait for 20 ns;
41         t <= '1';
42         wait for 30 ns;
43         t <= '0';
44         wait for 40 ns;
45         t <= '1';
46         for I in 1 to 9 loop
47             wait for 10 ns;
48             t <= not t;
49         end loop;
50         wait for 20 ns;
51         t <= '1';
52         wait;
53     end process;
54
55     -- enable process
56     en_process : process
57     begin
58         wait for 20 ns;
59         en <= '1';
60         wait for 210 ns;
61         en <= '0';
62         wait for 30 ns;
63     end process;
64
65     -- termination process
66     termination_process : process
67     begin
68         wait for 260 ns;
69         assert false report "end of test" severity failure;

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70     end process;
71
72     -- rst process
73     rst_process : process
74     begin
75         rst <= '1';
76         wait for clk_period / 2;
77         rst <= '0';
78         wait;
79     end process;
80 end tb;
```