

Code:

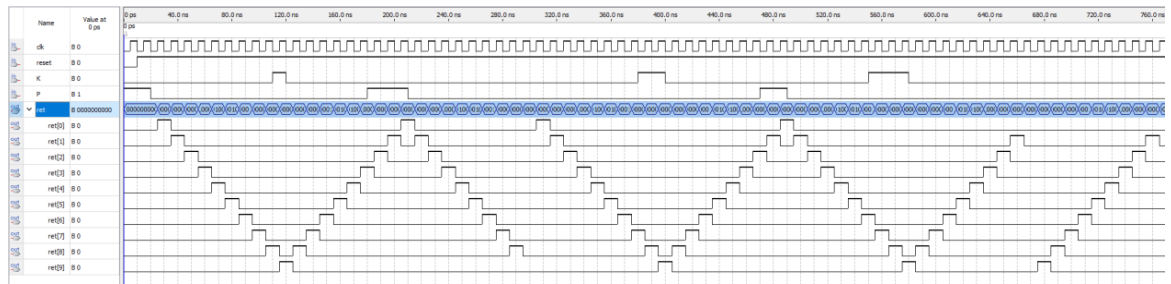
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1  Library ieee;
2  use ieee.std_logic_1164.all;
3  use ieee.std_logic_unsigned.all;
4
5  entity table_tennis is
6  port(
7      clk: in std_logic;
8      res: in std_logic;
9      p: in std_logic;
10     k: in std_logic;
11     ret: out std_logic_vector(0 to 9)
12 );
13 end table_tennis;
14
15 architecture table_tennis of table_tennis is
16     type s is(s0, s1, s2, s3, s4, s5, s6, s7, s8, s9,
17              s10, s11, s12, s13, s14, s15, s16, s17, s18, s19, s20, s21
18 );
19     signal now_s: s;
20     signal nxt_s: s;
21 begin
22     process(clk, res)
23     begin
24         if res = '0' then now_s <= s0;
25         elsif clk'event and clk='1' then now_s <= nxt_s;
26         end if;
27     end process;
28
29     process(p, k, now_s)
30     begin
31         case now_s is
32             when s0 =>
33                 if p = '0' then nxt_s <= s1;
34                 else nxt_s <= s0;
35                 end if;
36                 ret <= "0000000000";
37             when s1 =>
38                 nxt_s <= s2;
39                 ret <= "1000000000";
40             when s2 =>
41                 nxt_s <= s3;
42                 ret <= "0100000000";
43             when s3 =>
44                 nxt_s <= s4;
45                 ret <= "0010000000";
46             when s4 =>
47                 nxt_s <= s5;
48                 ret <= "0001000000";
49             when s5 =>
50                 nxt_s <= s6;
51                 ret <= "0000100000";
52             when s6 =>
53                 nxt_s <= s7;
54                 ret <= "0000010000";
55             when s7 =>
56                 nxt_s <= s8;
57                 ret <= "0000001000";
58             when s8 =>
59                 nxt_s <= s9;
60                 ret <= "0000000100";
61             when s9 =>
62                 if k = '0' then nxt_s <= s0;
63                 else nxt_s <= s10;
64                 end if;
65                 ret <= "0000000010";
66             when s10 =>
67                 if k = '0' then nxt_s <= s11;
68                 else nxt_s <= s0;
69                 end if;
```

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70         ret <= "0000000001";
71     when s11 =>
72         nxt_s <= s12;
73         ret <= "0000000010";
74     when s12 =>
75         nxt_s <= s13;
76         ret <= "0000000100";
77     when s13 =>
78         nxt_s <= s14;
79         ret <= "0000001000";
80     when s14 =>
81         nxt_s <= s15;
82         ret <= "0000010000";
83     when s15 =>
84         nxt_s <= s16;
85         ret <= "0000100000";
86     when s16 =>
87         nxt_s <= s17;
88         ret <= "0001000000";
89     when s17 =>
90         nxt_s <= s18;
91         ret <= "0010000000";
92     when s18 =>
93         if p = '0' then nxt_s <= s20;
94         else nxt_s <= s19;
95         end if;
96         ret <= "0100000000";
97     when s19 =>
98         if p = '0' then nxt_s <= s2;
99         else nxt_s <= s20;
100        end if;
101        ret <= "1000000000";
102    when s20 =>
103        if k = '0' then nxt_s <= s21;
104        else nxt_s <= s20;
105        end if;
106        ret <= "0000000000";
107    when s21 =>
108        nxt_s <= s11;
109        ret <= "0000000001";
110    end case;
111    end process;
112    end table_tennis;

```

模擬:



流程圖:

