CS201P Assignment 5 (LAB)

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Pattern Generator code:

pattern_gen.v *

```
1  `timescale 1ns / 1ps
2  module CKT(clk,en,gen,in,Y);
3  input clk, en, gen, in;
4  output reg [3:0] Y = 4'b0000;
5  reg in_prev ;
6  always@(posedge clk)
7  begin
8  if (en)
9      begin
10         if (in)
11             begin
12             if (!in_prev)
13             Y <= 4'b0000;
14             else
15             Y <= Y + 4'b0010;
16             end
17         else
18             begin
19             if (in_prev)
20             Y <= 4'b0000;
21             else
22                 begin
23                     case(Y)
24                     4'b0000 : Y <= 4'b0001;
25                     4'b1111 : Y <= 4'b0000;
26                     default : Y <= Y + 4'b0010;
27                     endcase
28                 end
29             end
30     end
31 else
32     Y<= 4'bXXXX;
33 in_prev <= in;
34 end
35
36 endmodule
```

Testbench:

tb_ckt.v

```
1  `timescale 1ns / 1ps
2
3  module tb_ckt;
4
5  reg clk, en, gen ,in;
6  wire[3:0] Y;
7
8  CKT uut(
9  .clk(clk), .en(en), .gen(gen) , .in(in), .Y(Y)
10 );
11
12 initial clk = 0;
13 always #20 clk = ~clk;
14
15 initial begin
16 en = 1;gen = 1; in = 1; #1000000
17 in = 0 ;#10000;
18
19 end
20 endmodule
21
22
```

Output: