DAY-34

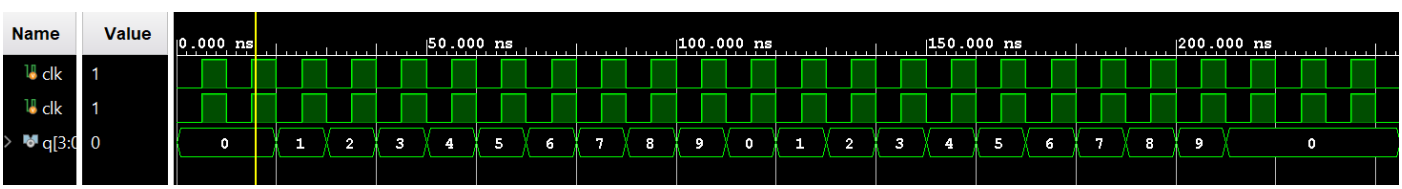
#100DAYSRTL

“Aim”:-To Design Non-binary Ripple counter (Decade counter or Mod10 counter).

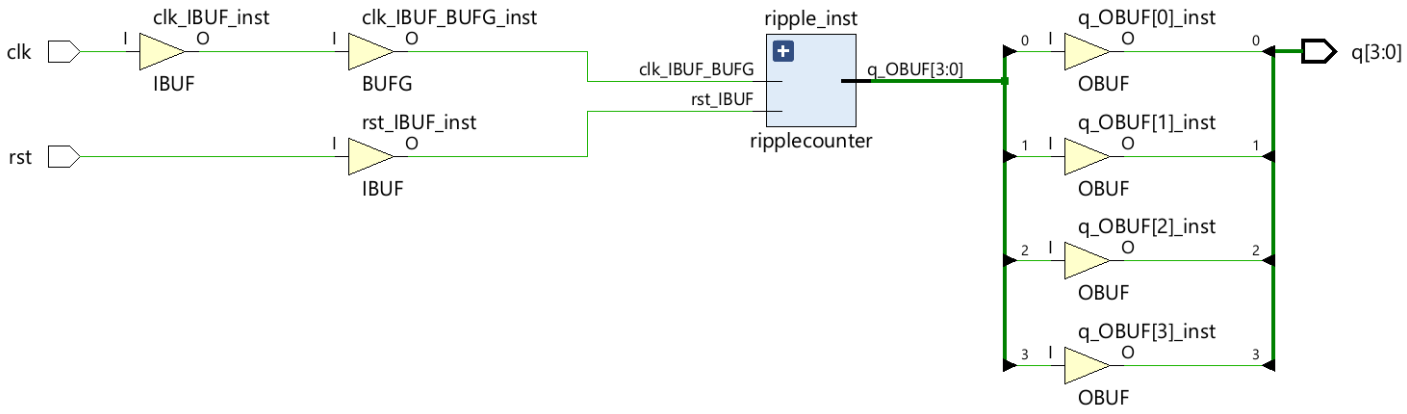
“Design Code”:-

```
module decade_counter(clk, rst, q);
  input clk, rst;
  output [3:0] q;
  wire q31_condition;
  assign q31_condition = (q[3] == 1'b1) && (q[1] == 1'b1);// Detect when q[3] and q[1] are both 1
  ripplecounter ripple_inst(.clk(clk), .rst(rst || q31_condition), .q(q));
endmodule
module ripplecounter(clk,rst,q); //Ripple counter using T flipflop
  input clk,rst;
  output [3:0]q;
  tff tf1(q[0],clk,rst);
  tff tf2(q[1],q[0],rst);
  tff tf3(q[2],q[1],rst);
  tff tf4(q[3],q[2],rst);
endmodule
module tff(q,clk,rst); //T flipflop using D-flipflop always in toggling mode
  input clk,rst;
  output q;
  wire d;
  dff df1(q,d,clk,rst);
  not n1(d,q);
endmodule
module dff(q,d,clk,rst); //D-flipflop
  input d,clk,rst;
  output q;
  reg q;
  always @(negedge clk or posedge rst)
   begin
    if(rst) q=1'b0;
    else q=d;
   end
endmodule
```

“Waveforms”:-



“Schematics”:-



Summary

Power estimation from Synthesized netlist. Activity derived from constraints files, simulation files or vectorless analysis. Note: these early estimates can change after implementation.

Total On-Chip Power:	**3.162 W**
Design Power Budget:	**Not Specified**
Power Budget Margin:	**N/A**
Junction Temperature:	**31.0°C**
Thermal Margin:	54.0°C (28.5 W)
Effective ϑJA:	1.9°C/W
Power supplied to off-chip devices:	0 W
Confidence level:	Low

Launch Power Constraint Advisor to find and fix invalid switching activity

On-Chip Power