DAY-39

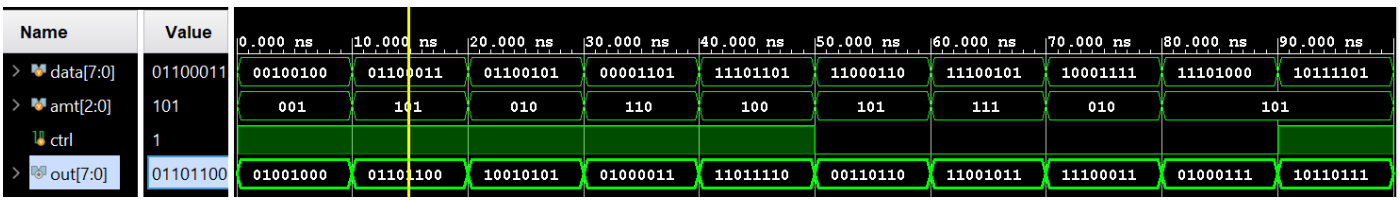
#100DAYSRTL

“Aim”:-To design a Multi-Functional barrel shifter (rotates left or right)

“Design Code”:-

```
module barrel_shifter_multi(input [7:0] data,input [2:0] amt,input ctrl,output reg [7:0] out);
always @(*) begin
    if(ctrl) begin
        case (amt)
            3'd0: out = data;
            3'd1: out = {data[0], data[7:1]};
            3'd2: out = {data[1:0], data[7:2]};
            3'd3: out = {data[2:0], data[7:3]};
            3'd4: out = {data[3:0], data[7:4]};
            3'd5: out = {data[4:0], data[7:5]};
            3'd6: out = {data[5:0], data[7:6]};
            default  out = {data[6:0], data[7]};
            endcase
            end
       else begin
        case (amt)
            3'd0: out = data;
            3'd1: out = {data[6:0], data[7]};
            3'd2: out = {data[5:0], data[7:6]};
            3'd3: out = {data[4:0], data[7:5]};
            3'd4: out = {data[3:0], data[7:4]};
            3'd5: out = {data[2:0], data[7:3]};
            3'd6: out = {data[1:0], data[7:2]};
            default  out = {data[0], data[7:1]};
        endcase
    end
    end
    endmodule
```

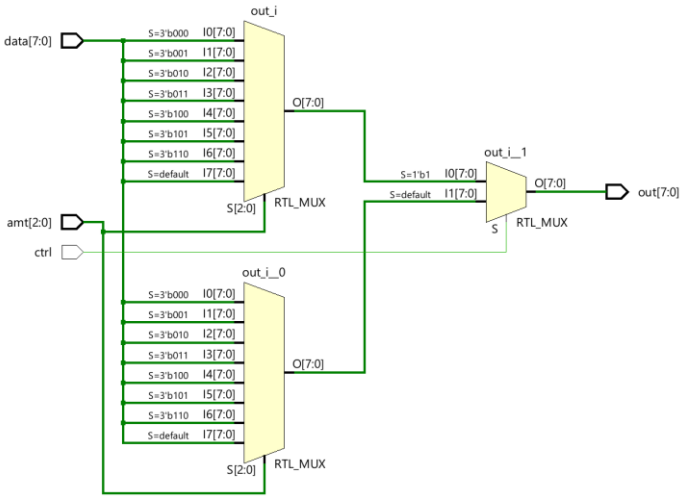
“Waveforms”:-



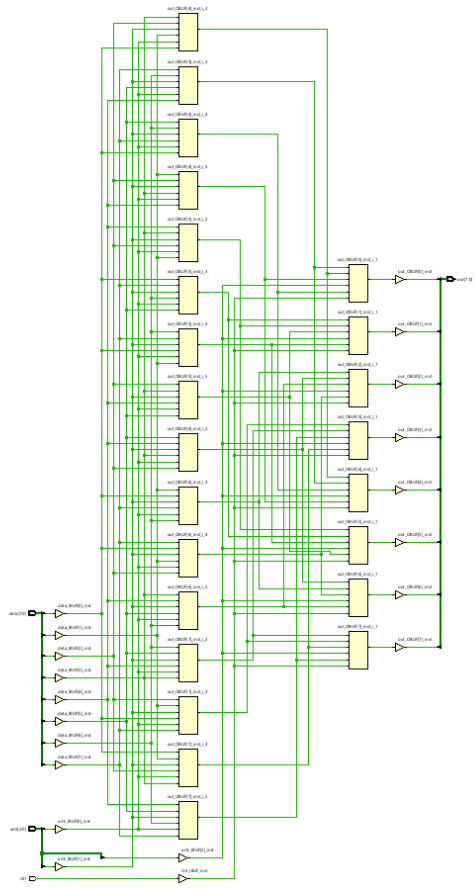
“Console”:-

```
Type=Left,data=00100100,amt=001,ctrl=1,out=01001000
Type=Left,data=01100011,amt=101,ctrl=1,out=01101100
Type=Left,data=01100101,amt=010,ctrl=1,out=10010101
Type=Left,data=00001101,amt=110,ctrl=1,out=01000011
Type=Left,data=11101101,amt=100,ctrl=1,out=11011110
Type=right,data=11000110,amt=101,ctrl=0,out=00110110
Type=right,data=11100101,amt=111,ctrl=0,out=11001011
Type=right,data=10001111,amt=010,ctrl=0,out=11100011
Type=right,data=11101000,amt=101,ctrl=0,out=01000111
Type=Left,data=10111101,amt=101,ctrl=1,out=10110111
```

“Elaborated Design”:-



“Implemented Design”:-



Summary

Power analysis from Implemented netlist. Activity derived from constraints files, simulation files or vectorless analysis.

Total On-Chip Power:	**4.704 W**
Design Power Budget:	**Not Specified**
Power Budget Margin:	**N/A**
Junction Temperature:	**33.9°C**
Thermal Margin:	51.1°C (27.0 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