



DAY-35

#100DAYSOFRTL

Aim:- Implementation of 3x8 Decoder using 2x4 Decoder.

RTL CODE:-

```
///DATE:-04/02/2024
///Implementation of 3x8 Decoder using 2x4 Decoder
module Decoder1_2x4(input [1:0] A, input E,
    output [3:0] Y);
    wire w1,w2,w3,w4;
    and g1(Y[0], (~A[1]), (~A[0]), E);
    and g2(Y[1], (~A[1]), (A[0]), E);
    and g3(Y[2], (A[1]), (~A[0]), E);
    and g4(Y[3], (A[1]), (A[0]), E);
endmodule

module Decoder_3x8(input [1:0] A,
    input E, output [7:0] Y );
    wire w;
    not g1(w,E);
    Decoder1_2x4 A1(A[1:0],w,Y[3:0]);
    Decoder1_2x4 A2(A[1:0],E,Y[7:4]);
endmodule
```

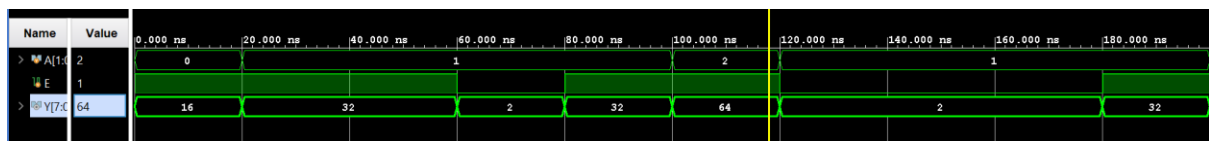
TESTBENCH:-

```
module Decoder_tb();
    reg [1:0] A;
    reg E;
    wire [7:0] Y;
    Decoder_3x8 uut(A,E,Y);
    initial begin
        for(int i=0; i<10; i=i+1) begin
            A=$random();
            E=$random();
            #10;
            $display("A=%d,E=%d,Y=%d",A,E,Y);
            #10;
        end
        end
        initial begin
            #200;
            $finish();
        end
    endmodule
```

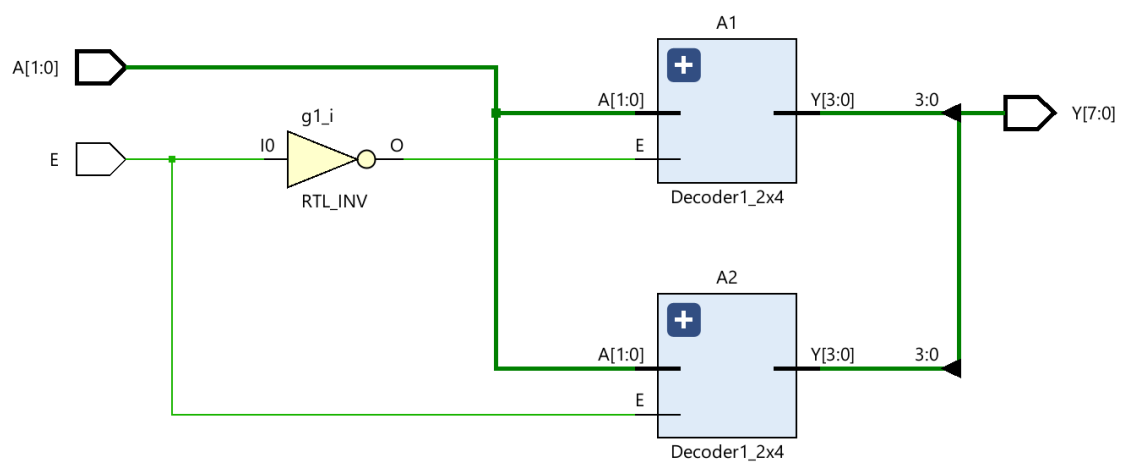
OUTPUT:-

A=0, E=1, Y= 16
A=1, E=1, Y= 32
A=1, E=1, Y= 32
A=1, E=0, Y= 2
A=1, E=1, Y= 32
A=2, E=1, Y= 64
A=1, E=0, Y= 2
A=1, E=0, Y= 2
A=1, E=0, Y= 2
A=1, E=1, Y= 32

WAVEFORMS:-



SCHEMATIC:-



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