DAY-30

#100DAYSOFRTL

Aim:- Implementation of 2-Bit Comparator Using 1-Bit Comparator.

RTL CODE:-

```
////DATE:-30/01/2024
////Implementation of 2bit Comparator using 1bit Comparator
module Comp1_1Bit(input A,B,
 output L,E,G);
wire w1,w2;
xnor g1(E,A,B);
not g2(w1,A);
not g3(w2,B);
and g4(G,A,w2);
and g5(L,B,w1);
endmodule

module Comp_2Bit(input [1:0] A, B,
output  L,E,G);
wire [1:0] P,Q,R;
wire w1,w2;
Comp1_1Bit T1(A[0],B[0],P[0],Q[0],R[0]);
Comp1_1Bit T2(A[1],B[1],P[1],Q[1],R[1]);
and g1(E,Q[0],Q[1]);
and g2(w1,Q[1],P[0]);
and g3(w2,Q[1],R[0]);
or g4(G,R[1],w2);
or g5(L,P[1],w1);
endmodule
```

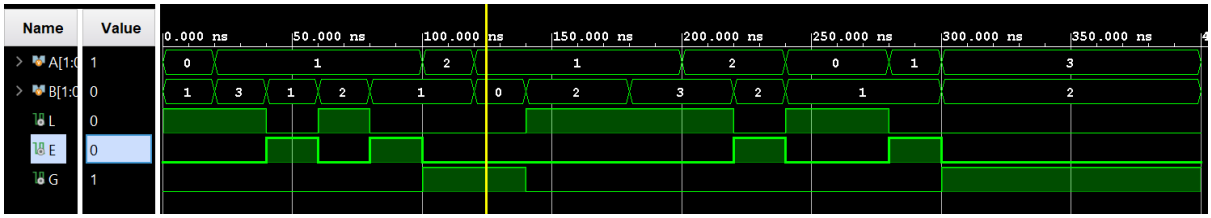
TESTBENCH:-

```
module Comp_2Bit_tb();
reg [1:0] A,B;
wire L,E,G;
Comp_2Bit uut(A,B,L,E,G);
initial begin
for(int i=0; i<16; i=i+1) begin
A=$random();
B=$random();
#10;
$display("A=%d,B=%d,L=%d,E=%d,G=%d",A,B,L,E,G);
#10;
end
end
initial begin
#300;
$finish();
end
endmodule
```

OUTPUT:-

```
A=0,B=1,L=1,E=0,G=0
A=1,B=3,L=1,E=0,G=0
A=1,B=1,L=0,E=1,G=0
A=1,B=2,L=1,E=0,G=0
A=1,B=1,L=0,E=1,G=0
A=2,B=1,L=0,E=0,G=1
A=1,B=0,L=0,E=0,G=1
A=1,B=2,L=1,E=0,G=0
A=1,B=2,L=1,E=0,G=0
A=1,B=3,L=1,E=0,G=0
A=2,B=3,L=1,E=0,G=0
A=2,B=2,L=0,E=1,G=0
A=0,B=1,L=1,E=0,G=0
A=0,B=1,L=1,E=0,G=0
A=1,B=1,L=0,E=1,G=0
```

WAVEFORMS:-



SCHEMATIC:-