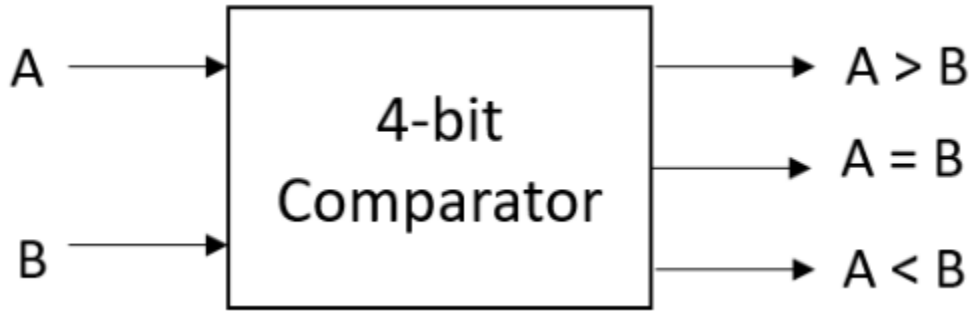
Day14- N Bit Comparator #75daysRTL

A magnitude digital Comparator is a combinational circuit that compares two digital or binary numbers to determine whether one binary number is equal, less than, or greater than the other binary number.

We have taken the case of 16-bit input to the corresponding outputs.

Block Diagram of 4-Bit Comparator-



Verilog Code –

```
module Nbit_Comparator(A,B,A_grt_B,A_eq_B,A_less_B);
parameter n=16;
input [n-1:0] A, B;
output reg A_grt_B, A_less_B, A_eq_B;


  always@(*) begin
    A_grt_B = 0; A_less_B = 0; A_eq_B = 0;
    if(A>B) A_grt_B = 1'b1;
    else if(A<B) A_less_B = 1'b1;
    else A_eq_B = 1'b1;
  end
endmodule
```

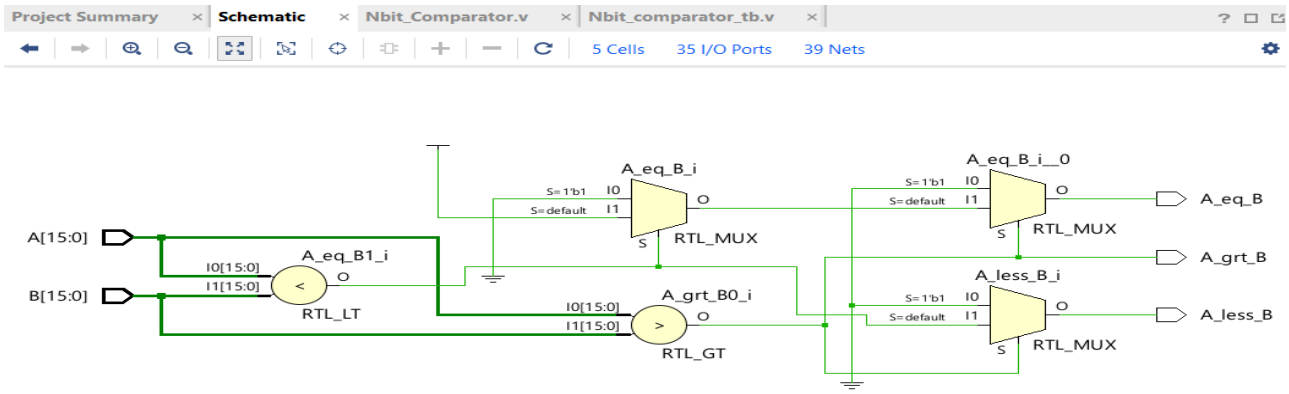
TestBench Code-

```
module Nbit_comparator_tb();
  reg [15:0] A, B;
wire A_grt_B, A_less_B, A_eq_B;
```

```
Nbit_Comparator comp(A, B, A_grt_B, A_less_B, A_eq_B);


initial begin
  $monitor("A = %0h, B = %0h -> A_grt_B = %0b, A_less_B = %0b, A_eq_B = %0b", A, B,
A_grt_B, A_less_B, A_eq_B);
  repeat(5) begin
    A=$random; B=$random; #10;
  end
end
endmodule
```

Schematic View of NBit_Comparator-



Simulation Result of NBit_Comparator-