#50DAYS CHALLENGE

DAY 9

8:3 ENCODER

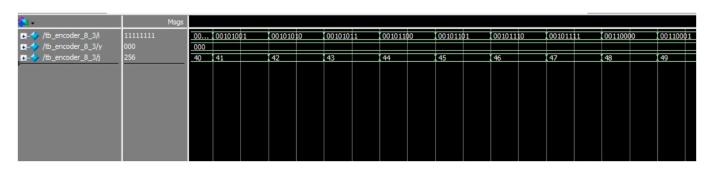
a)Design Code

```
module encoder_8_3(
                                 input wire [7:0]i,
                                 output reg [2:0]y);
always@(*)
begin
case(i)
8'b00000001: y=3'b000;
8'b00000010:y=3'b001;
8'b00000100:y=3'b010;
8'b00001000:y=3'b011;
8'b000100000: y=3'b100;
8'b00100000:y=3'b101;
8'b01000000:y=3'b110;
8'b10000000:y=3'b111;
default:y=3'b000;
endcase
end
endmodule
```

b)Testbench

```
| module tb_encoder_8_3();
reg [7:0]i;
wire [2:0]y;
integer j;
encoder_8_3 dut(i,y);
task initialize;
begin
 {i}=0;
end
endtask
task inputs(input [7:0]j);
begin
 i=j;
end
endtask
initial
begin
 for(j=0;j<256;j=j+1)
begin
 inputs(j);
 #10;
end
 end
 initial
 $monitor("input i=%8b | and output y=%3b",i,y);
 initial
 #3000 $finish();
endmodule
```

c)Waveform



d)Console Output

```
input i=000000000 | and output y=000
input i=00000001 | and output y=000
input i=00000010 | and output y=001
input i=00000011 | and output y=000
input i=00000100 | and output y=010
input i=00000101 | and output y=000
input i=00000110 | and output y=000
input i=00000111 | and output y=000
input i=00001000 | and output y=011
input i=00001001 | and output y=000
input i=00001010 | and output y=000
input i=00001011 | and output y=000
input i=00001100 | and output y=000
input i=00001101 | and output y=000
input i=00001110 | and output y=000
input i=00001111 | and output y=000
input i=000100000 | and output y=100
input i=00010001 | and output y=000
input i=00010010 | and output y=000
input i=00010011 | and output y=000
input i=00010100 | and output y=000
input i=00010101 | and output y=000
input i=00010110 | and output y=000
input i=00010111 | and output y=000
input i=00011000 | and output y=000
input i=00011001 | and output y=000
input i=00011010 | and output y=000
input i=00011011 | and output y=000
input i=00011100 | and output y=000
input i=00011101 | and output y=000
input i=00011110 | and output y=000
input i=00011111 | and output y=000
input i=001000000 | and output y=101
input i=00100001 | and output y=000 input i=00100010 | and output y=000
input i=00101111 | and output y=000
       i=00110000
                     and output y=000
and output y=000
input
input
       i=00110001
       i=00110010
                     and
                         output
input
input
       i=00110011
                     and
                         output
                                 v=000
       i=00110100
                                 y=000
input
                     and
                         output
                                 v=000
input
       i=00110101
                     and
                         output
       i=00110110
                     and
                                 y=000
input
                         output
       i=00110111
                                 v=000
input
                     and
                         output
                                 y=000
       i=00111000
i=00111001
input
                         output
                                 y=000
input
                     and
                         output
input
       i=00111010
                     and
                         output
                                 y=000
       i=00111011
input
                     and
                         output
input
       i=00111100
                     and
                         output
                                 v=000
       i=00111101
                                 y=000
input
                     and
                         output
input
       1=00111110
                     and
                         output
                                 v=000
       i=00111111
                                 y=000
input
                     and
                         output
                                 v = 110
input
       1=01000000
                     and
                         output
       i=01000001
input
                     and
                         output
       i=01000010
input
                     and
                         output
                                 y=000
input
                         output
                     and
input
       i=01000100
                     and
                         output
                                 v=000
input
       i=01000101
                     and
                         output
                                 y=000
input
       i=01000110
                     and
                         output
                                 v=000
       i=01000111
                         output
                                 y=000
input
                     and
input
       i=01001000
                     and
                         output
                                 v=000
                         output y=000
output y=000
       1=01001001
input
                     and
       i=01001010
input
                     and
                                 y=000
       i=01001011
                     and
input
                         output
       i=01001100
                                 v=000
input
                     and
                         output
                     and output y=000
and output y=000
input
       i=01001101
input i=01001110
input i=01001111 |
                     and output y=000
```