

Day10-Binary_Grey_Converterm

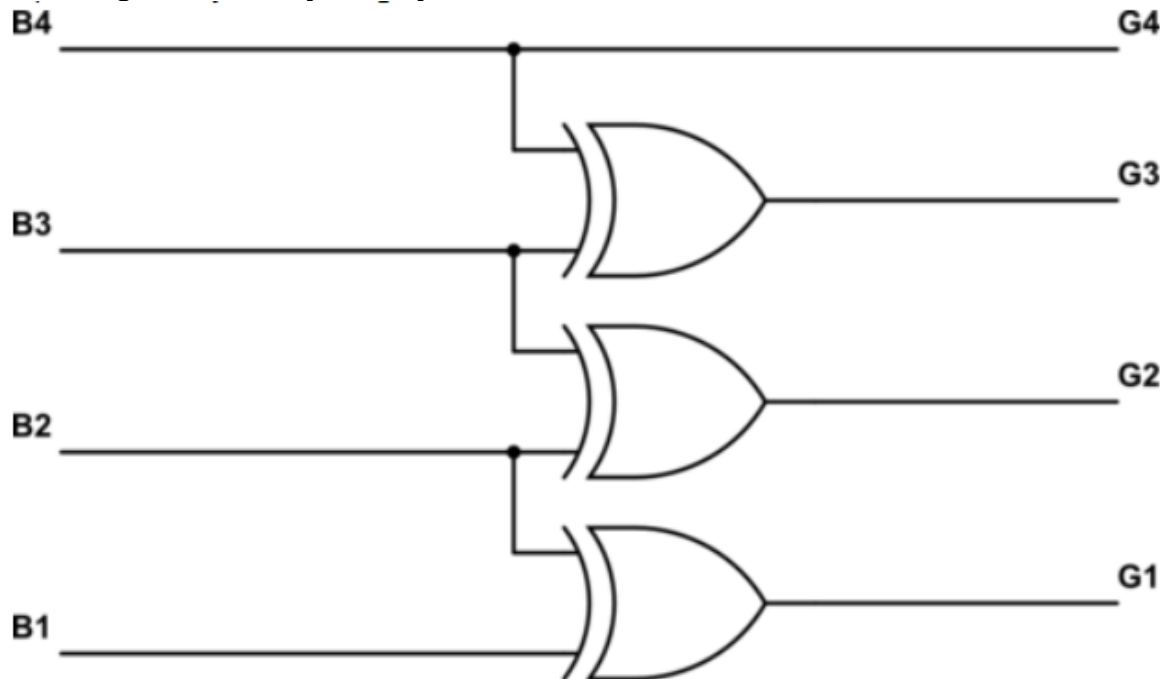
#75daysRTL

Binary Code is the basic representation of any number used Gray Code is a form of binary that uses a different method of incrementing from one number to the next. With Gray Code, only one bit changes state from one position to another. We are designing a basic 4-bit binary to grey Converter using **3 XOR Gates**.

Truth Table-

Decimal Number	Binary Code	Grey Code
0	0000	0000
1	0001	0001
2	0010	0011
3	0011	0010
4	0100	0110
5	0101	0111
6	0110	0101
7	0111	0100
8	1000	1100
9	1001	1101
10	1010	1111
11	1011	1110
12	1100	1010
13	1101	1011
14	1110	1001
15	1111	1000

Block Diagram of Binary to Grey Converter-



Verilog Code –

```
module binary_grey(input [3:0] binary, //binary input
    output [3:0] Grey //gray code output
);
```

```
//xor gates.
```

```
assign Grey[3] = binary[3];
assign Grey[2] = binary[3] ^ binary[2];
assign Grey[1] = binary[2] ^ binary[1];
assign Grey[0] = binary[1] ^ binary[0];
endmodule
```

TestBench Code-

```
module binary_grey_tb();
    wire [3:0]grey;
    reg [3:0]binary;

    binary_grey dut(binary,grey);
```

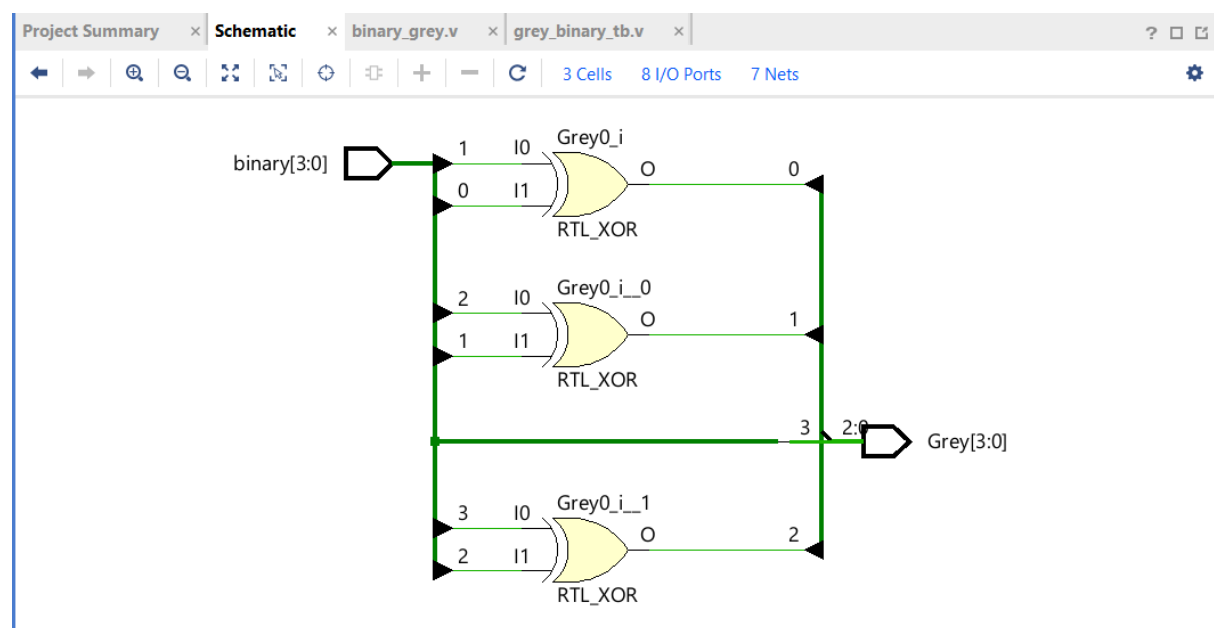
```

initial
begin
binary=4'b0000;
#20;
binary=4'b0100;
#20;
binary=4'b1001;
#20;
binary=4'b0110;
#20;
binary=4'b0111;
#20;
binary=4'b1111;
#20;
$finish;
end

```

endmodule

Schematic View of Binary to Grey Converter-



Simulation Result of Binary to Grey Converter -

