

EXPERIMENTT NO: 9

Title: - DESIGN AND IMPLEMENTATION OF
BINARY TO GRAY CODE CONVERTER

Objective:-

To design and implement 4-bit

- (i) Binary to gray code converter
- (ii) Gray to binary code converter

Tool required:-

1. SynaptiCAD Verilogger

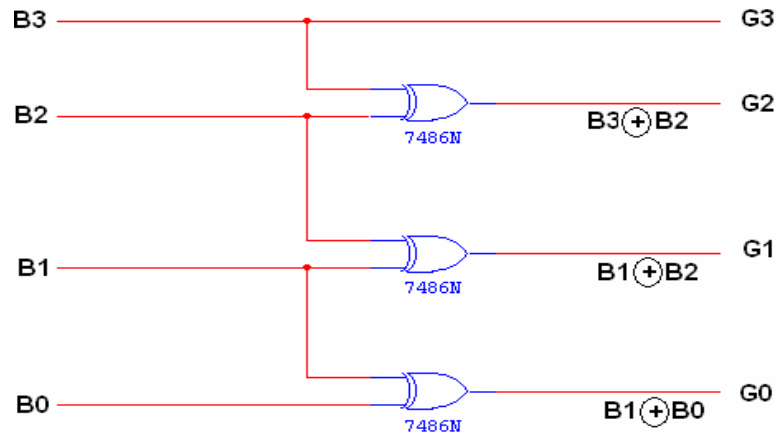
THEORY:

The availability of large variety of codes for the same discrete elements of information results in the use of different codes by different systems. A conversion circuit must be inserted between the two systems if each uses different codes for same information. Thus, code converter is a circuit that makes the two systems compatible even though each uses different binary code.

The bit combination assigned to binary code to gray code. Since each code uses four bits to represent a decimal digit. There are four inputs and four outputs. Gray code is a non-weighted code.

The input variable are designated as B3, B2, B1, B0 and the output variables are designated as G3, G2, G1, Go. from the truth table, combinational circuit is designed. The Boolean functions are obtained from K-Map for each output variable.

LOGIC DIAGRAM:
BINARY TO GRAY CODE CONVERTOR



K-Map for G_3 :

		B1B0			
		00	01	11	10
B3B2	00				
	01				
	11	1	1	1	1
	10	1	1	1	1

$$G_3 = B_3$$

K-Map for G_2 :

		B1B0			
		00	01	11	10
B3B2	00				
	01	1	1	1	1
	11				
	10	1	1	1	1

$$G_2 = B_3 \oplus B_2$$

K-Map for G_1 :

		B1B0			
		00	01	11	10
B3B2	00			1	1
	01	1	1		
	11	1	1		
	10			1	1

$$G_1 = B_1 \oplus B_2$$

K-Map for G_0 :

		B1B0			
		00	01	11	10
B3B2	00		1		1
	01		1		1
	11		1		1
	10		1		1

$$G_0 = B_1 \oplus B_0$$

TRUTH TABLE:

Binary input	Gray code output
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B3	B2	B1	B0	G3	G2	G1	G0
0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	1
0	0	1	0	0	0	1	1
0	0	1	1	0	0	1	0
0	1	0	0	0	1	1	0
0	1	0	1	0	1	1	1
0	1	1	0	0	1	0	1
0	1	1	1	0	1	0	0
1	0	0	0	1	1	0	0
1	0	0	1	1	1	0	1
1	0	1	0	1	1	1	1
1	0	1	1	1	1	1	0
1	1	0	0	1	0	1	0
1	1	0	1	1	0	1	1
1	1	1	0	1	0	0	1
1	1	1	1	1	0	0	0

TASK:

1. Implement Binary to Gray code Converter using Verilog
 - a. Draw the diagram with the labels used in Verilog
 - b. Paste the Screenshot of the code
 - c. Paste the screenshot of the time diagram