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Exp: 3

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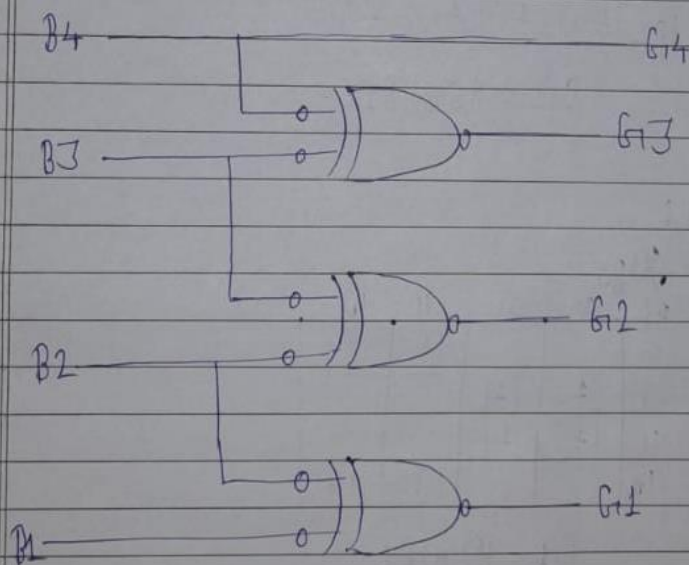
Aim: Design and implementation of 4 Bit Binary to Gray code and gray to Binary code

Component: IC 7486

Apparatus: Power supply, wires, probes, etc

Theory: Gray code is non-weighted code. It is not an arithmetic code. It has a very special feature that only one bit in the gray code will change, each time the decimal number is incremented. The gray code is cyclic code is also exhibits the reflective property.

★ Binary to Gray code



K-Map for G_3 :

B₃B₂ \ B ₁ B ₀	00	01	11	10
00				
01				
11	1	1	1	1
10	1	1	1	1

$$G_3 = B_3$$

K-Map for G_2 :

B₃B₂ \ B ₁ B ₀	00	01	11	10
00				
01	1	1	1	1
11				
10	1	1	1	1

$$G_2 = B_3 \oplus B_2$$

K-Map of G_1 :

B₃B₂ \ B ₁ B ₀	00	01	11	10
00			1	1
01	1	1		
11	1	1		
10			1	1

$$G_1 = B_2 \oplus B_1$$

K-Map for G_0 :

		$B_1 B_0$			
		00	01	11	10
$B_3 B_2$	00		1		1
	01		1		1
	11		1		1
	10		1		1

$$G_0 = B_1 \oplus B_0$$

Truth Table:

B_3	B_2	B_1	B_0	G_3	G_2	G_1	G_0
0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	1
0	0	1	0	0	0	1	0
0	0	1	1	0	0	1	1
0	1	0	0	0	1	0	0
0	1	0	1	0	1	0	1
0	1	1	0	0	1	1	0
0	1	1	1	0	1	1	1
1	0	0	0	1	0	0	0
1	0	0	1	1	0	0	1
1	0	1	0	1	0	1	0
1	0	1	1	1	0	1	1
1	1	0	0	1	1	0	0
1	1	0	1	1	1	0	1
1	1	1	0	1	1	1	0
1	1	1	1	1	1	1	1

K-Map for B2:

$G_1 G_0 \backslash G_3 G_2$		00	01	11	10
00	00	0	1	0	1
01	01	0	1	0	1
11	11	0	1	0	1
10	10	0	1	0	1

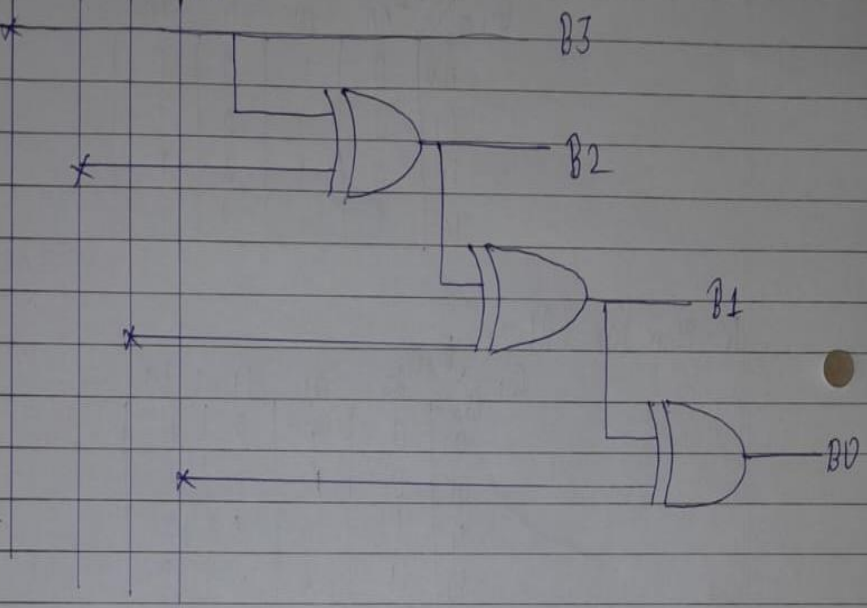
K-Map for B1:

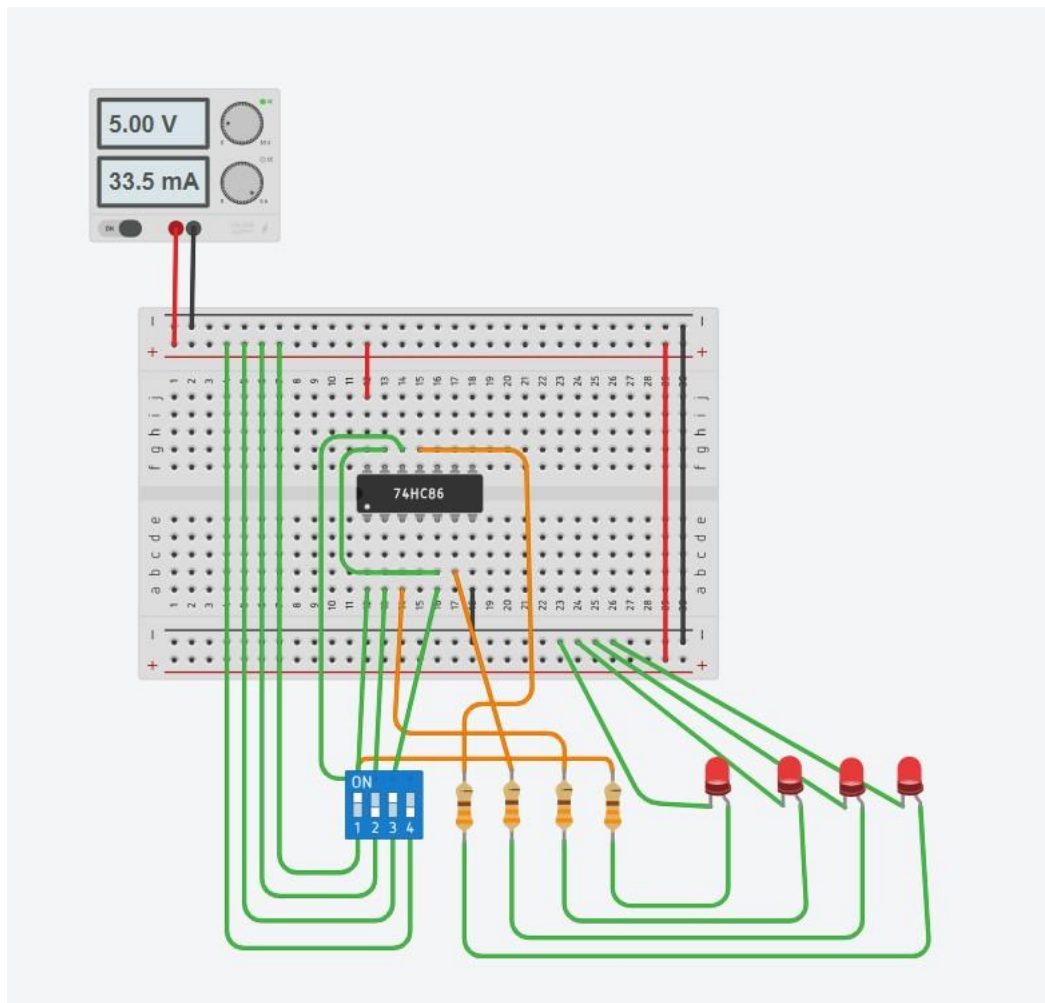
$G_1 G_0 \backslash G_3 G_2$		01	11	10
00	00	0	1	0
01	01	0	1	0
11	11	1	0	1
10	10	1	0	1

K-Map for B0:

$G_1 G_0 \backslash G_3 G_2$		00	01	11	10
00	00	0	1	0	1
01	01	1	0	1	0
11	11	0	1	0	1
10	10	1	0	1	0

Symbol: G_2 G_1 G_0
 G_3 *





B to G Converter



G to B Cinverter