Universidad Rafael Landívar
Tradición Jesuita en Guatemala

Matemática Discreta I

Ing. Juan Carlos Soto

DIVISIÓN BINARIA

PROYECTO: DISEÑO DEL CIRCUITO

Williams Gilberto Alfredo Ruano Calderón (1281414)

Byron Víctor Hugo Morales Lemus (1320114)

Francisco Josué Solís Ruano (1050014)

Maria Reneé Palma Avala (1024414)


Primera Parte
NÚMEROS HEXADECIMALES EN EL DISPLAY
DIVISIÓN BINARIA

- *Tabla de Entradas: Binario (0 al 15) a Salidas: Hexadecimal (0 a F)*

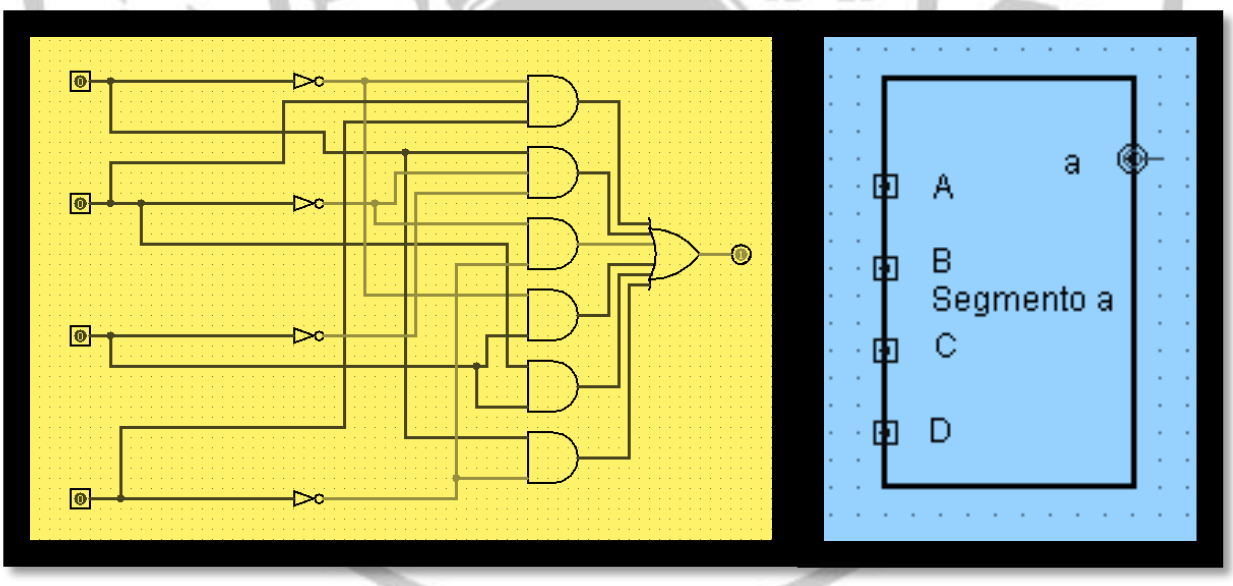
#	ENTRADAS				SALIDAS						
No.	D	C	B	A	a	b	c	d	e	f	G
0	0	0	0	0	1	1	1	1	1	1	0
1	0	0	0	1	0	1	1	0	0	0	0
2	0	0	1	0	1	1	0	1	1	0	1
3	0	0	1	1	1	1	1	1	0	0	1
4	0	1	0	0	0	1	1	0	0	1	1
5	0	1	0	1	1	0	1	1	0	1	1
6	0	1	1	0	1	0	1	1	1	1	1
7	0	1	1	1	1	1	1	0	0	0	0
8	1	0	0	0	1	1	1	1	1	1	1
9	1	0	0	1	1	1	1	0	0	1	1
10	1	0	1	0	1	1	1	0	1	1	1
11	1	0	1	1	0	0	1	1	1	1	1
12	1	1	0	0	1	0	0	1	1	1	0
13	1	1	0	1	0	1	1	1	1	0	1
14	1	1	1	0	1	0	0	1	1	1	1
15	1	1	1	1	1	0	0	0	1	1	1

1. DISPLAY "A":

Kamaugh map

	00	01	11	10
00	1 0	0 1	1 3	1 2
01	0 4	1 5	1 7	1 6
11	1 12	0 13	1 15	1 14
10	1 8	1 9	0 11	1 10

a = (¬ABD) + (A¬B¬C) + (¬B¬D) + (¬AC) + (BC) + (A¬D)

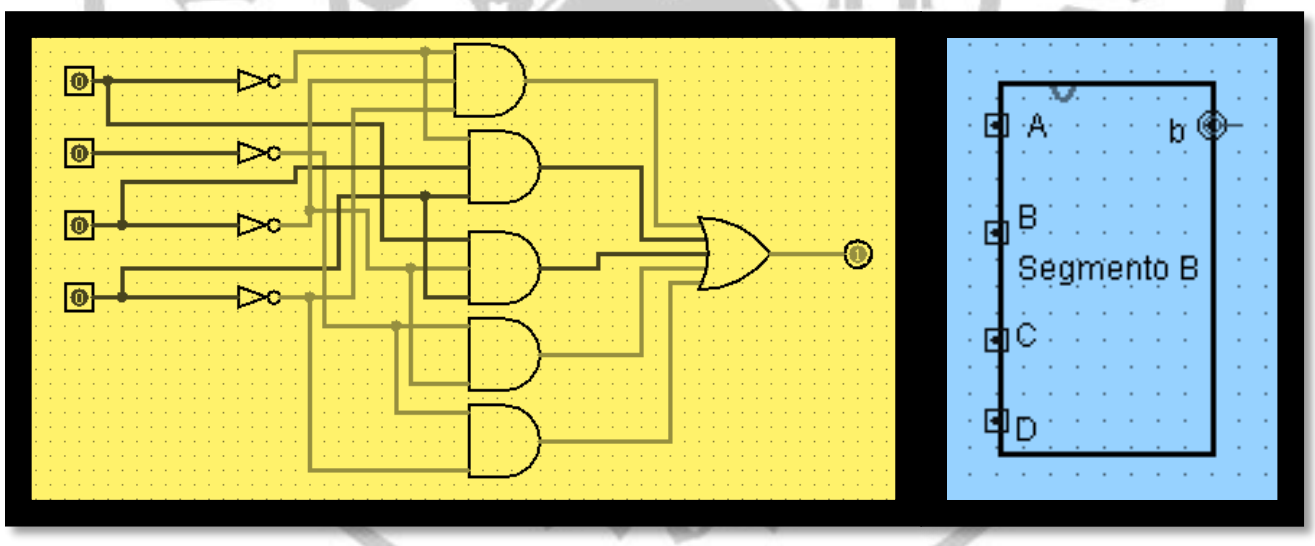


2. DISPLAY “B”:

Kamaugh map

	00	01	11	10
00	1 0	1 1	1 3	1 2
01	1 4	0 5	1 7	0 6
11	0 12	1 13	0 15	0 14
10	1 8	1 9	0 11	1 10

b = (¬A¬C¬D) + (¬ACD) + (A¬CD) + (¬B¬C) + (¬B¬D)

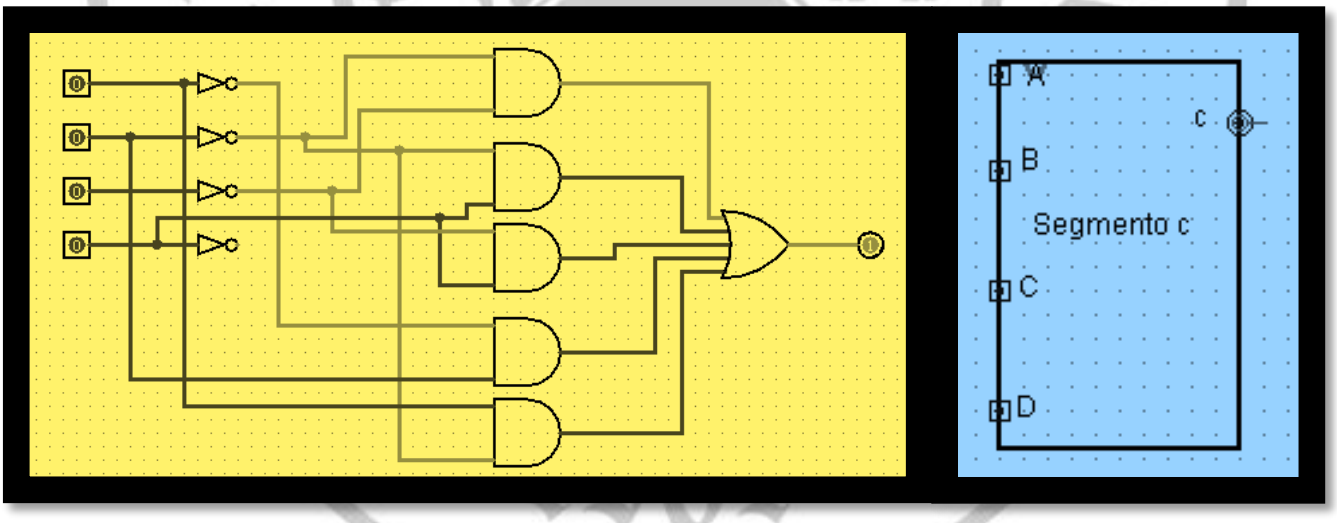


3. DISPLAY "C":

Kamaugh map

	00	01	11	10
00	1 0	1 1	1 3	0 2
01	1 4	1 5	1 7	1 6
11	0 12	1 13	0 15	0 14
10	1 8	1 9	1 11	1 10

c = (¬B¬C) + (¬BD) + (¬CD) + (¬AB) + (A¬B)

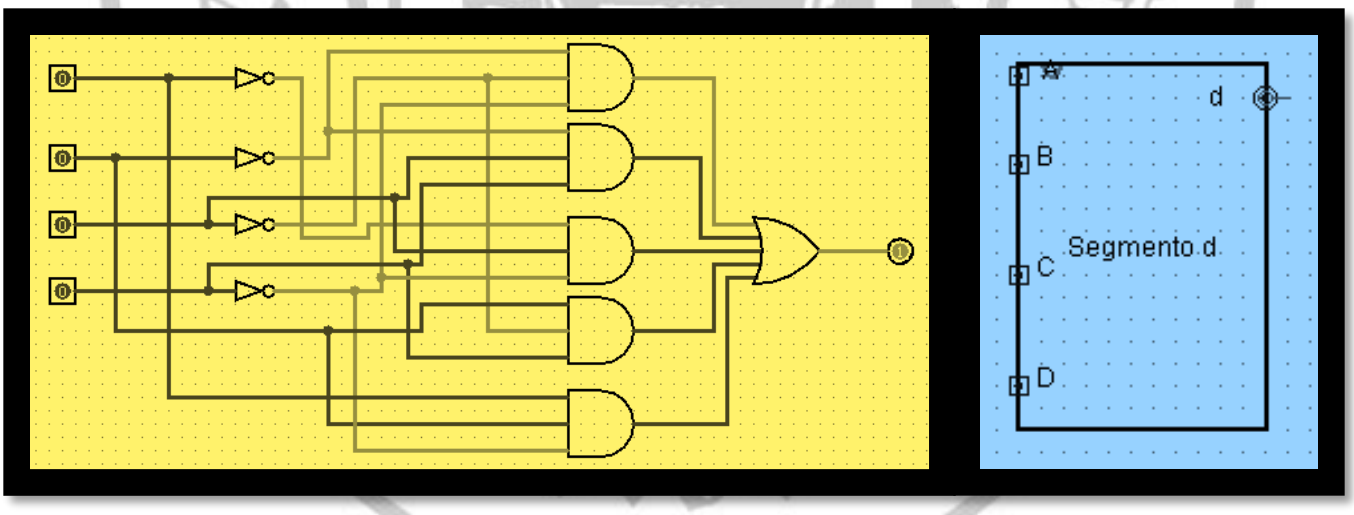


4. DISPLAY “D”:

Kamaugh map

	00	01	11	10
00	1 0	0 1	1 3	1 2
01	0 4	1 5	0 7	1 6
11	1 12	1 13	0 15	1 14
10	1 8	0 9	1 11	0 10

d = (¬B¬C¬D) + (¬BCD) + (¬AC¬D) + (B¬CD) + (AB¬D)

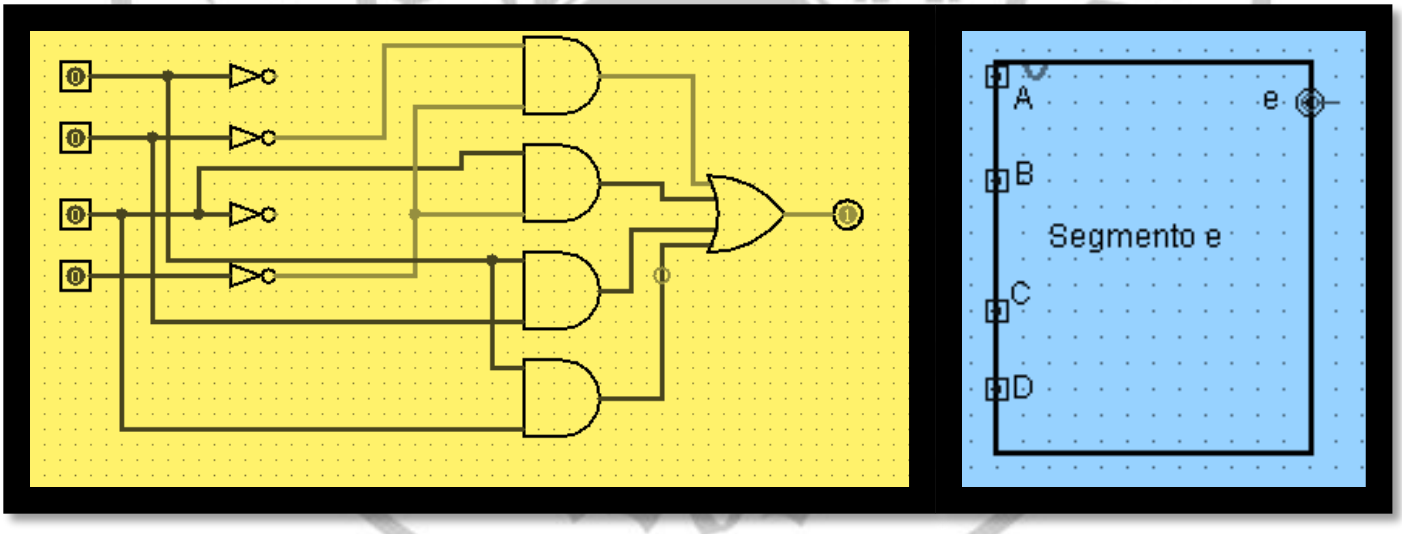


5. *DISPLAY "E":*

Kamaugh map

	00	01	11	10
00	1 0	0 1	0 3	1 2
01	0 4	0 5	0 7	1 6
11	1 12	1 13	1 15	1 14
10	1 8	0 9	1 11	1 10

e = (¬B¬D) + (C¬D) + (AB) + (AC)

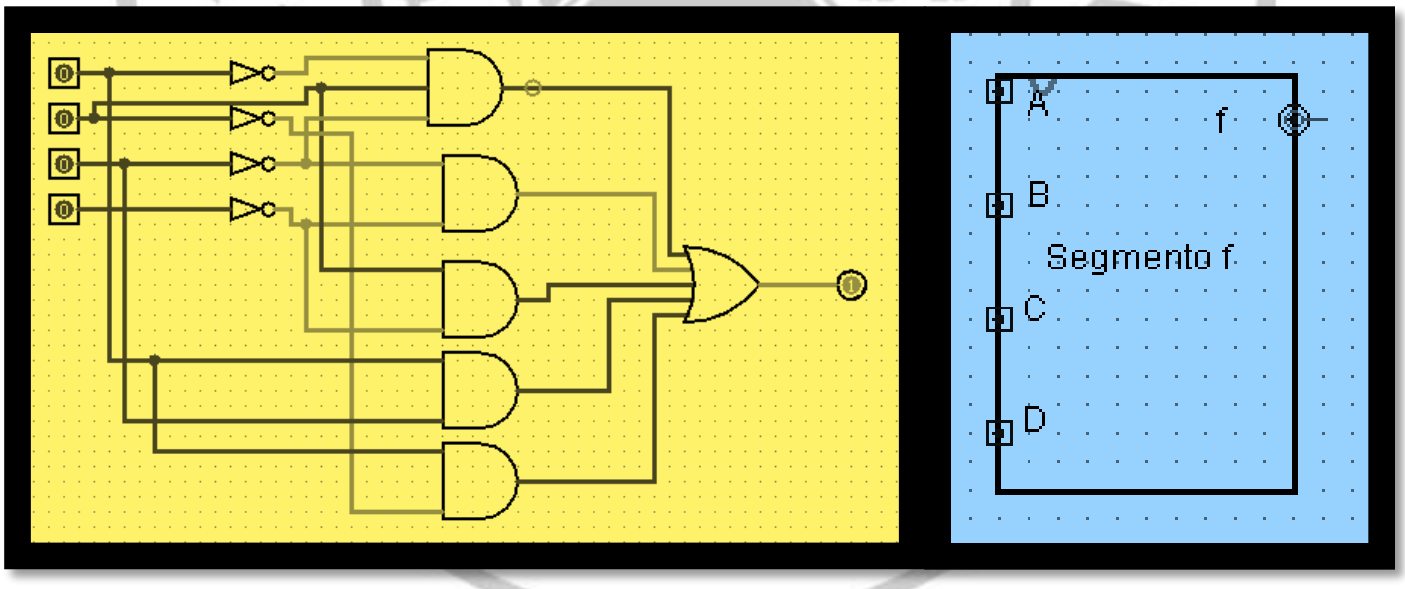


6. DISPLAY “F”:

Kamaugh map

	00	01	11	10
00	1 0	0 1	0 3	0 2
01	1 4	1 5	0 7	1 6
11	1 12	0 13	1 15	1 14
10	1 8	1 9	1 11	1 10

f = (¬AB¬C) + (¬C¬D) + (B¬D) + (AC) + (A¬B)

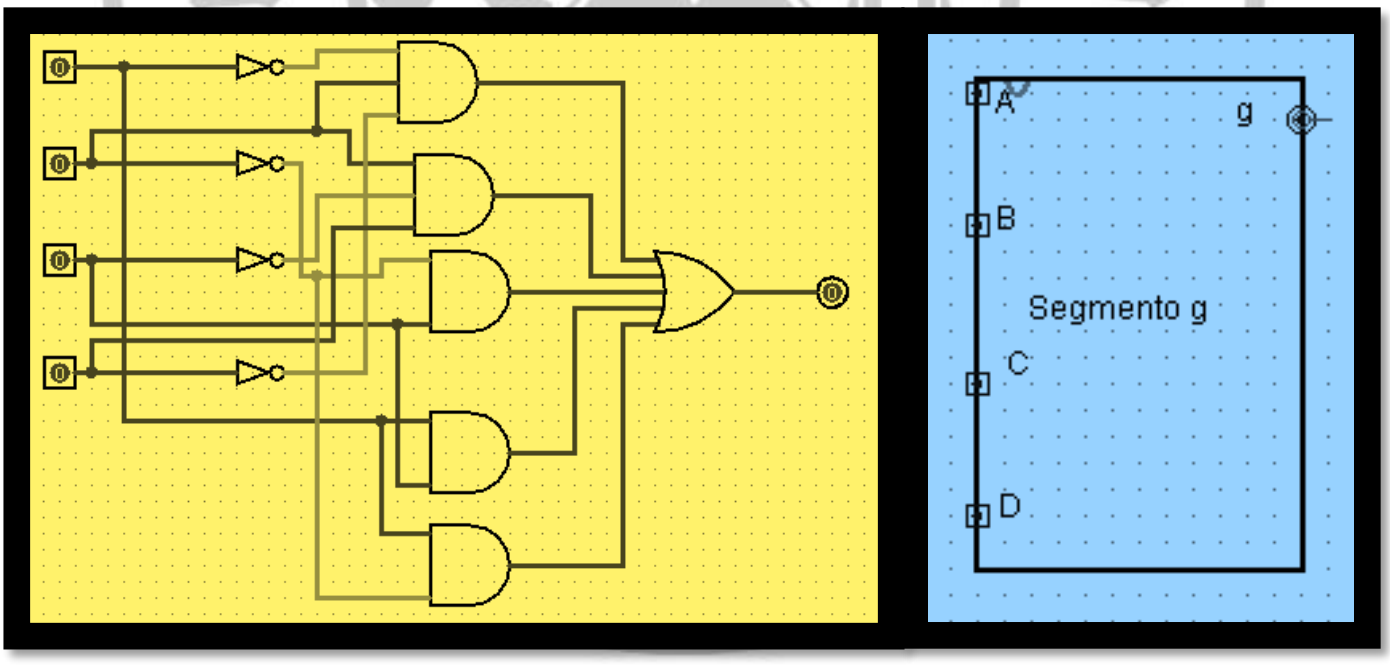


7. DISPLAY "G":

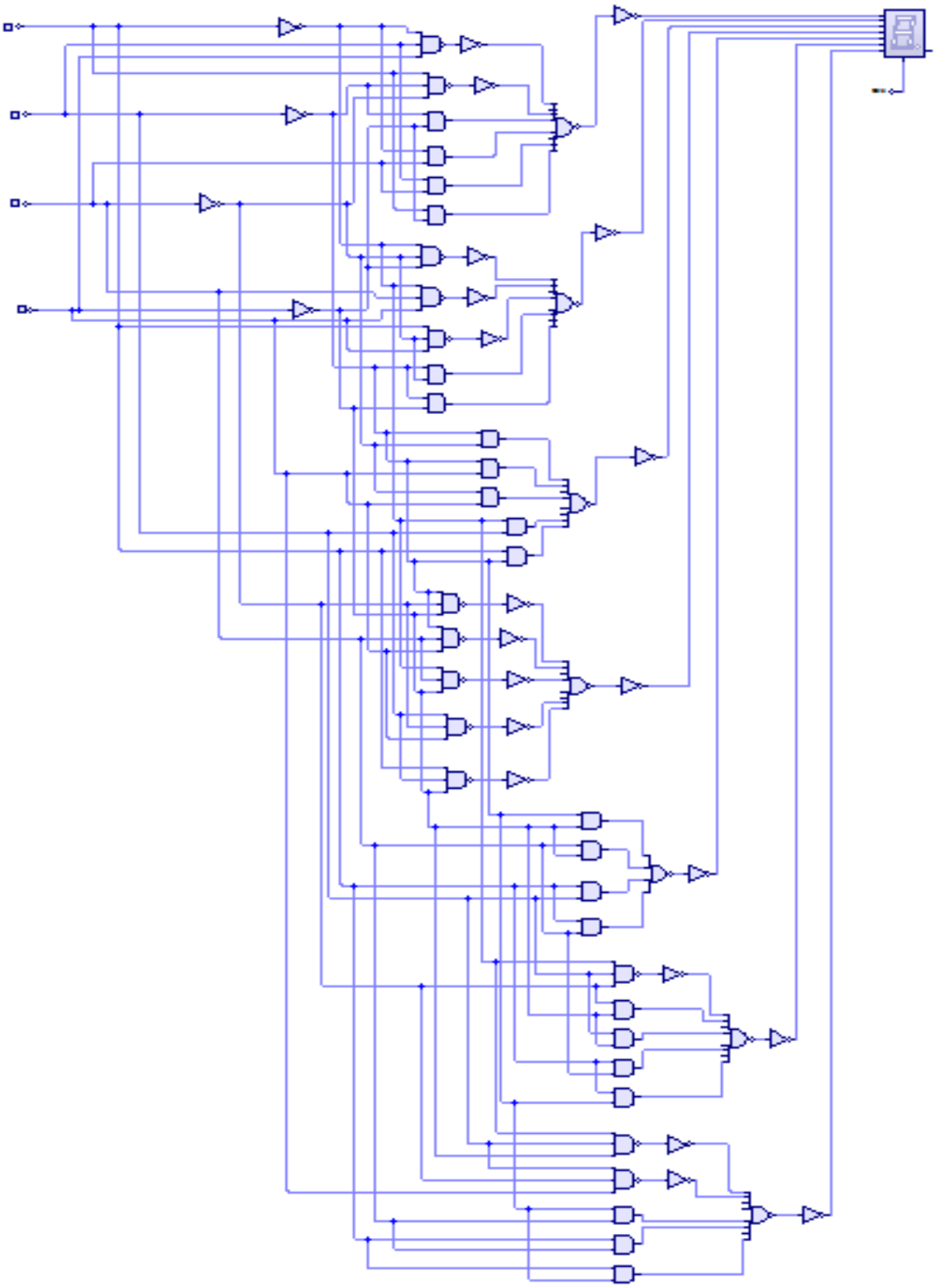
Kamaugh map

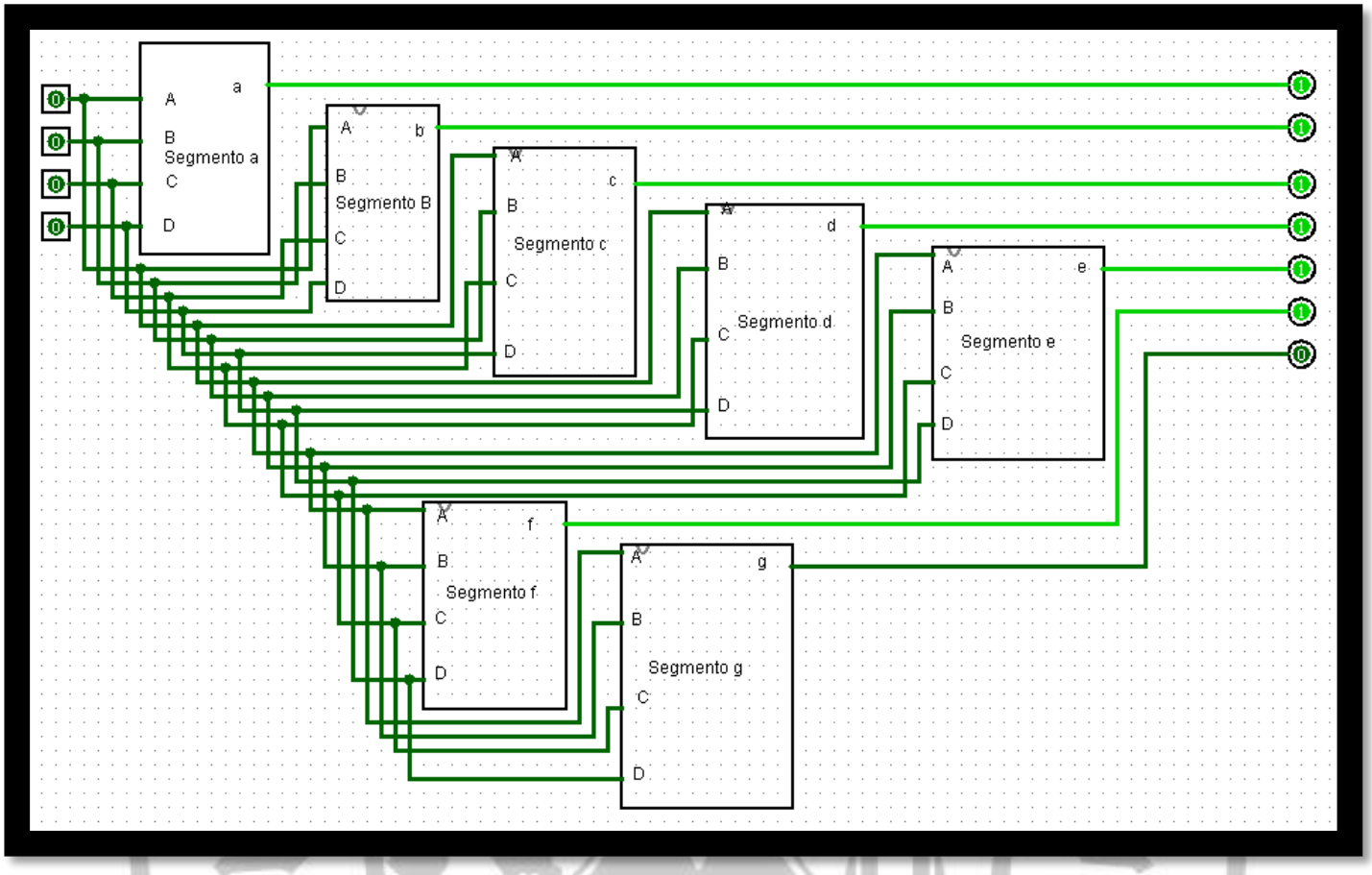
	00	01	11	10
00	0 0	0 1	1 3	1 2
01	1 4	1 5	0 7	1 6
11	0 12	1 13	1 15	1 14
10	1 8	1 9	1 11	1 10

g = (¬AB¬D) + (B¬CD) + (¬BC) + (AC) + (A¬B)



- *Circuito de 4 entradas y 7 salidas. (Representa los números del 0 al F en el Display)*




A
B
Segmento a
C
D
a
A
B
Segmento B
C
D
b
A
B
Segmento c
C
D
c
A
B
Segmento d
C
D
d
A
B
Segmento e
C
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e
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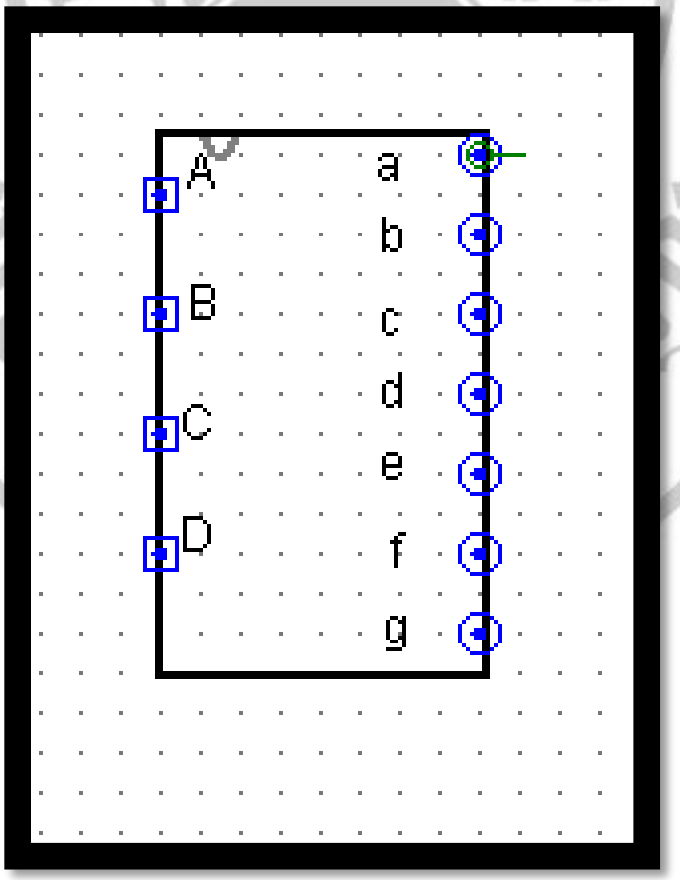
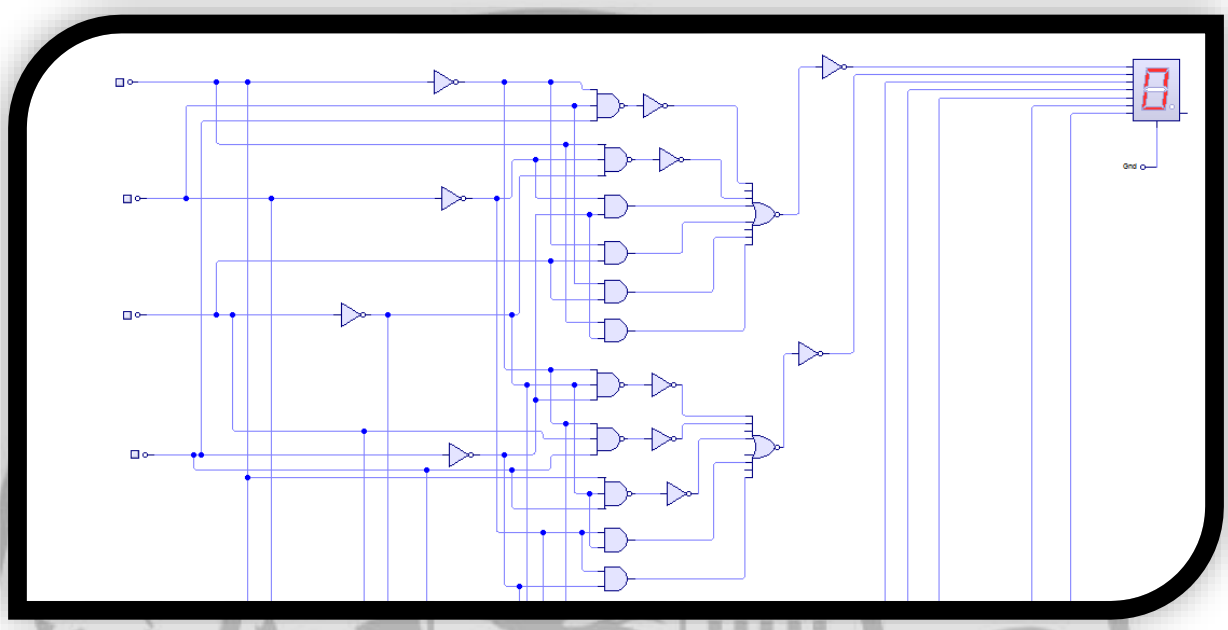
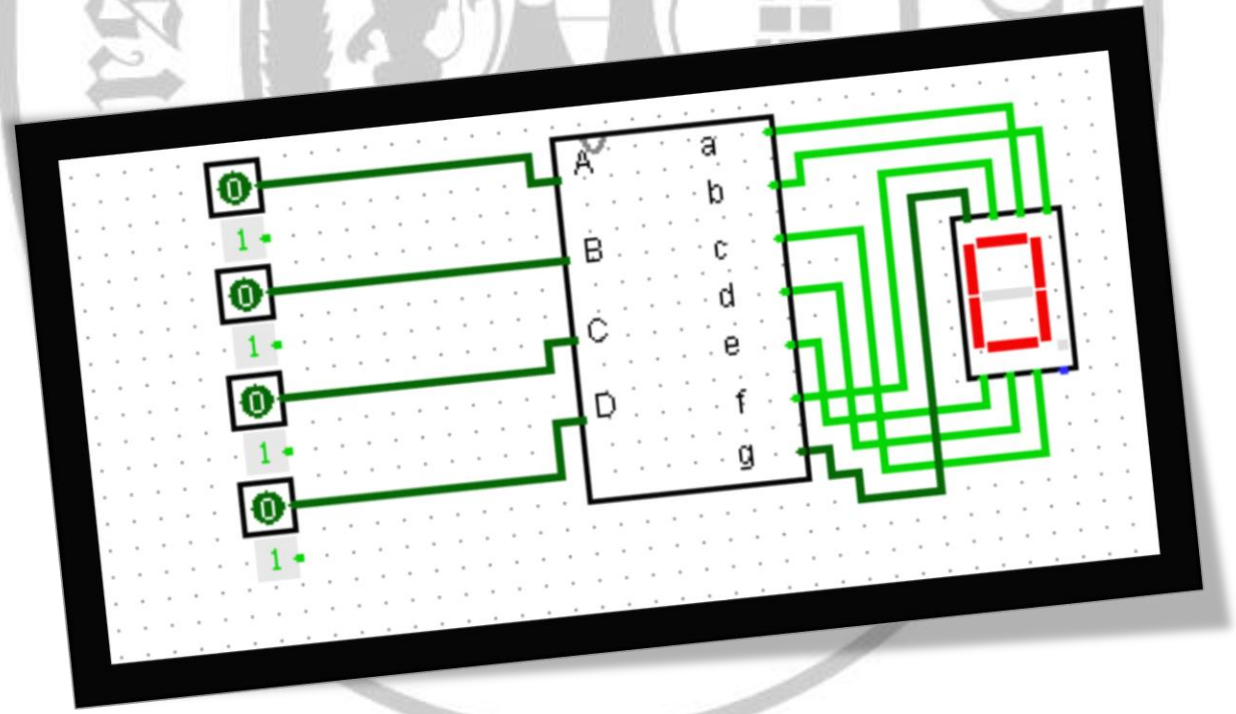
B
Segmento f
C
D
f
A
B
Segmento g
C
D
g


A
B
C
D
a
b
c
d
e
f
g

✓ *Número 0:*





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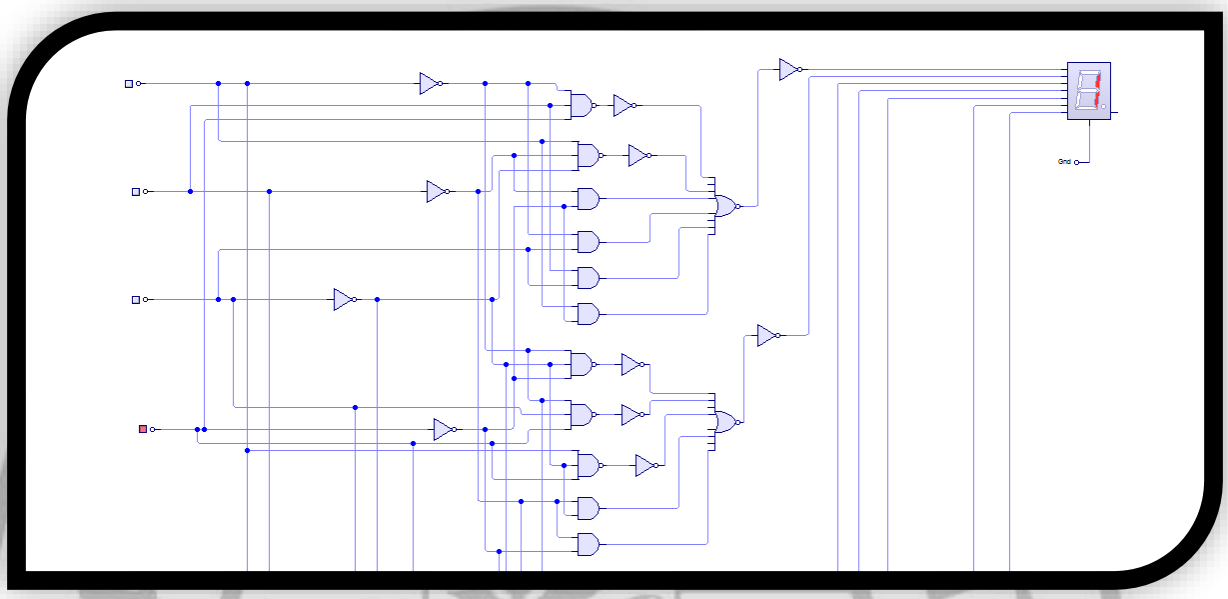

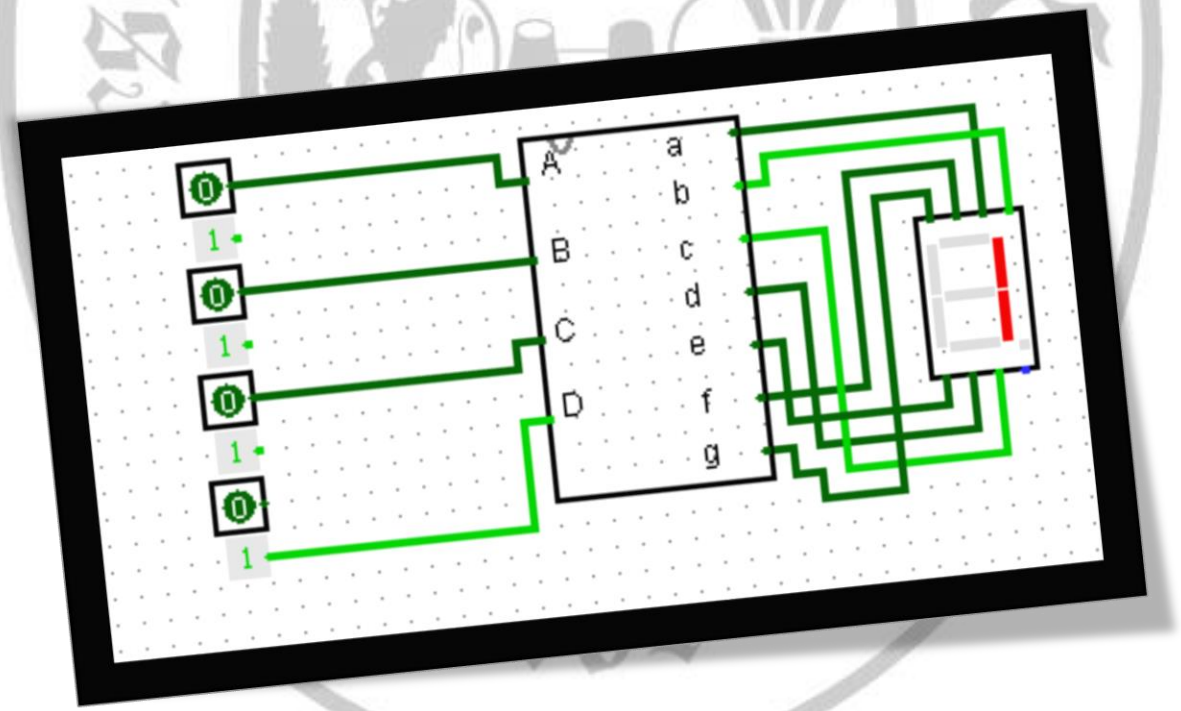

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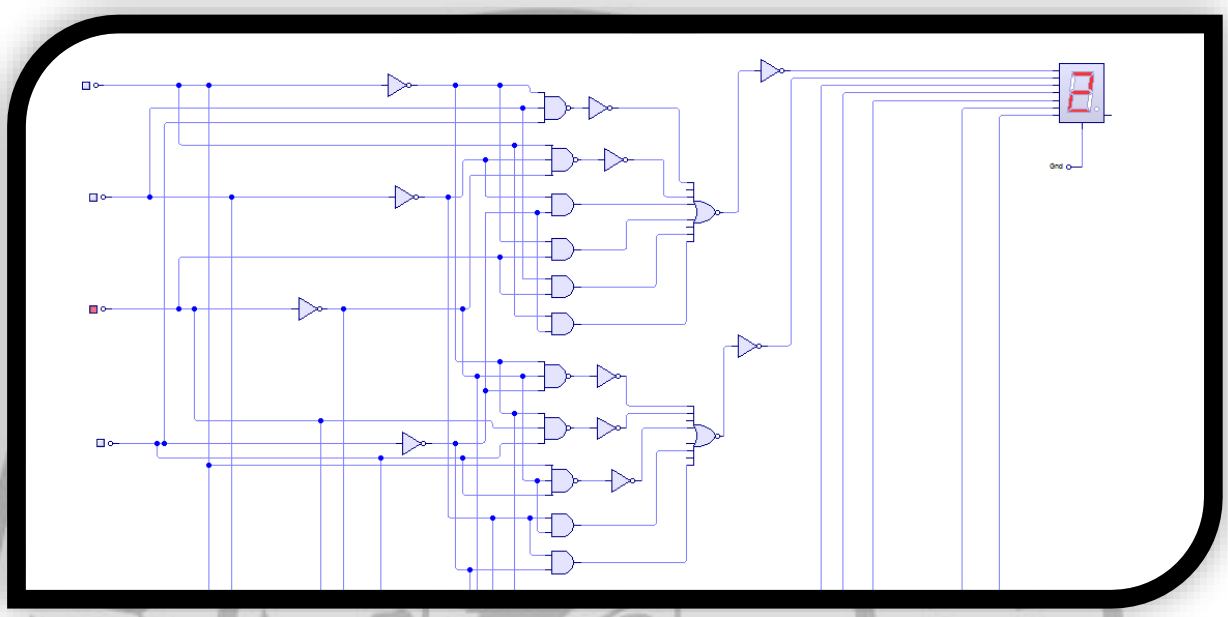

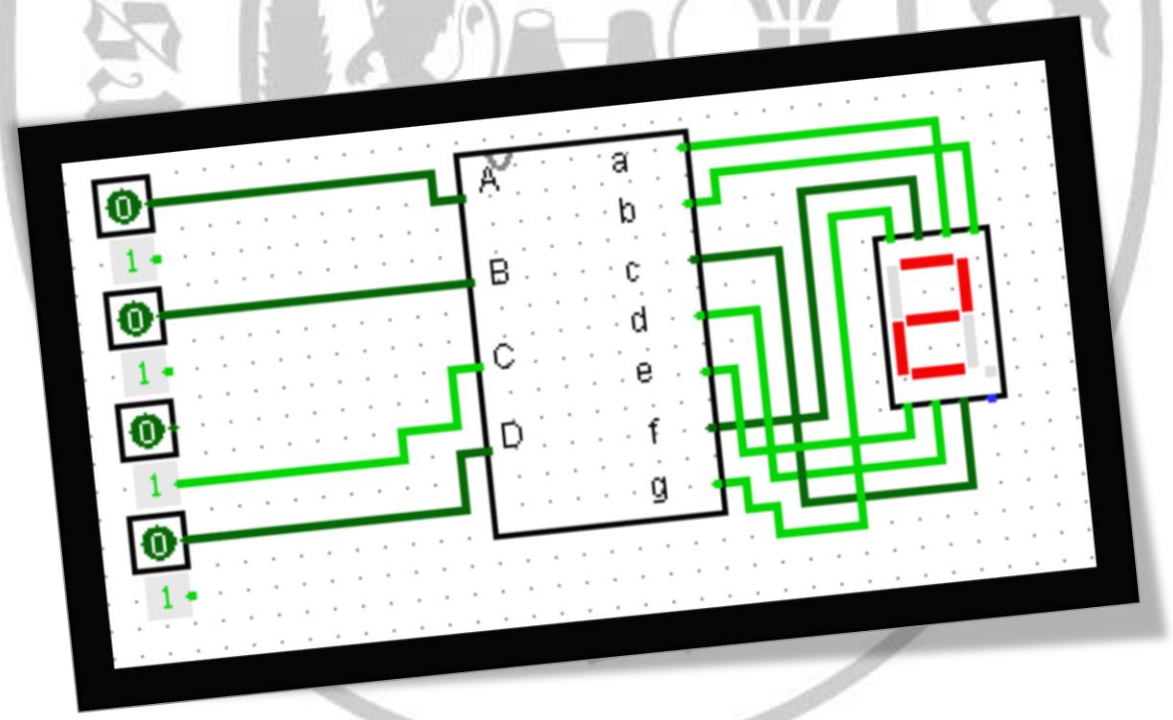

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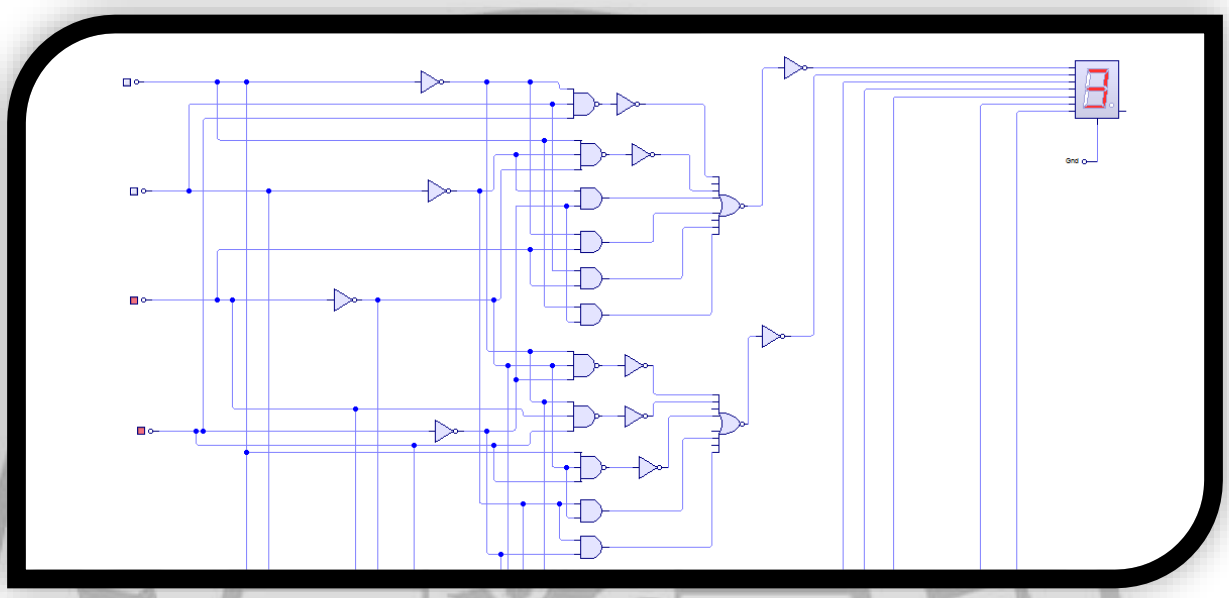

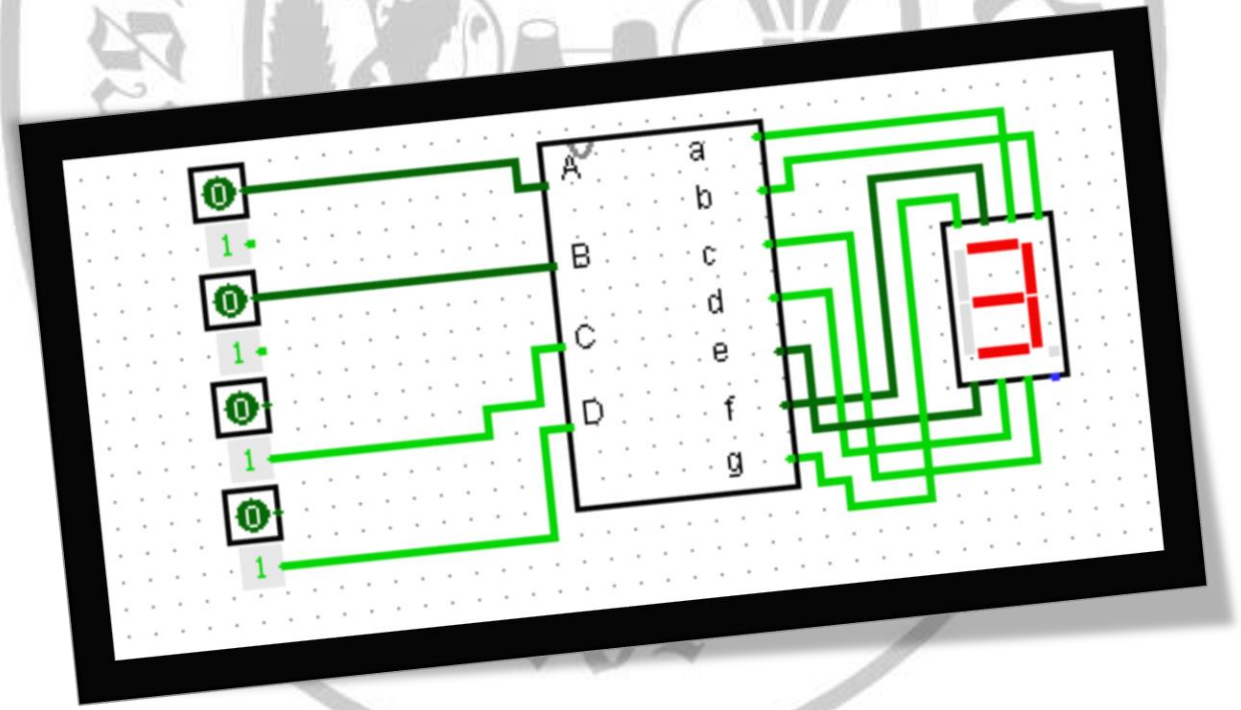

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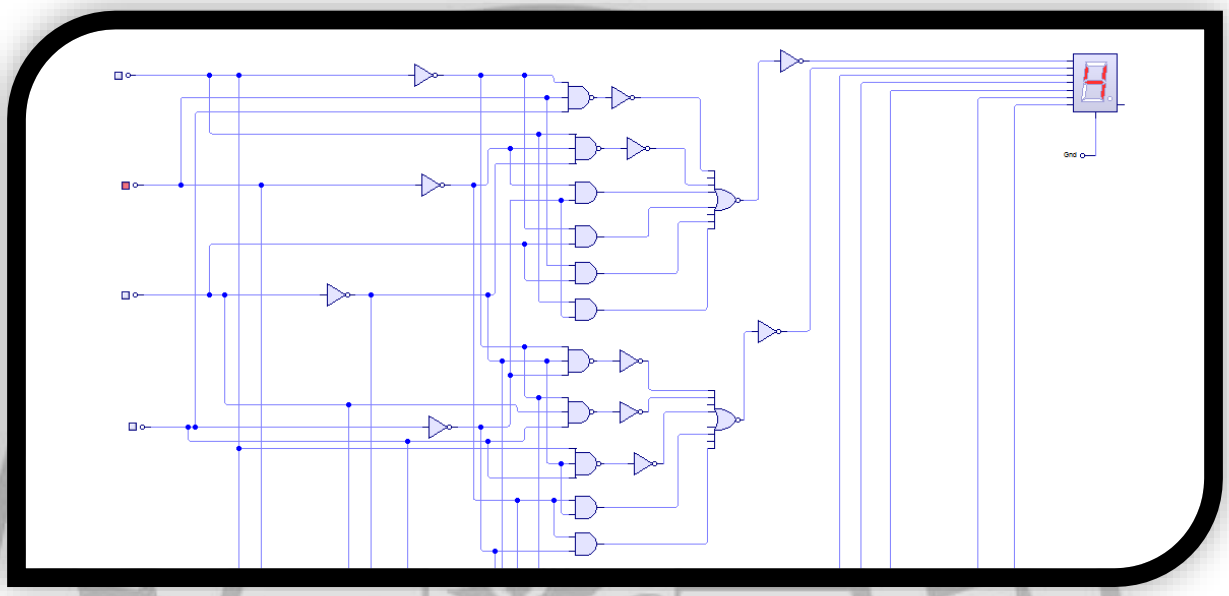

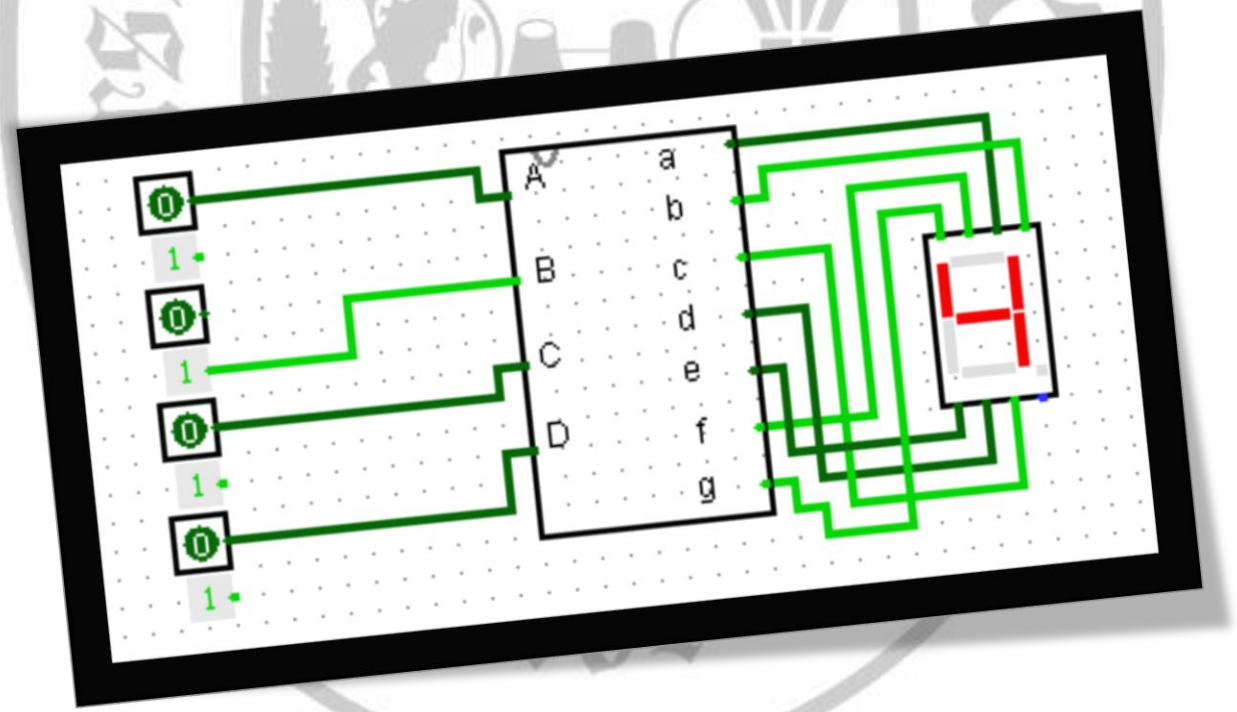

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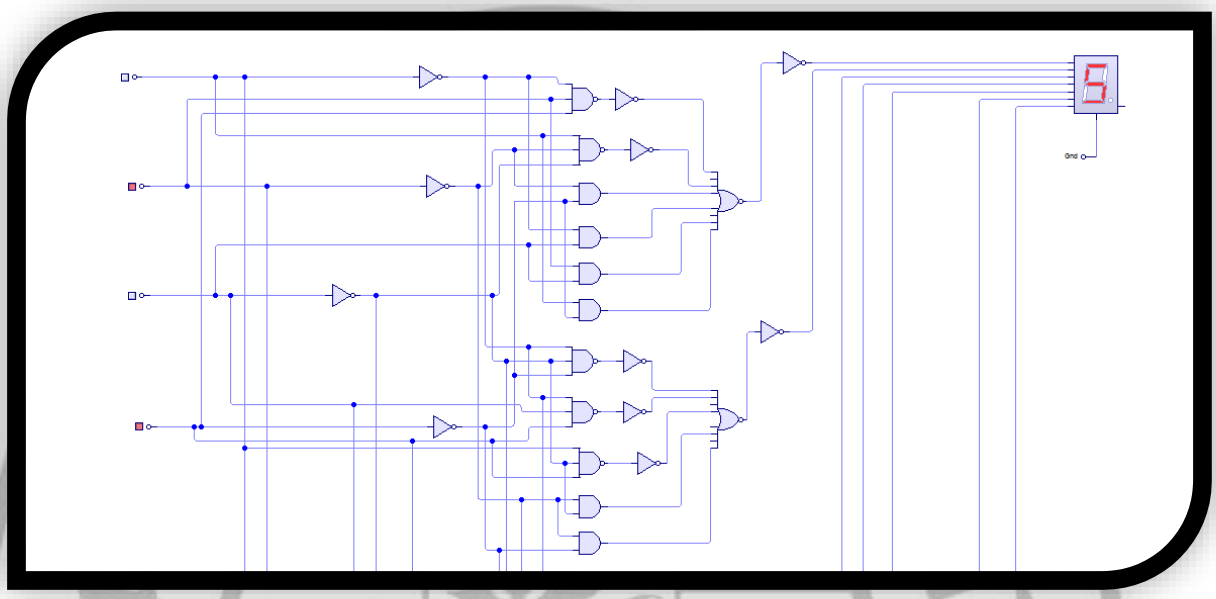

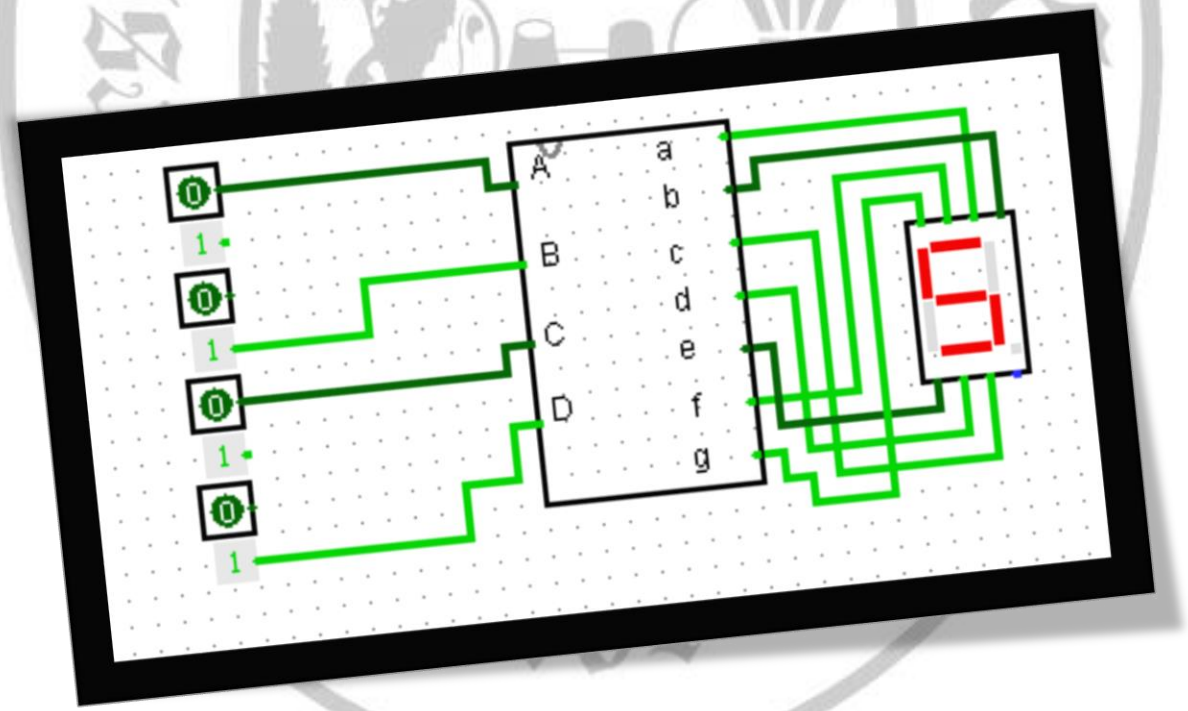

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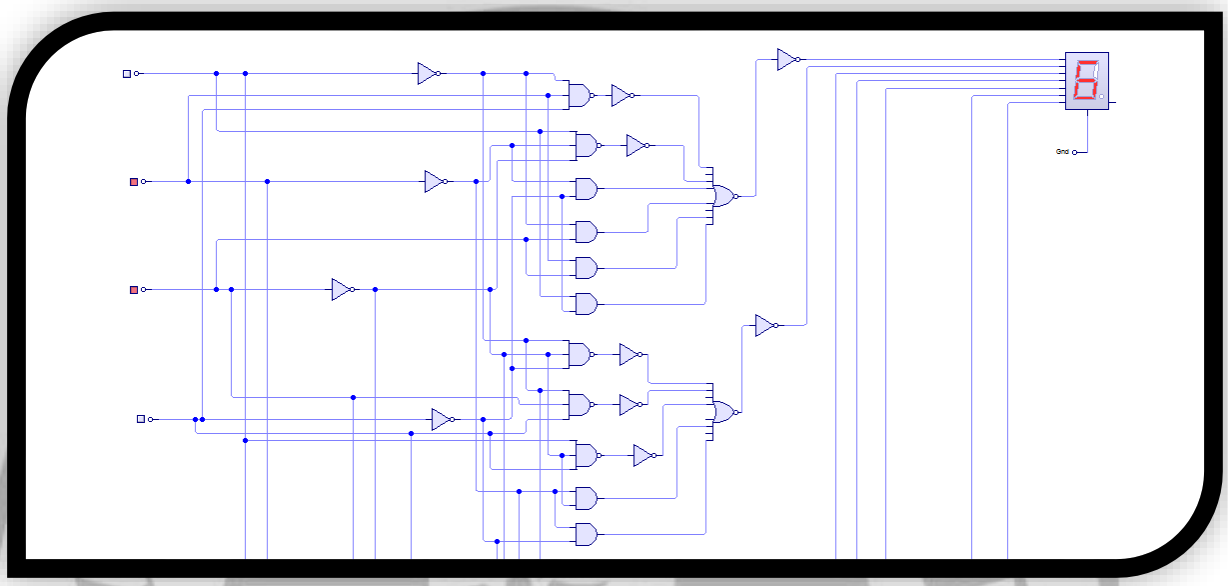
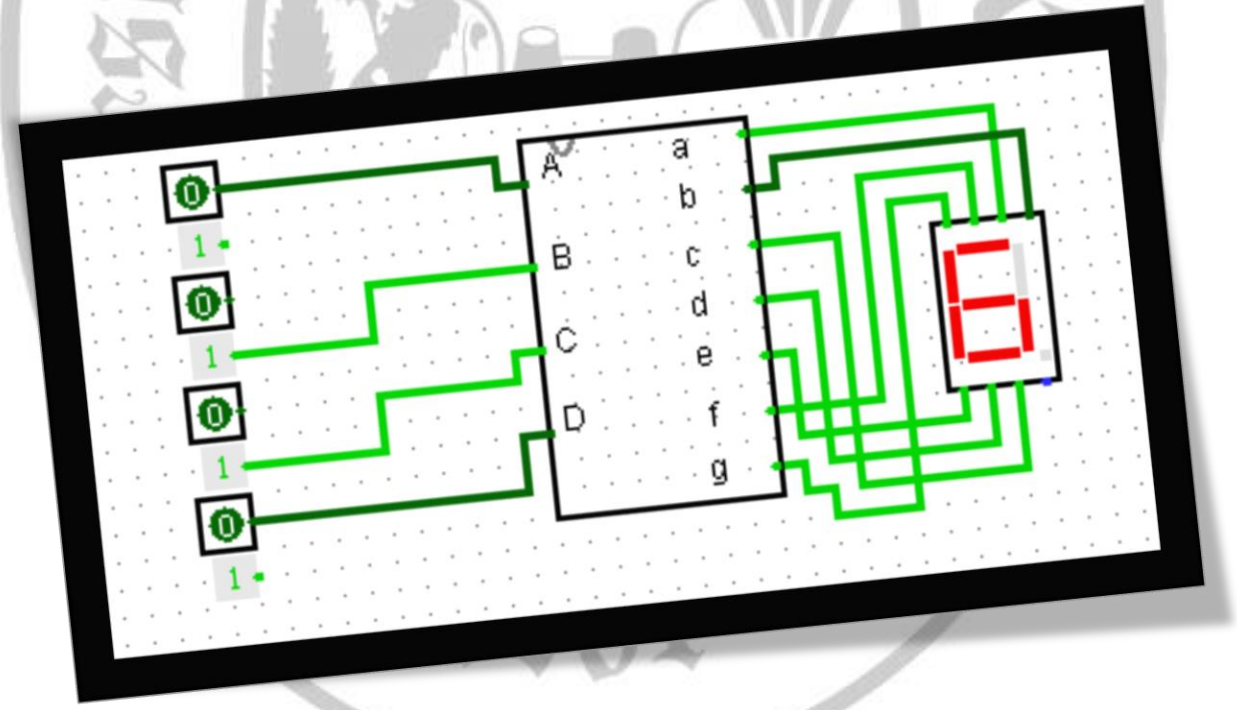
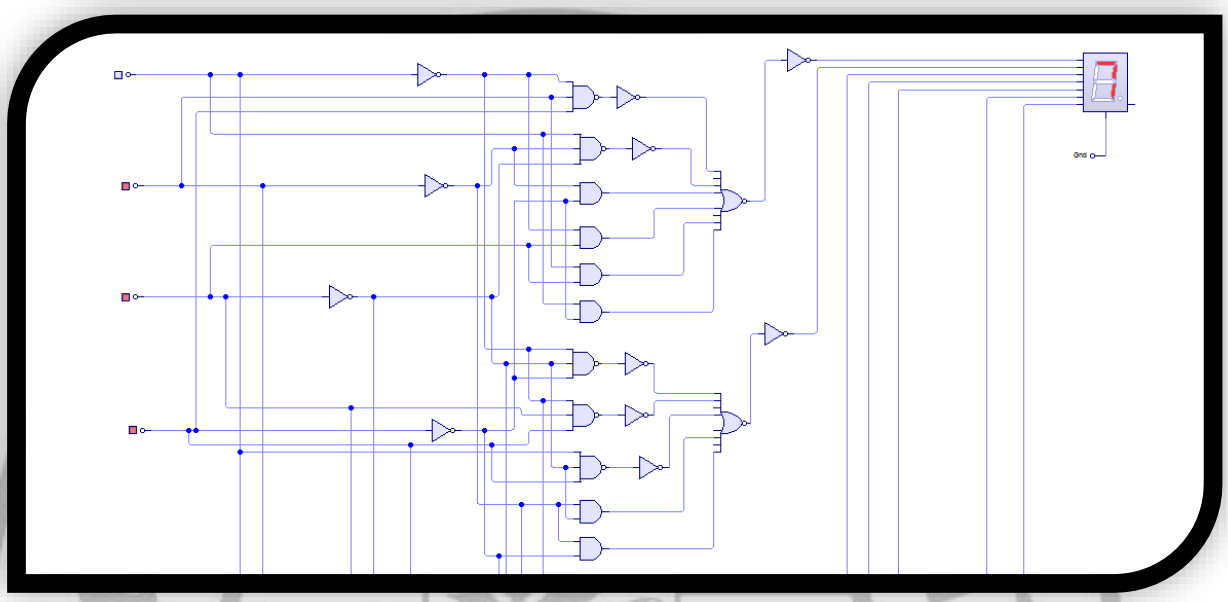
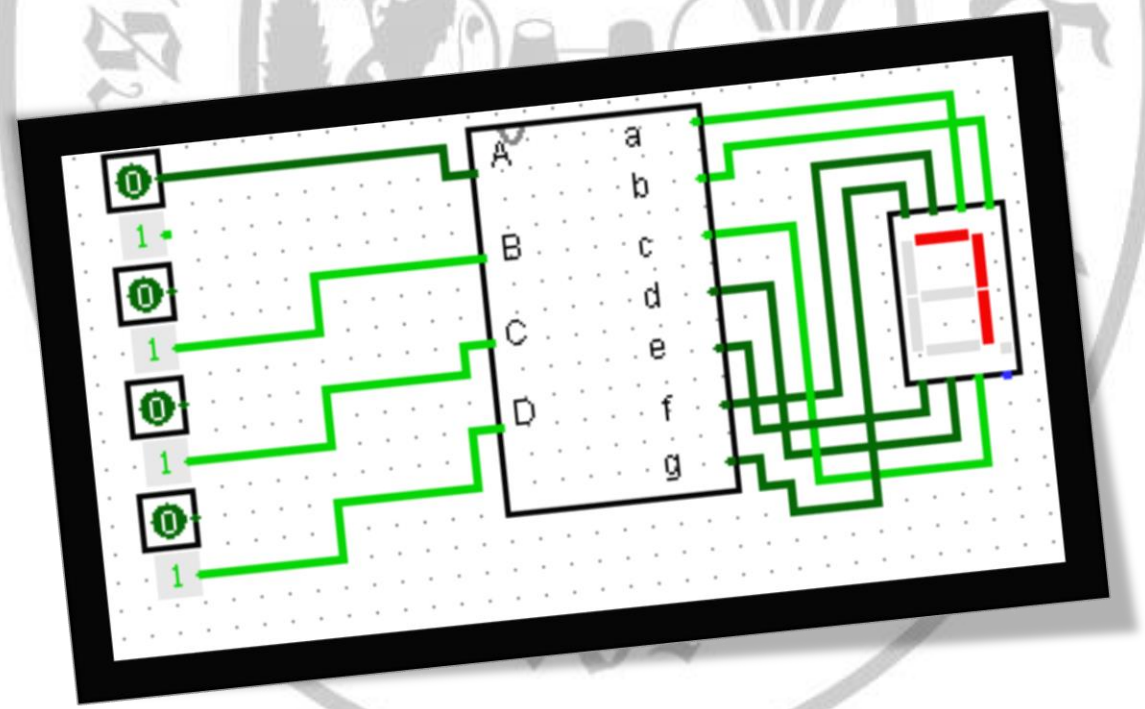




✓ *Número 7:*





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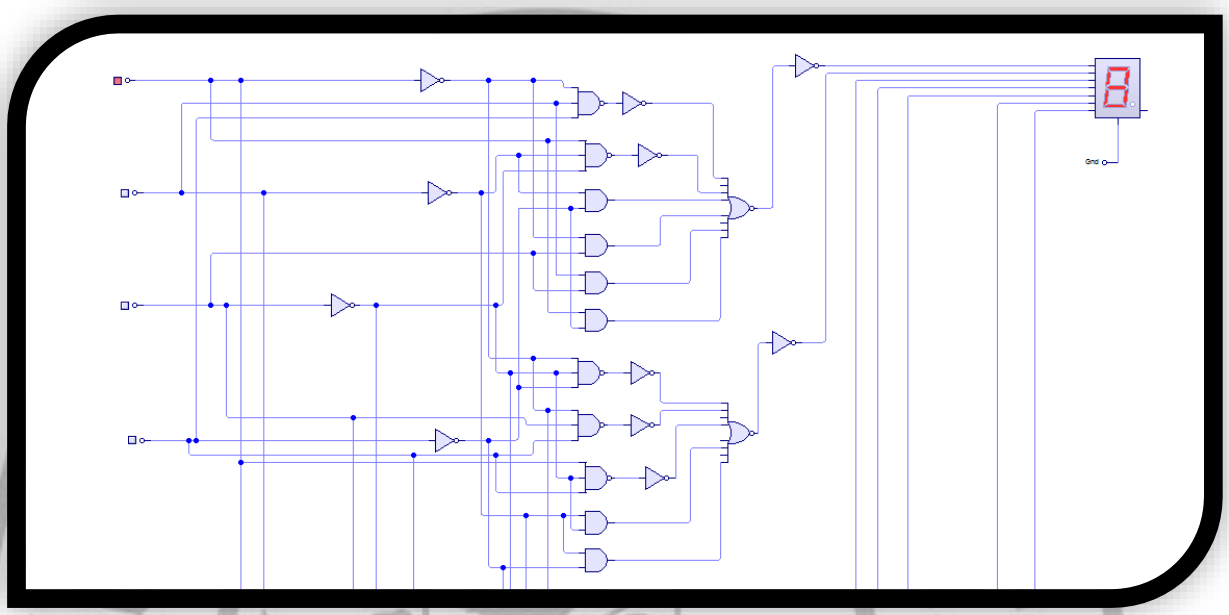

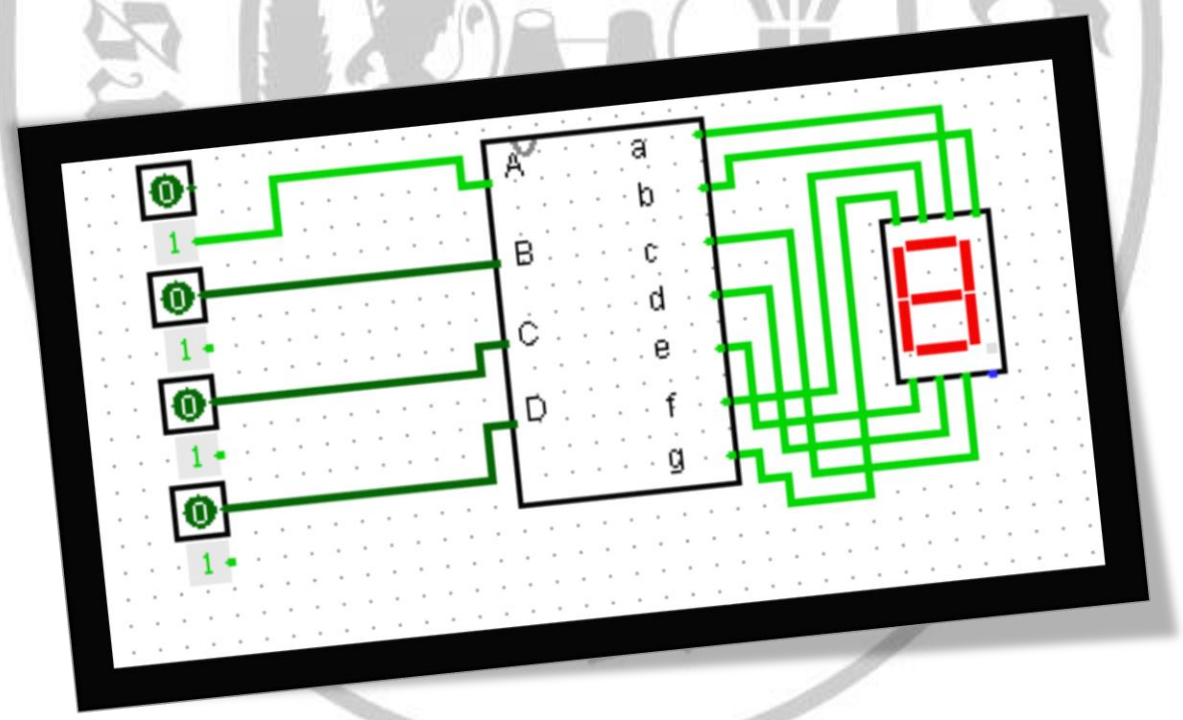

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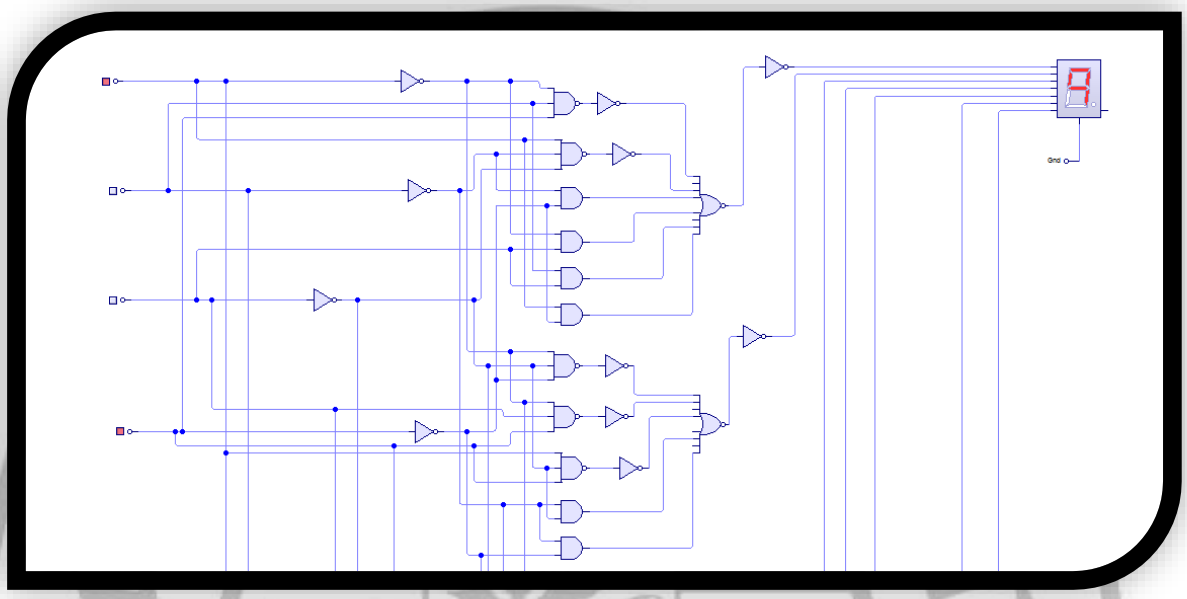

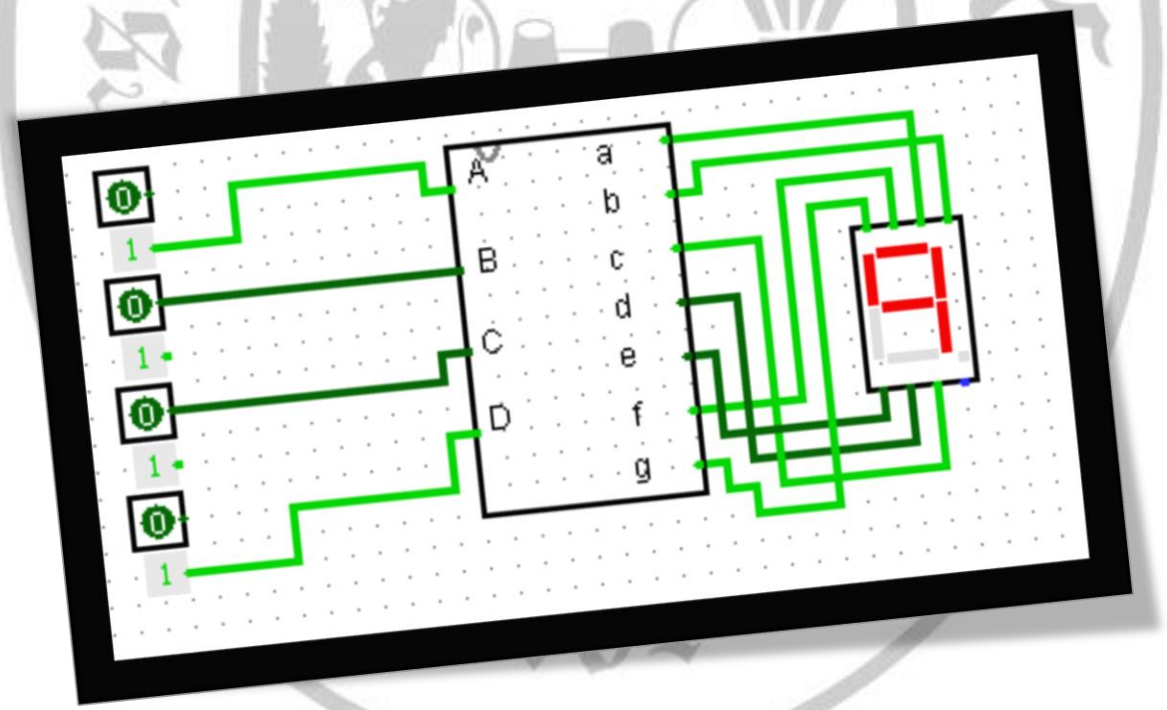

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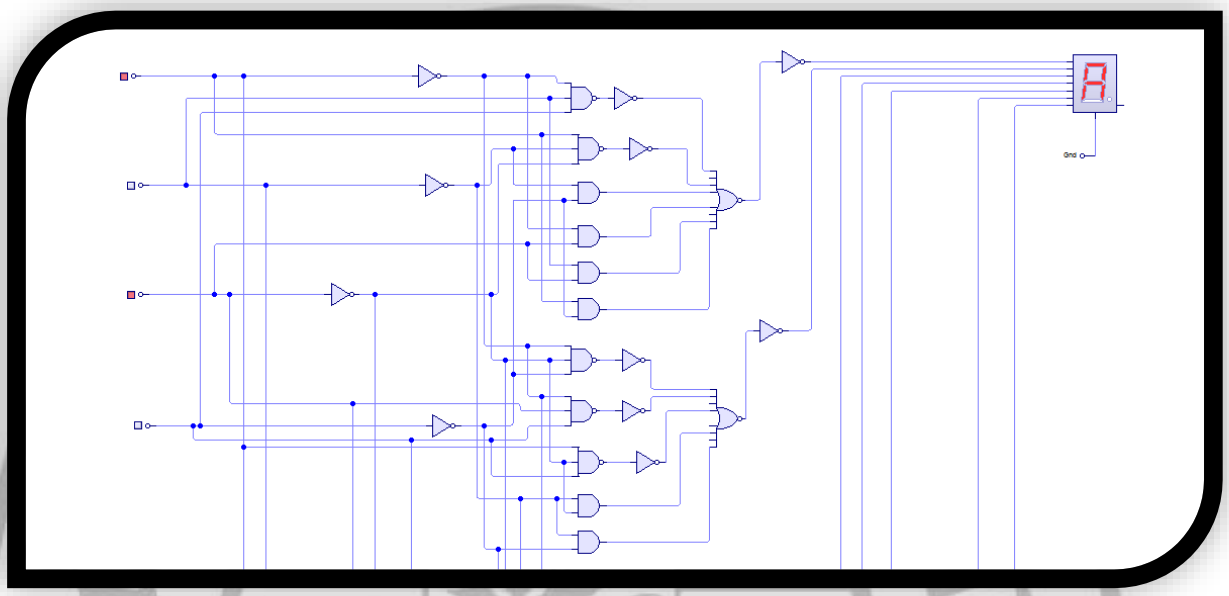

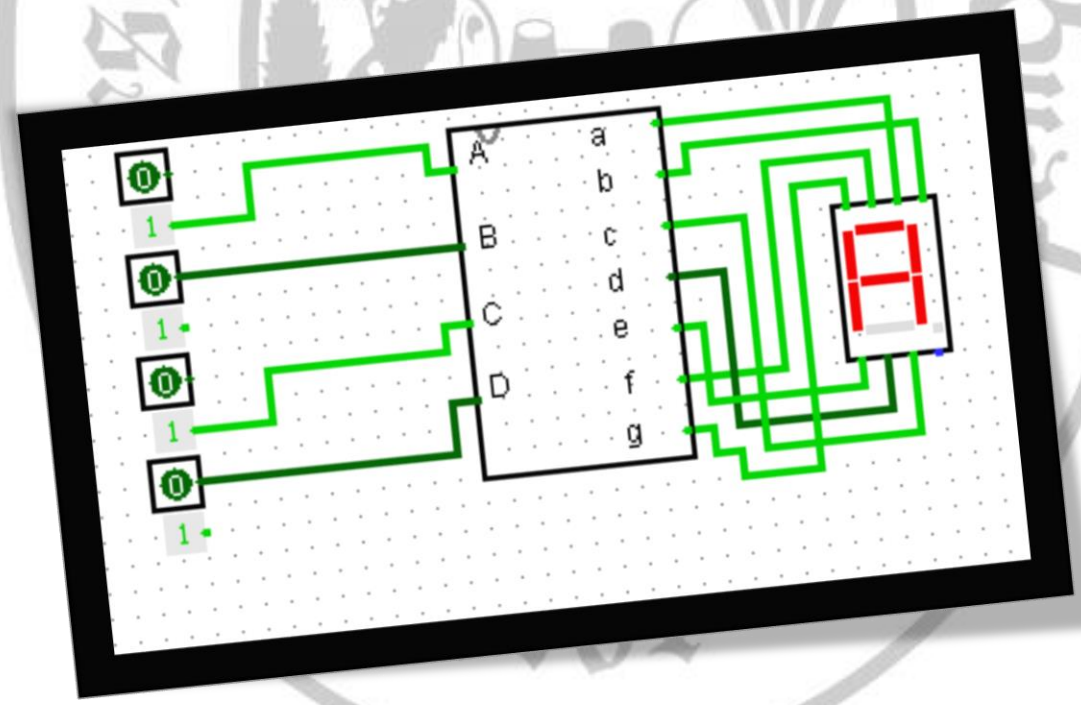

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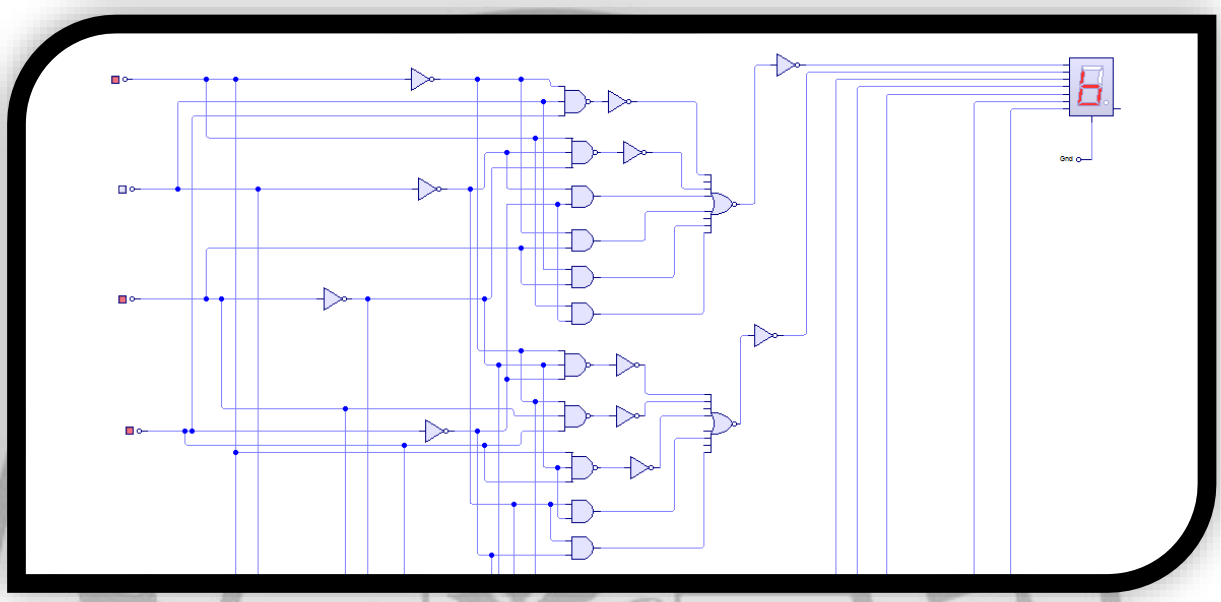

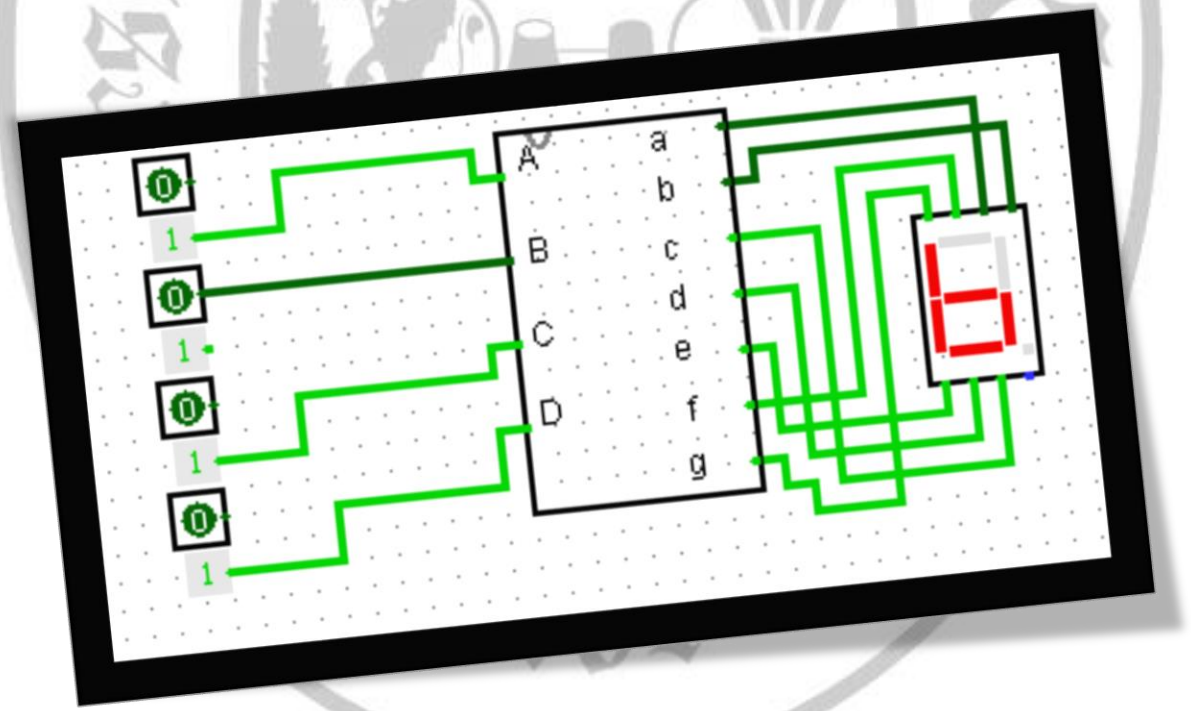

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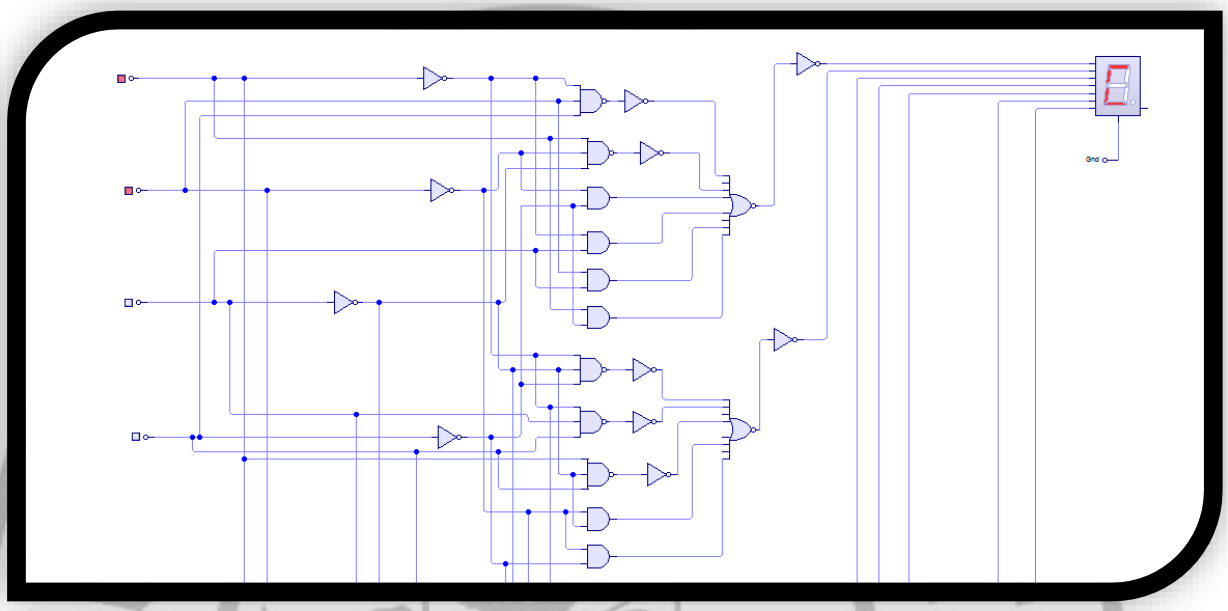
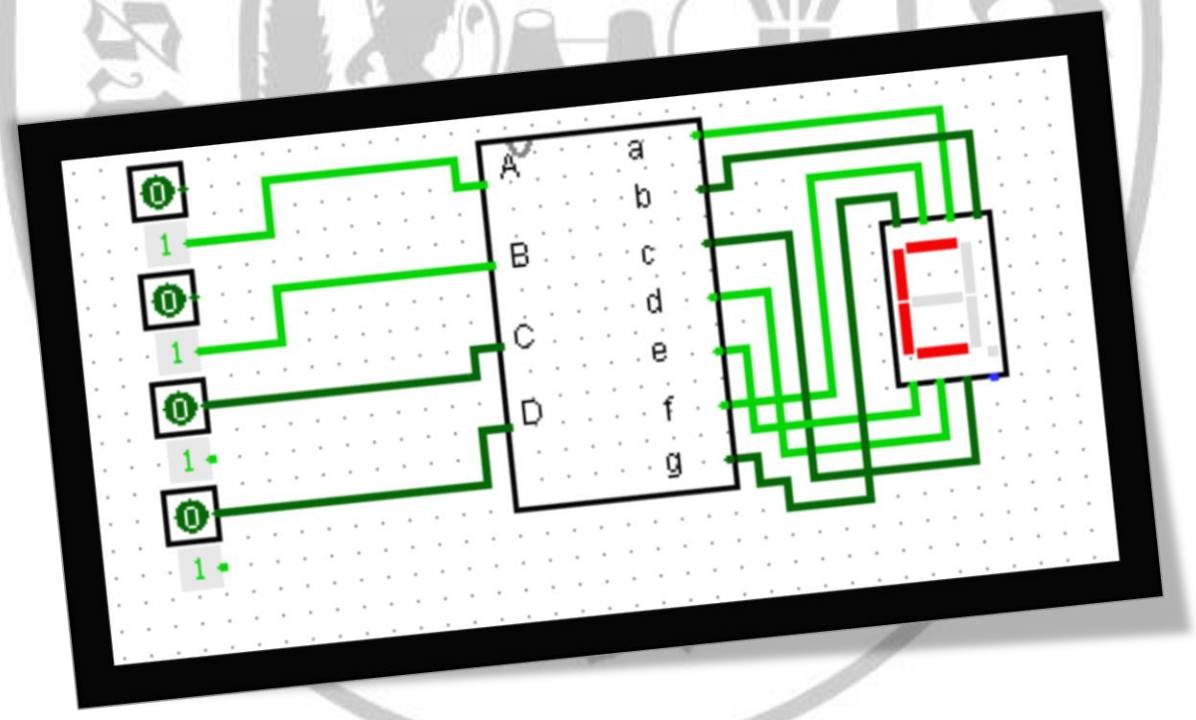
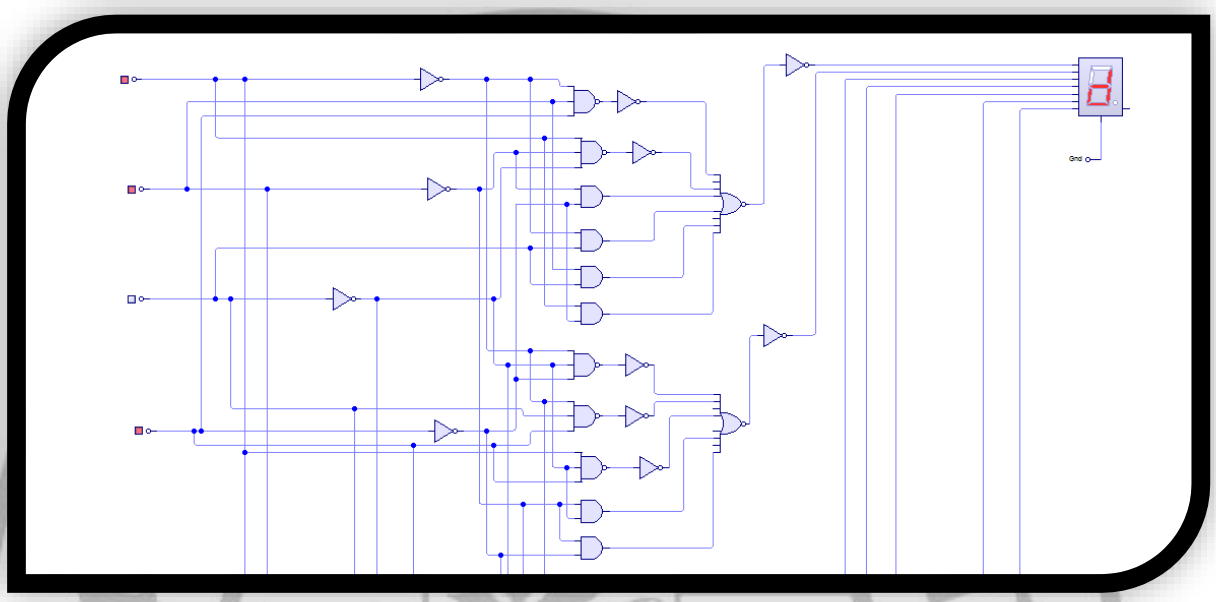
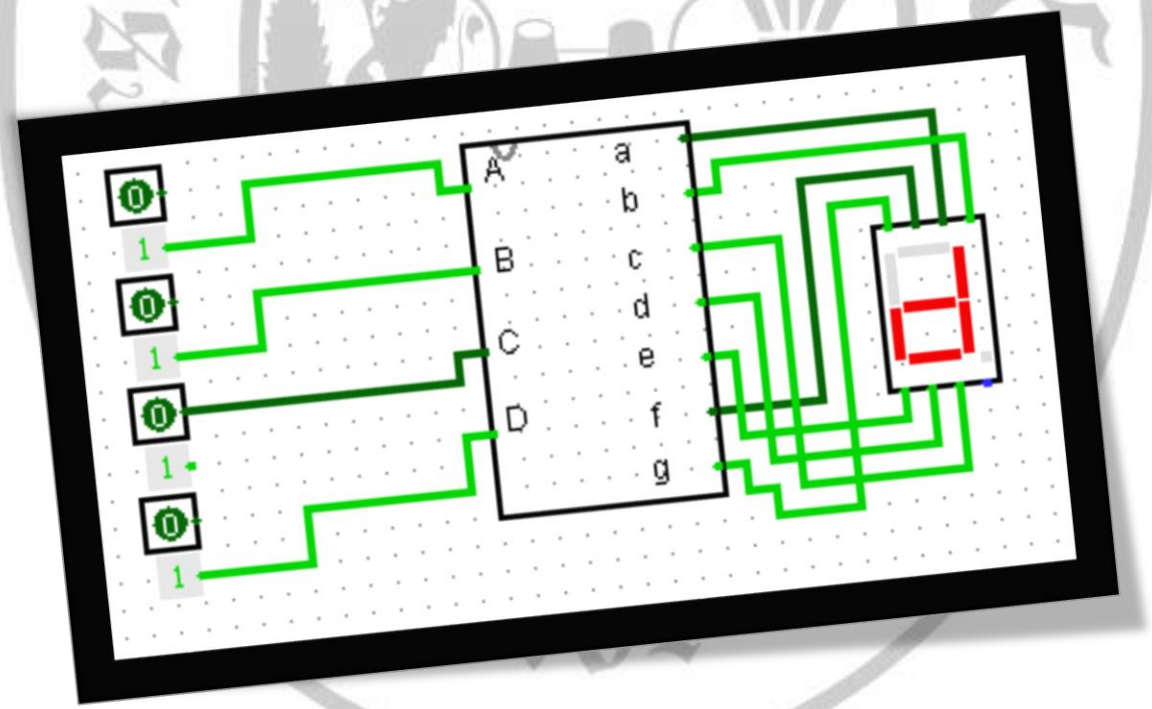


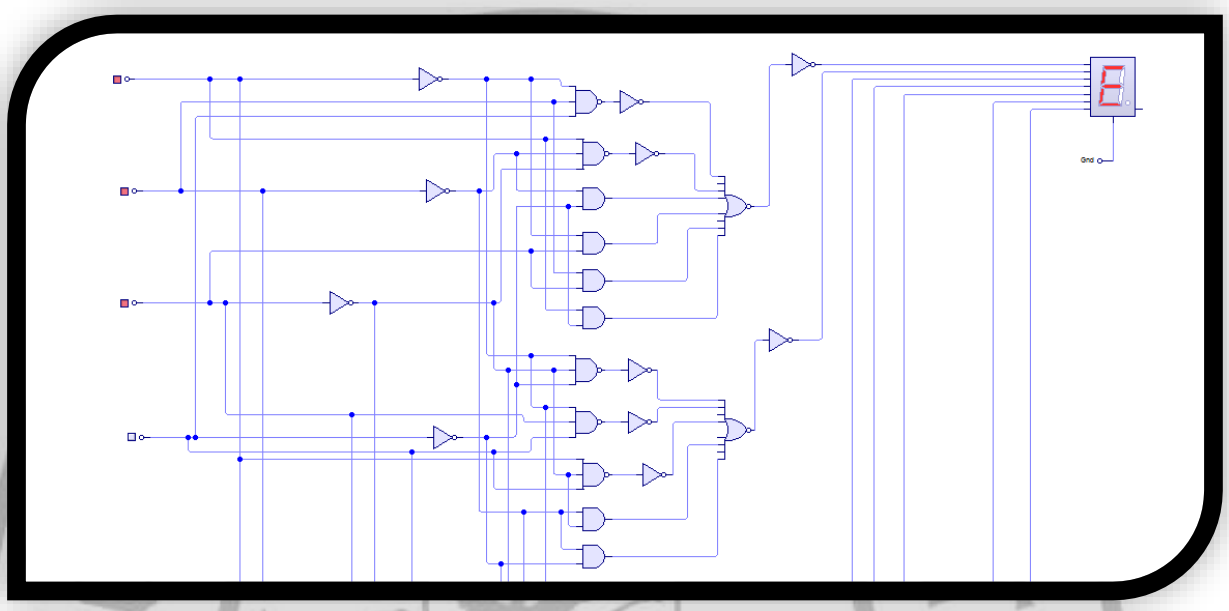


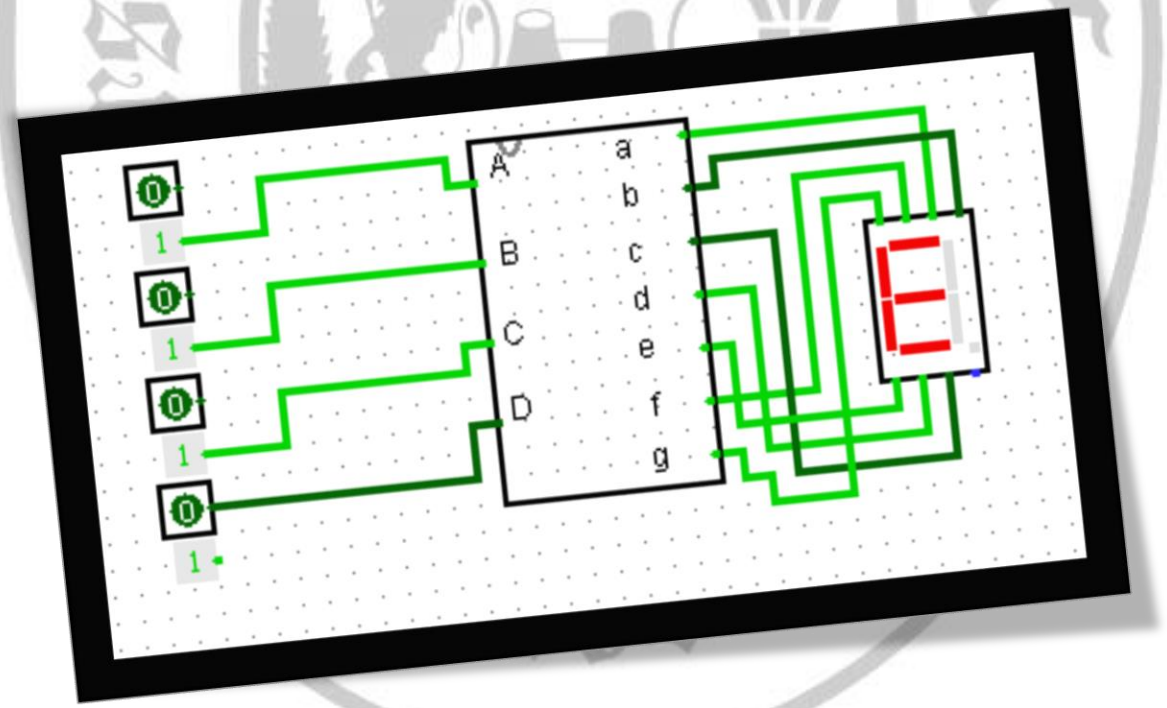
✓ *Número 13:*





✓ *Número 14:*





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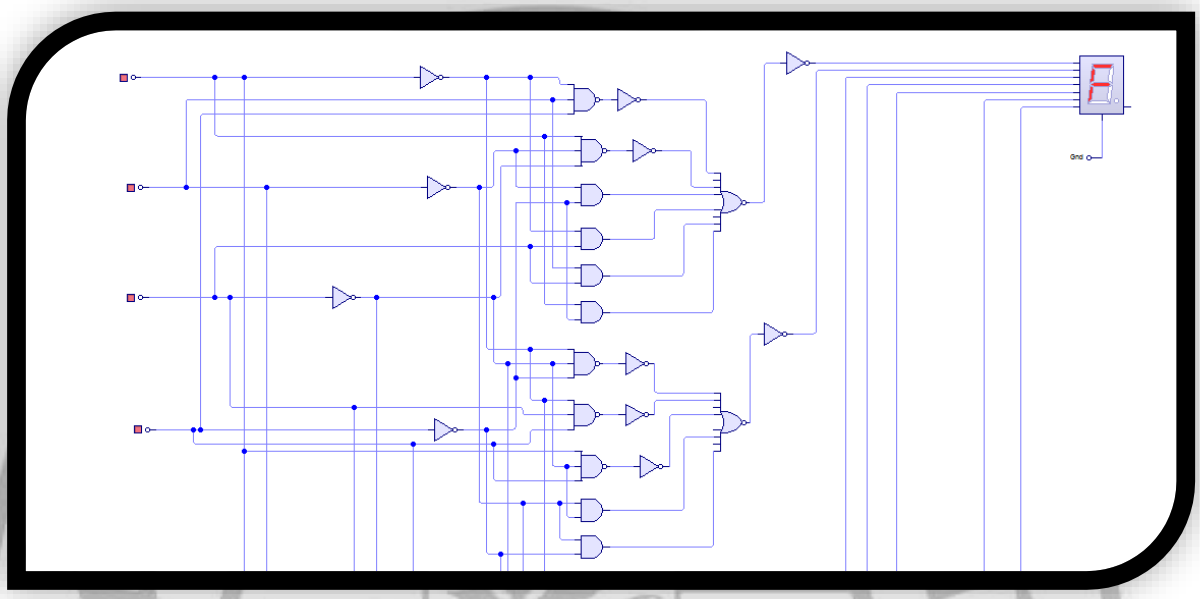
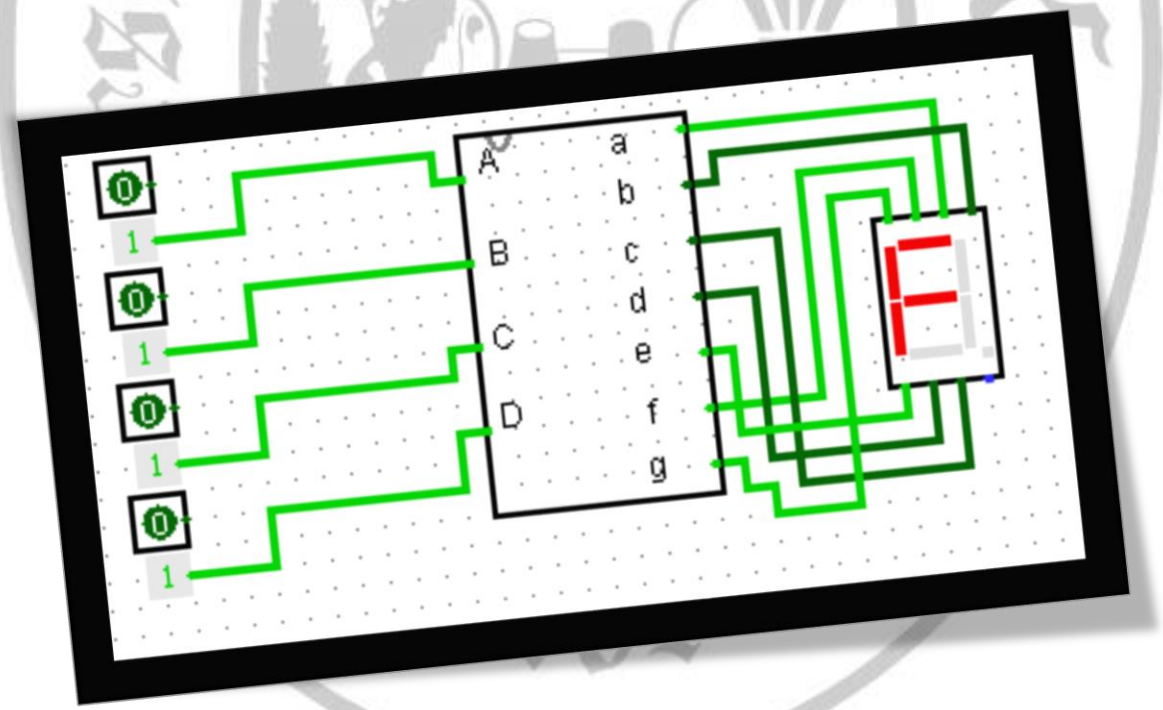





SEGUNDA PARTE
COMPLEJO DE OPERACIONES ARITMÉTICAS
DIVISIÓN BINARIA

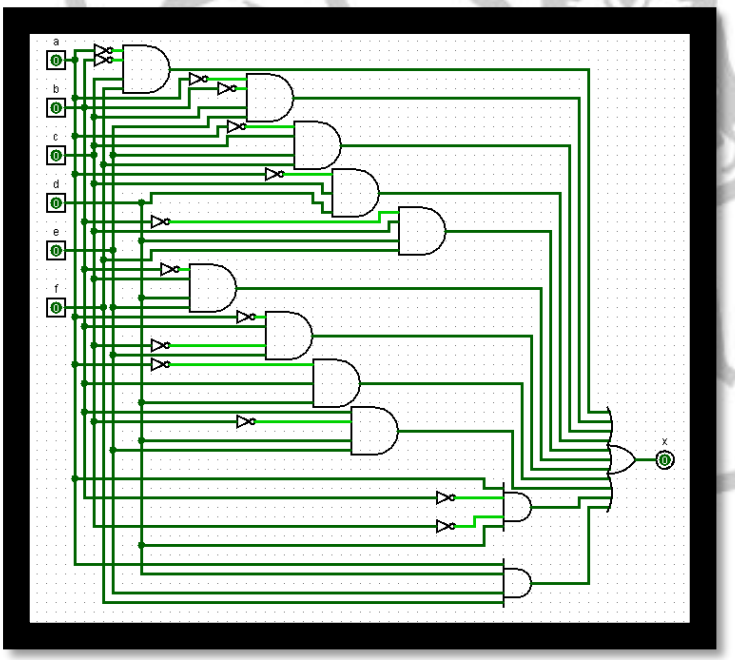
- *Proceso de la División Binaria: (Verificación de Dividendo y Divisor)*

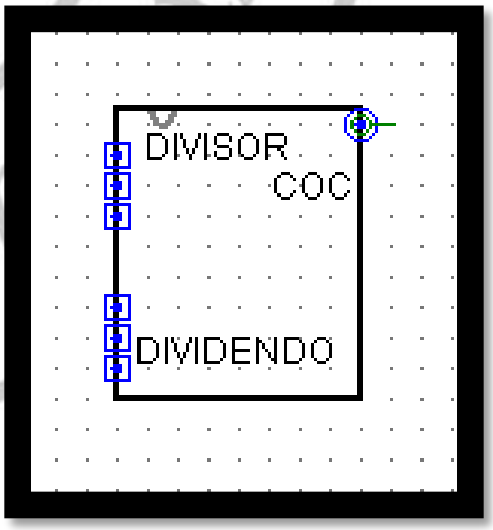
1. COCIENTE DE "6":

Kamaugh map

	000	001	011	010	100	101	111	110
000	0 0	0 1	0 3	0 2	0 16	0 17	1 19	1 18
001	0 4	0 5	0 7	0 6	1 20	1 21	1 23	1 22
011	1 12	1 13	1 15	1 14	1 28	1 29	1 31	1 30
010	0 8	1 9	1 11	1 10	0 24	0 25	1 27	0 26
100	0 32	0 33	0 35	0 34	0 48	0 49	0 51	0 50
101	1 36	1 37	1 39	1 38	0 52	0 53	1 55	1 54
111	0 44	1 45	1 47	1 46	0 60	0 61	1 63	0 62
110	0 40	0 41	0 43	0 42	0 56	0 57	0 59	0 58

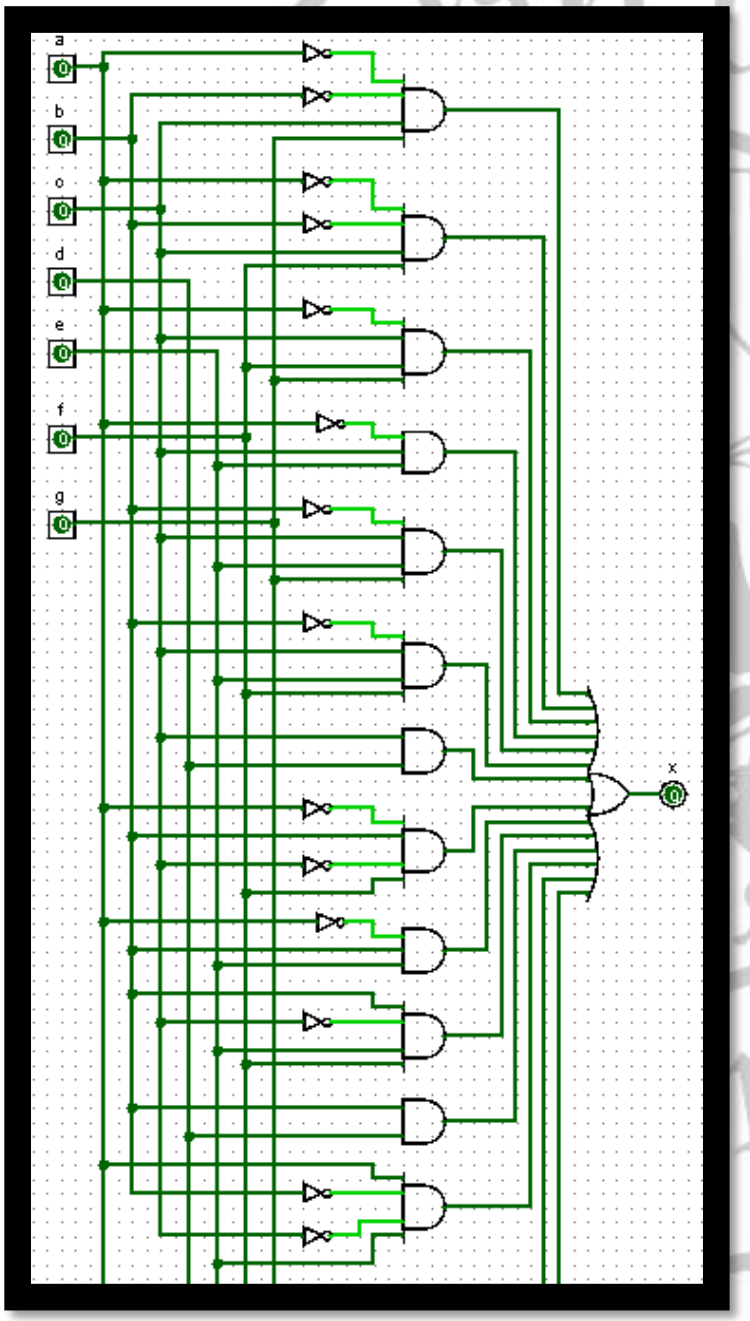
x= (¬A ~B C F) + (~A ~B C E) + (~A C E F) + (~A C D) + (~B C D F) + (~B C D E) + (~A B ~C E) + (~A B D) + (B ~C D E) + (A ~B ~C D) + (A D E F)

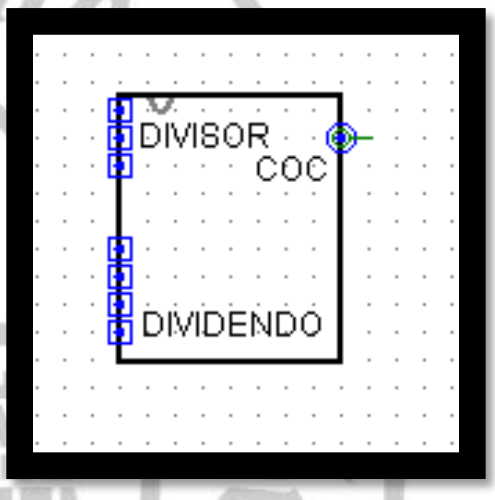




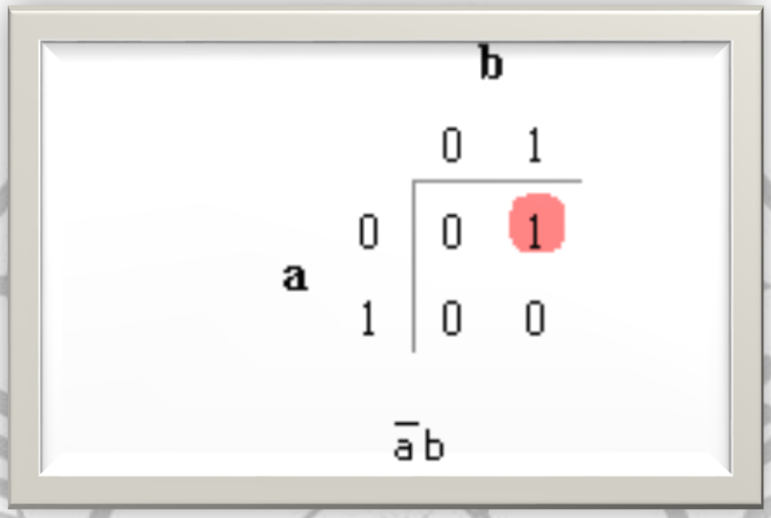
2. COCIENTE DE “7”:

x= ~a ~b c g + ~a ~b c f + ~a c f g + ~a c e + ~b c e g + ~b c e f + c d + ~a b ~c f + ~a b e + b ~c e f + b d + a ~b ~c e + a e f g + a d

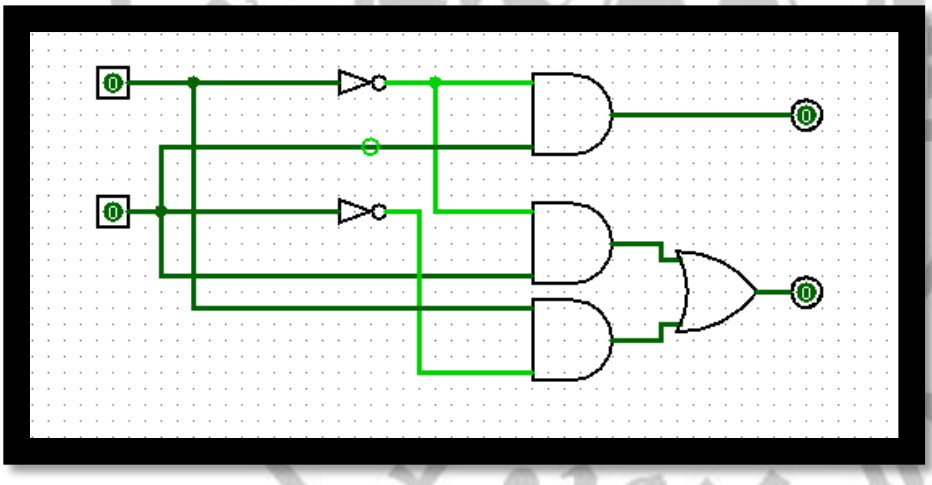


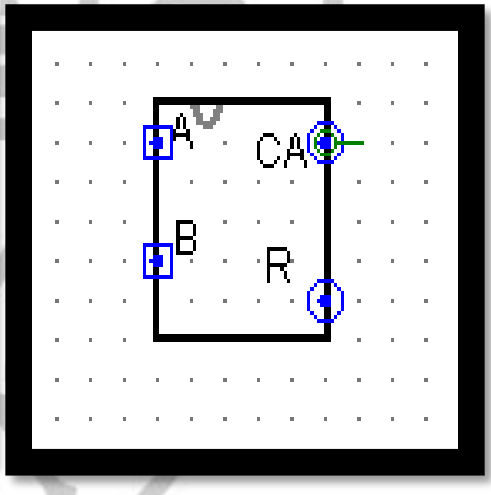


3. RESTA DE “2”:

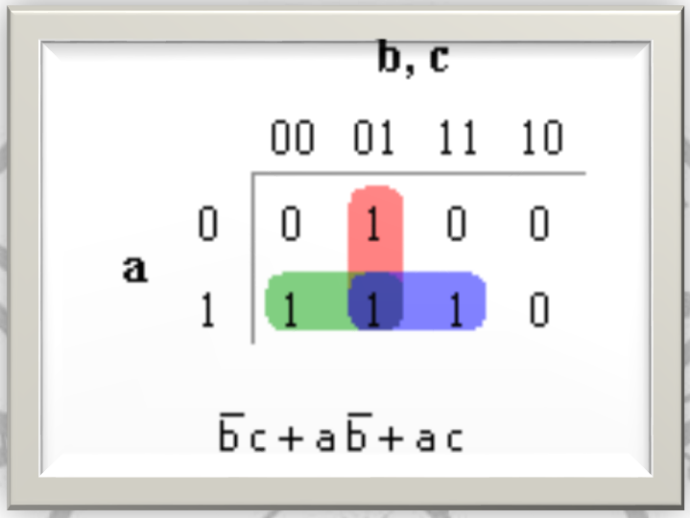


x= ~a b

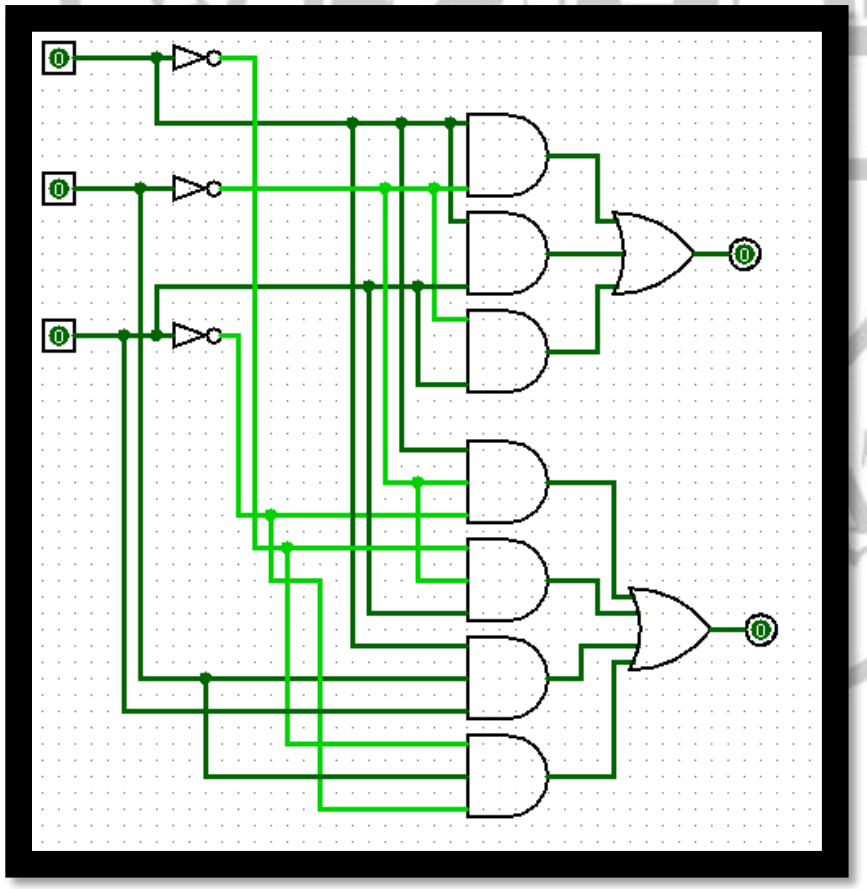


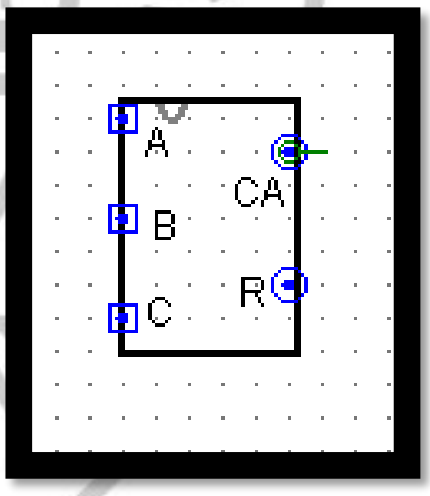


4. RESTA DE “3”:



x= a ~b + a c + ~b c





5. PRODUCTO:

a, b \ c, d	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	1	1	0
10	0	1	1	0

a d

x= a d