

Trabalho Prático 1

Filipe de Araújo Mendes - 2021031920

Universidade Federal de Minas Gerais (UFMG)
Belo Horizonte - MG - Brasil

flipeara@ufmg.br

1. Forma Canônica

1.1. BCD[3]

$$\text{BCD}[3] = \Sigma m(8, 9, 10, 11, 12, 13, 14, 15)$$

1.2. BCD[2]

$$\text{BCD}[2] = \Sigma m(4, 5, 6, 7, 12, 13, 14, 15)$$

1.3. BCD[1]

$$\text{BCD}[1] = \Sigma m(2, 3, 6, 7, 10, 11, 14, 15)$$

1.4. BCD[0]

$$\text{BCD}[0] = \Sigma m(1, 3, 5, 7, 9, 11, 13, 15)$$

2. Produto de Somas

2.1. BCD[3]

$$\text{BCD}[3] = (g_3)$$

2.2. BCD[2]

$$\text{BCD}[2] = (g_3 + g_2) (g_3' + g_2')$$

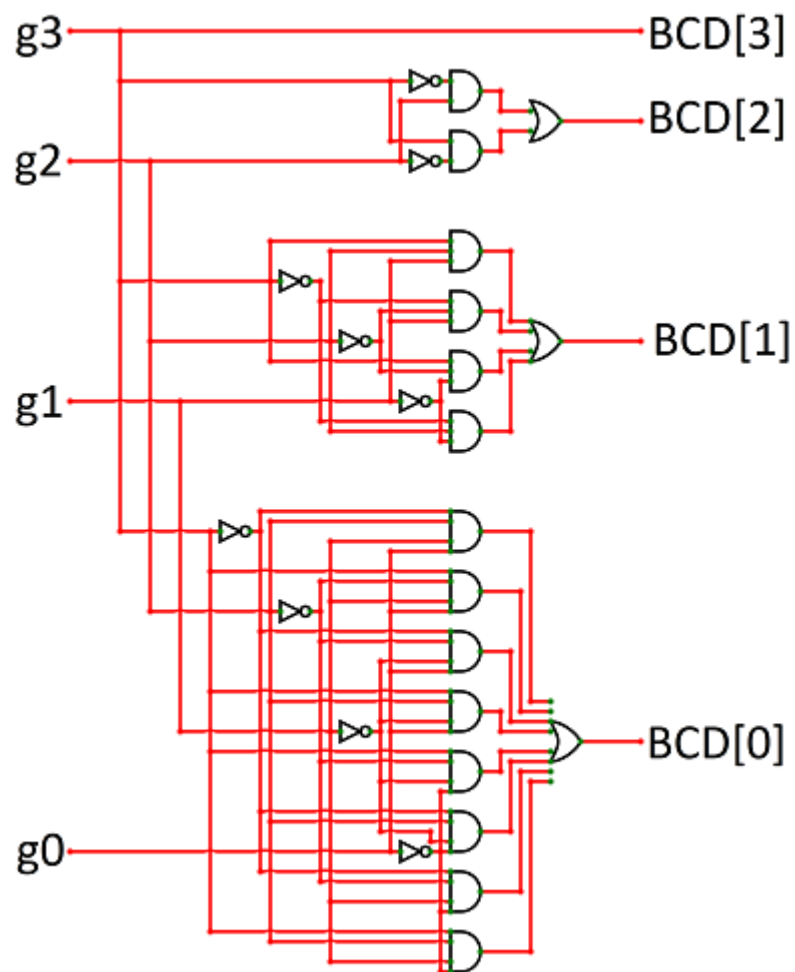
2.3. BCD[1]

$$\text{BCD}[1] = (g_3 + g_2 + g_1) (g_3 + g_2' + g_1') (g_3' + g_2 + g_1') (g_3' + g_2' + g_1)$$

2.4. BCD[0]

$$\begin{aligned} \text{BCD}[0] = & (g_3 + g_2 + g_1 + g_0) (g_3 + g_2 + g_1' + g_0') (g_3 + g_2' + g_1 + g_0') \\ & (g_3 + g_2' + g_1' + g_0) (g_3' + g_2 + g_1 + g_0') (g_3' + g_2 + g_1' + g_0) (g_3' + g_2' + g_1 \\ & + g_0) (g_3' + g_2' + g_1' + g_0') \end{aligned}$$

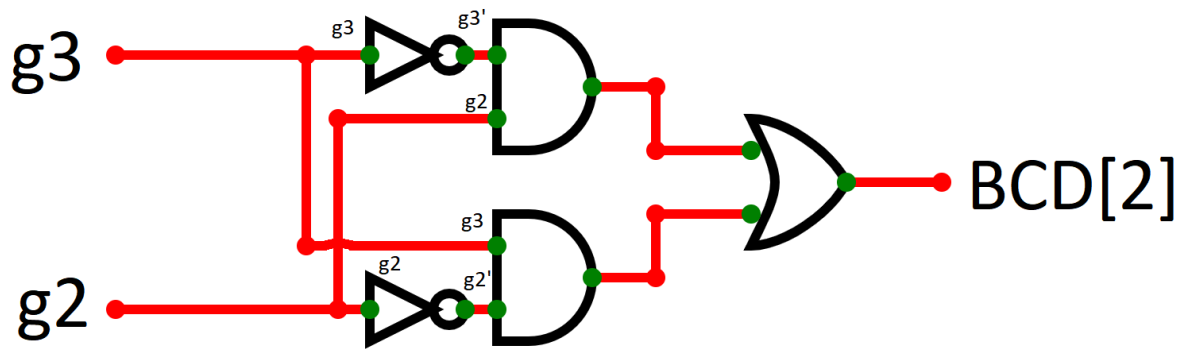
3. Circuito



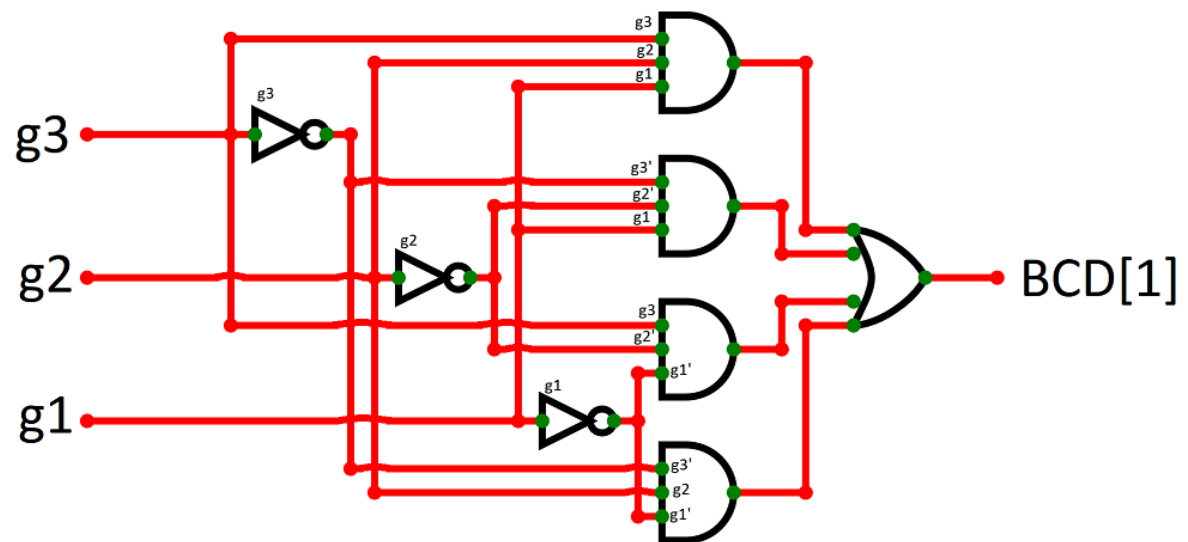
3.1. BCD[3]

g_3 — $\text{BCD}[3]$

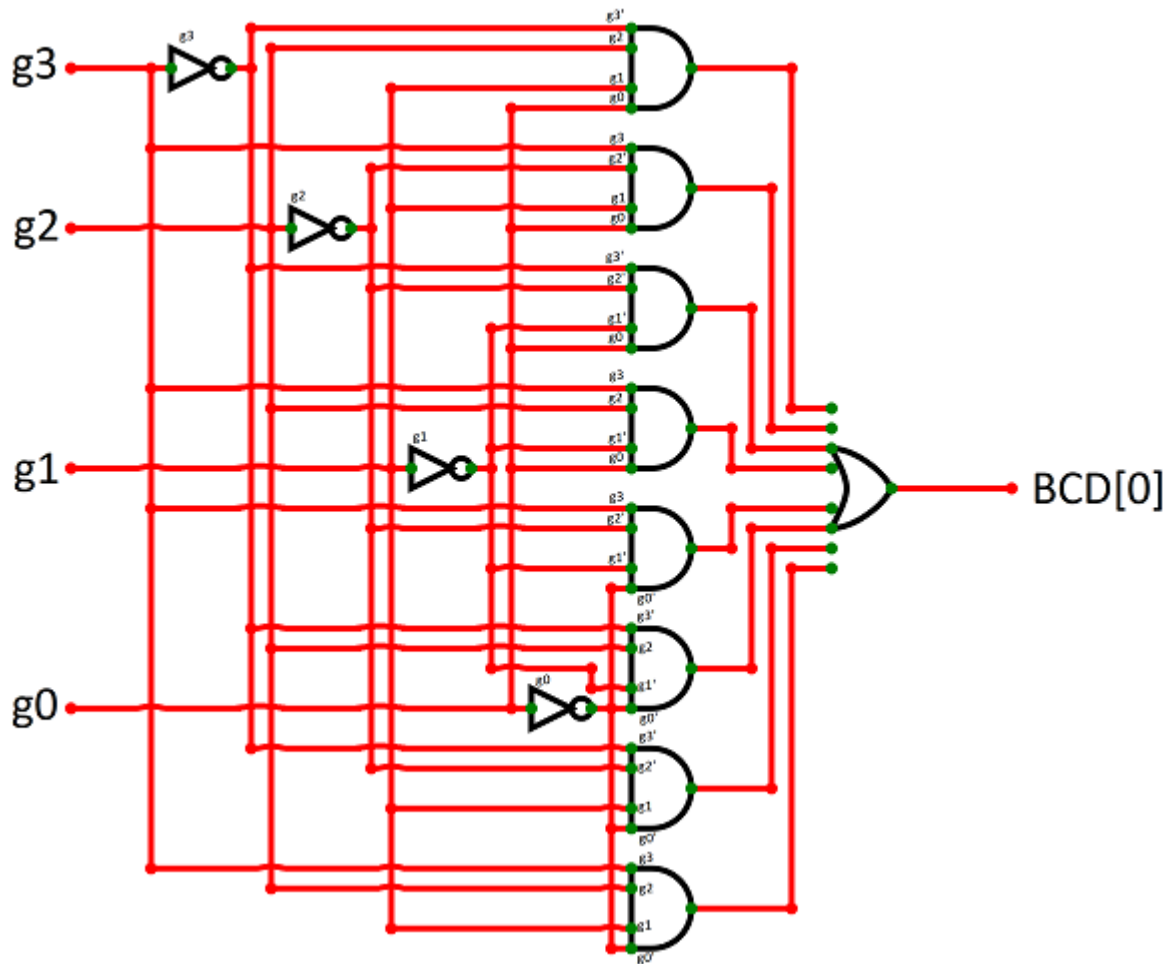
3.2. BCD[2]



3.3. BCD[1]



3.4. BCD[0]



3. Formas de Onda

	0	1	2	3	4	5	6	7
bcd_out[3:0]	0	1	2	3	4	5	6	7
gray_in[3:0]	0	1	3	2	6	7	5	4
bcd[3:0]	0	1	2	3	4	5	6	7
gray[3:0]	0	1	3	2	6	7	5	4
	0	10						
8	9	a	b	c	d	e	f	
c	d	f	e	a	b	9	8	
8	9	a	b	c	d	e	f	
c	d	f	e	a	b	9	8	
	0							
bcd_out[3:0]	0	1	10	11	100	101	110	111
gray_in[3:0]	0	1	11	10	110	111	101	100
bcd[3:0]	0	1	10	11	100	101	110	111
gray[3:0]	0	1	11	10	110	111	101	100
	0	10						
1000	1001	1010	1011	1100	1101	1110	1111	
1100	1101	1111	1110	1010	1011	1001	1000	
1000	1001	1010	1011	1100	1101	1110	1111	
1100	1101	1111	1110	1010	1011	1001	1000	