

# ENTREGA PRÁCTICA FASE 2 - FUNDAMENTOS DE LOS COMPUTADORES

Soy Iván Soler del grupo ARA de primer año del Ingeniería Informática y esta es mi entrega de la segunda práctica de la asignatura.

En esta práctica trabajamos principalmente funciones y como simplificarlas, también introducimos logisim, programa el cual nos permite ver de forma gráfica y más sencilla todo el tema.

~~1.1) & 1.1)~~ 1.1)

AB

A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	1	1	1	1	1	1	0
0	0	0	1	0	1	1	0	0	0	0
0	0	1	0	1	1	0	1	1	0	1
0	0	1	1	1	1	1	1	0	0	1
0	1	0	0	0	1	1	0	0	1	1
0	1	0	1	1	0	1	1	0	1	1
0	1	1	0	1	0	1	1	1	1	1
0	1	1	1	1	1	1	0	0	0	0
1	0	0	0	1	1	1	1	1	1	1
1	0	0	1	1	1	1	0	0	1	1
1	0	1	0	0	0	0	0	0	0	0
1	0	1	1	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0
1	1	0	1	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0

$$1.2) S_a = (A+B+C+\bar{D}) (A+\bar{B}+C+D) (\bar{A}+B+\bar{C}+D) \\ (\bar{A}+B+\bar{C}+D) (\bar{A}+\bar{B}+\bar{C}+\bar{D}) (\bar{A}+\bar{B}+C+D) \\ (\bar{A}+\bar{B}+C+\bar{D}) (\bar{A}+\bar{B}+\bar{C}+D) (\bar{A}+\bar{B}+\bar{C}+\bar{D})$$

$$S_b = (\bar{A}+B+\bar{C}+D) (\bar{A}+B+\bar{C}+\bar{D}) (A+\bar{B}-C+\bar{D}) \\ (A+\bar{B}+\bar{C}+D) (\bar{A}+\bar{B}+C+D) (\bar{A}+\bar{B}+C+\bar{D}) \\ (\bar{A}+\bar{B}+\bar{C}+D) (\bar{A}+\bar{B}+\bar{C}+\bar{D})$$

$$S_c = (\bar{A}+B+\bar{C}+D) (\bar{A}+B+\bar{C}+\bar{D}) (A+B+\bar{C}+D) \\ (\bar{A}+\bar{B}+C+D) (\bar{A}+\bar{B}+C+\bar{D}) (\bar{A}+\bar{B}+\bar{C}+D) (\bar{A}+\bar{B}+\bar{C}+\bar{D})$$

$$S_d = (\bar{A}\bar{B}\bar{C}\bar{D}) + (\bar{A}\bar{B}\bar{C}D) + (\bar{A}B\bar{C}\bar{D}) + (A\bar{B}\bar{C}\bar{D})$$

$$S_e = (\bar{A}\bar{B}\bar{C}\bar{D}) + (\bar{A}\bar{B}C\bar{D}) + (\bar{A}B\bar{C}\bar{D}) + (A\bar{B}\bar{C}\bar{D})$$

$$S_g = (\bar{A}B\bar{C}\bar{D}) + (\bar{A}\bar{B}C\bar{D}) + (\bar{A}B\bar{C}D) + (\bar{A}B\bar{C}\bar{D}) + (\bar{A}\bar{B}C\bar{D}) + \\ (\bar{A}\bar{B}C\bar{D})$$

$$S_g = (\bar{A}\bar{B}C\bar{D}) + (\bar{A}\bar{B}C\bar{D}) + (\bar{A}\bar{B}C\bar{D}) + (\bar{A}\bar{B}C\bar{D}) + (\bar{A}\bar{B}C\bar{D}) + \\ (\bar{A}\bar{B}C\bar{D}) + (\bar{A}\bar{B}C\bar{D}) + (\bar{A}\bar{B}C\bar{D})$$

$$1.4) \text{ AND} = 26 \quad \text{OR} = 27 \quad \text{NOT} = 119$$

$$T_{01} = 26 + 27 + 119 = \cancel{172} \quad 172$$

2.1 & 2.2

a)

AB \ CD	CD			
	00	01	11	10
00	1	0	1	1
01	0	1	1	1
11	0	0	0	1
10	1	1	0	0

$$\bar{a}\bar{b}\bar{c} + \bar{a}b\bar{c} + \bar{a}b\bar{c} + \bar{a}b\bar{c}$$

b)

AB \ CD	CD			
	00	01	11	10
00	1	1	1	1
01	1	0	1	0
11	0	0	0	0
10	1	1	0	0

$$\bar{a}\bar{b} + \bar{a}c\bar{d} + \bar{b}c + \bar{a}cd$$

c)

AB \ CD	CD			
	00	01	11	10
00	1	1	1	0
01	1	1	1	1
11	0	0	0	0
10	1	1	0	0

$$\bar{b}c + \bar{a}d + \bar{a}b$$

d)

AB \ CD	CD			
	00	01	11	10
00	1	0	1	1
01	0	1	0	1
11	0	0	0	0
10	1	0	0	0

$$\bar{b}c\bar{d} + \bar{a}b\bar{c} + \bar{a}c\bar{d} + \bar{a}b\bar{c}d$$



7)  $AB$   $\begin{matrix} C \\ \swarrow \end{matrix}$

1	0	0	1
0	0	0	1
0	0	0	0
1	0	0	0

$\overline{b}\overline{a}d + \overline{a}c\overline{d}$

8)  $AB$   $\begin{matrix} C \\ \swarrow \end{matrix}$

1			
1	→		1
1	→		

$\overline{a}\overline{c}\overline{d} + \overline{a}b\overline{c} + \overline{a}b\overline{d} + \overline{a}b\overline{c}$

9)  $AB$   $\begin{matrix} C \\ \swarrow \end{matrix}$

			1
1	→		1
1	→		

$\overline{a}\overline{b}c + \overline{a}b\overline{c} + \overline{a}b\overline{d} + \overline{a}b\overline{c}$

2.4) NOT=22 AND=17 OR=7

$P_5 = 22 + 7 + 17 = 46$

Para calcular el porcentaje de optimización:

$\left(1 - \frac{46}{192}\right) \cdot 100 = 73,25\%$