

Minitérminos y Captura Esquemática

*"Como un faro entre la naturaleza,
el ingeniero guía el camino entre la lógica
y la creatividad para transformar el mundo."*



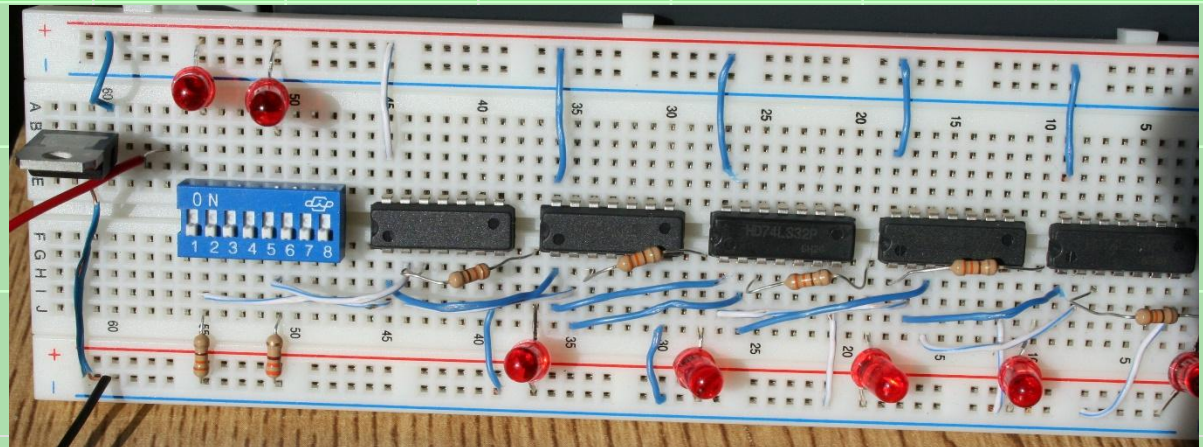
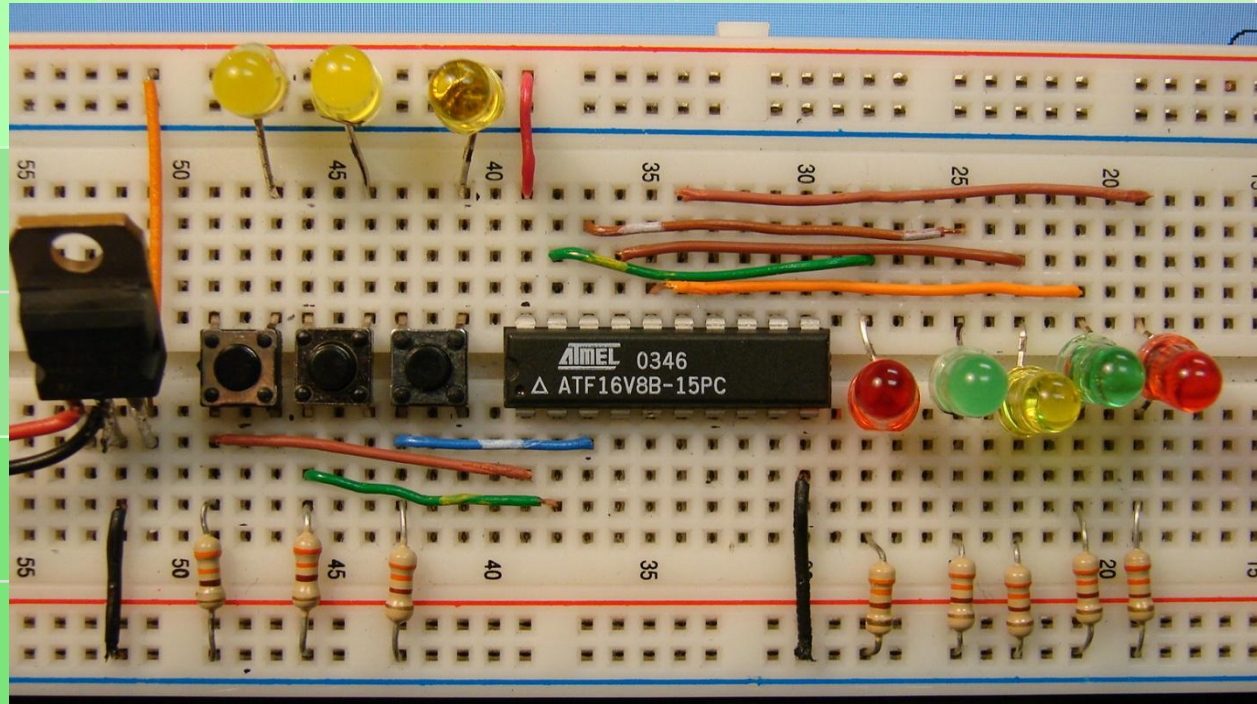
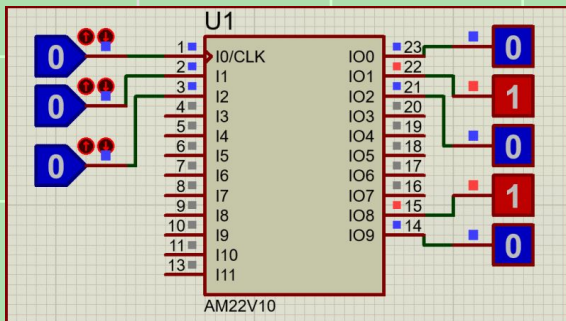
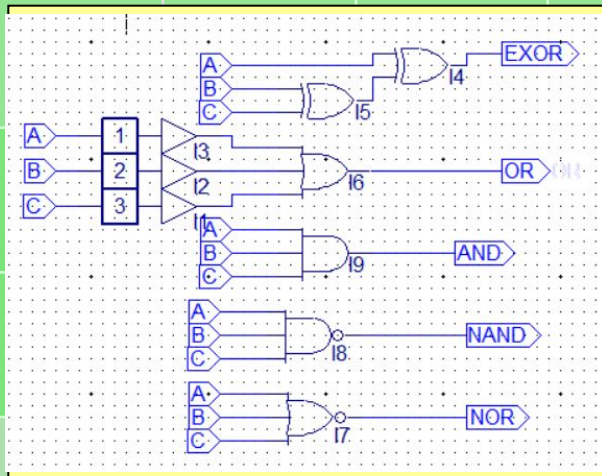
Minitérminos y Captura Esquemática

*"Como un faro entre la naturaleza,
el ingeniero guía el camino entre la lógica
y la creatividad para transformar el mundo."*



***Presa el cuchillo
China N.L..***

Miniterminos Captura Esquemática



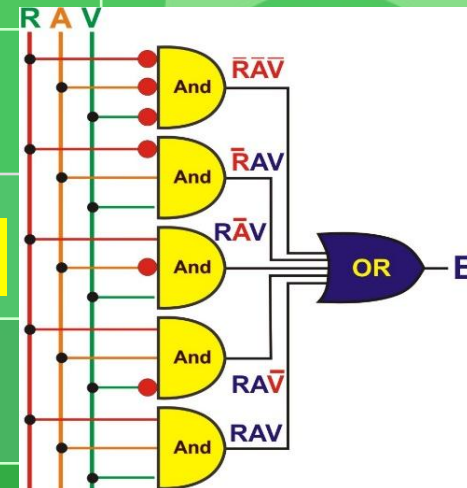
Miniterminos

Tabla → Ecuación → Circuito

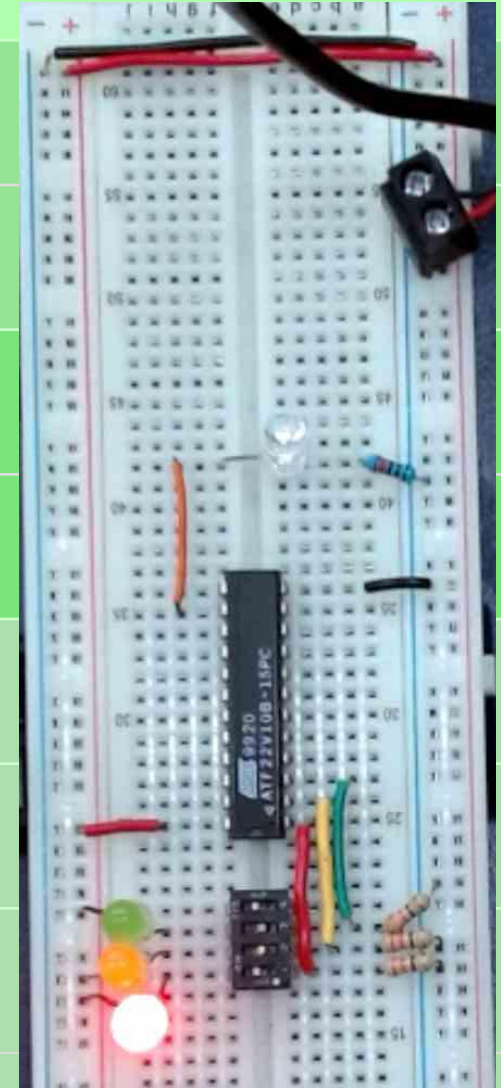
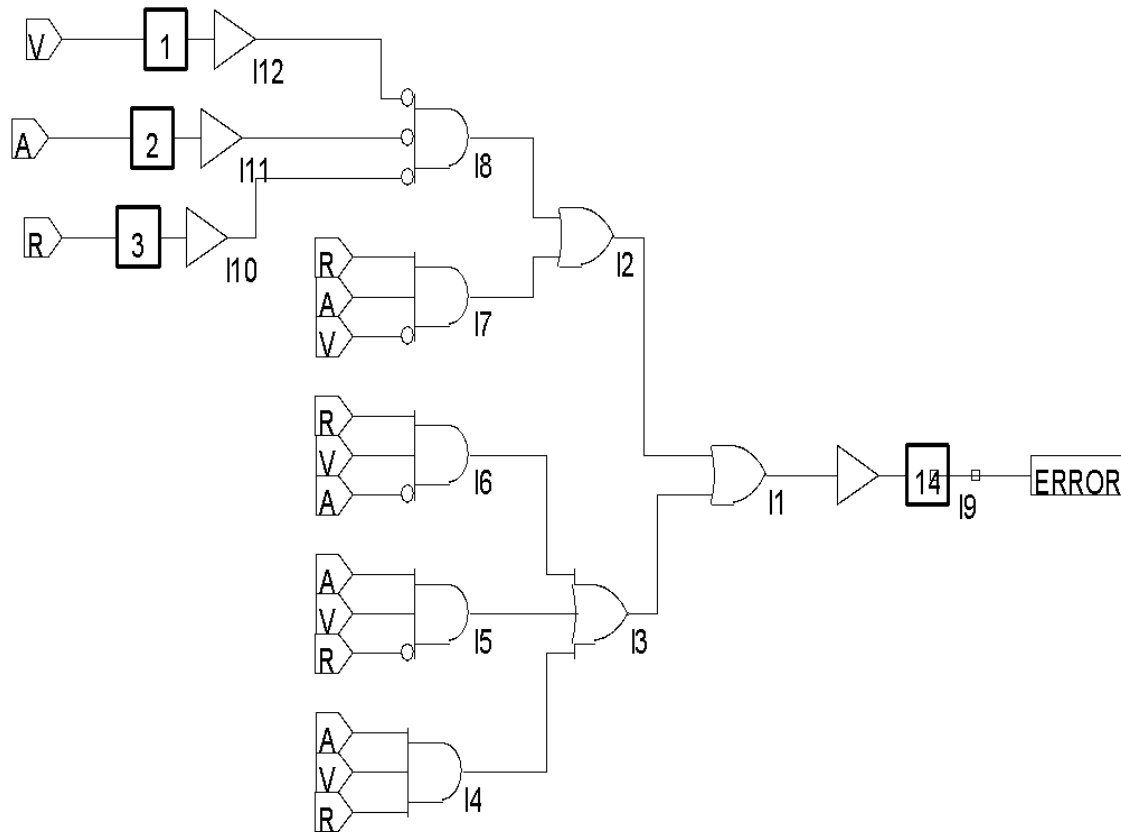
m	R	A	V	E
0	0	0	0	1
1	0	0	1	0
2	0	1	0	0
3	0	1	1	1
4	1	0	0	0
5	1	0	1	1
6	1	1	0	1
7	1	1	1	1

$$FE_{(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}AV + R\bar{A}V + RA\bar{V} + RAV$$

$$FE_{(R,A,V)} = \sum m(0,3,5,6,7)$$



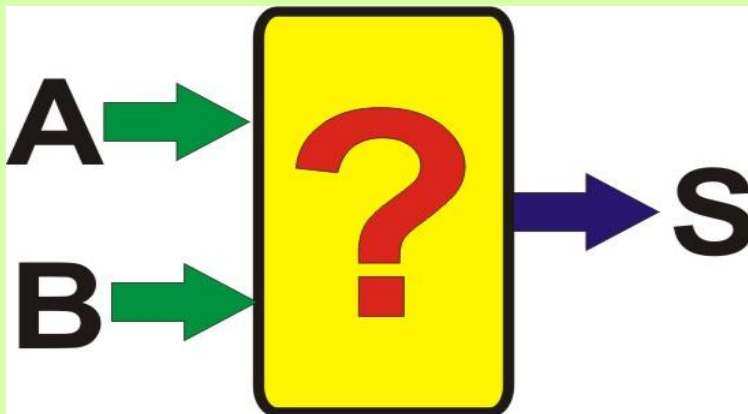
Captura Esquemática



Minitermino

Termino producto (AND)
que contiene todas las variables de
la función
ya sea en su forma normal (afirmada)
o
complementada (negada)

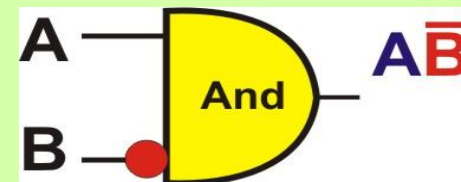
Minitermino



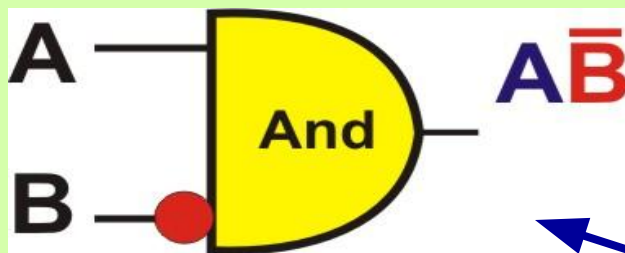
	Entradas		Salida
m	A	B	S
0	0	0	0
1	0	1	0
2	1	0	1
3	1	1	0

Minitermino

	Entradas		Salida
m	A	B	S
0	0	0	0
1	0	1	0
2	1	0	1
3	1	1	0



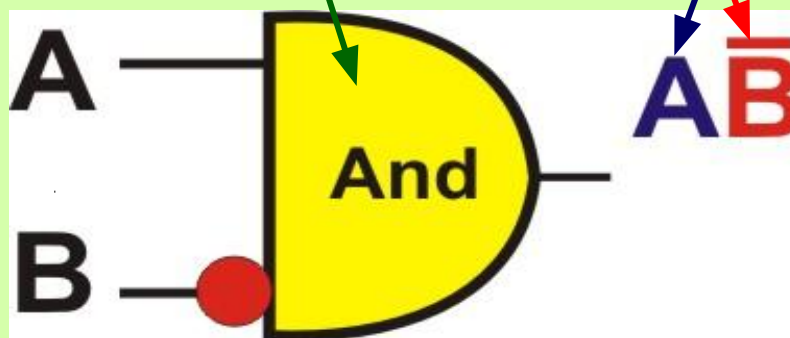
Minitermino



	Entradas		Salida
m	A	B	S
0	0	0	0
1	0	1	0
2	1	0	1
3	1	1	0

Minitermino

Termino producto (**AND**) que contiene todas las variables de la función ya sea en su forma normal (afirmada) o complementada (**negada**)



Minitermino

	Entradas		Salida
m	A	B	S
0	0	0	$\bar{A}\bar{B}$
1	0	1	$\bar{A}B$
2	1	0	$A\bar{B}$
3	1	1	AB

Con el Minitermino podemos obtener la ecuación a partir de la tabla de verdad

	Entradas		Salida
m	A	B	S
0	0	0	0
1	0	1	1
2	1	0	0
3	1	1	1

SOP

$$F_{S(A,B)} = \bar{A}B + AB$$

Minitérmino

	Entradas		Salida
m	A	B	S
0	0	0	0
1	0	1	1
2	1	0	0
3	1	1	1

$$F_{S(A,B)} = \bar{A}B + AB$$

SOP

Suma de productos

Minitermino

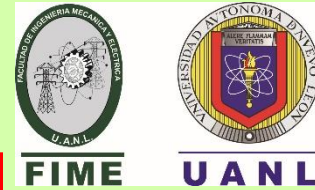
	Entradas		Salida
m	A	B	S
0	0	0	0
1	0	1	1
2	1	0	0
3	1	1	1

Forma Canónica

$$F_{S_{(A,B)}} = m_1 + m_3$$

$$F_{S_{(A,B)}} = \sum m(1,3)$$

Minitermino

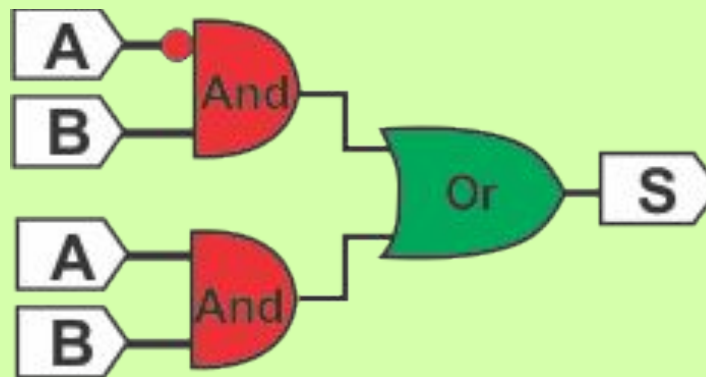


$$F_{S(A,B)} = \bar{A}B + AB \quad \text{SOP}$$

Forma Canónica

$$F_{S(A,B)} = \sum m(1,3)$$

And/Or



Minitermino 3 variables

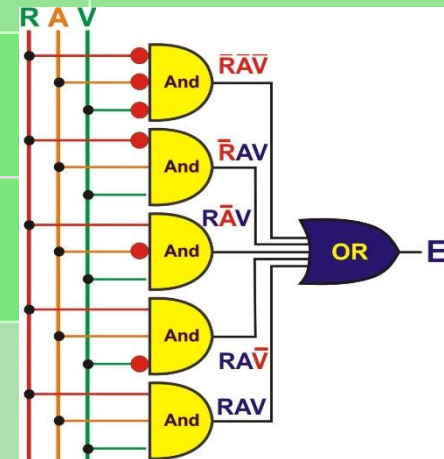
m	A	B	C	
0	0	0	0	$\bar{A} \bar{B} \bar{C}$
1	0	0	1	$\bar{A} \bar{B} C$
2	0	1	0	$\bar{A} B \bar{C}$
3	0	1	1	$\bar{A} B C$
4	1	0	0	$A \bar{B} \bar{C}$
5	1	0	1	$A \bar{B} C$
6	1	1	0	$A B \bar{C}$
7	1	1	1	$A B C$

Miniterminos

Tabla → Ecuación → Circuito

m	R	A	V	E
0	0	0	0	1
1	0	0	1	0
2	0	1	0	0
3	0	1	1	1
4	1	0	0	0
5	1	0	1	1
6	1	1	0	1
7	1	1	1	1

$$FE_{(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}AV + R\bar{A}V + RA\bar{V} + RAV$$



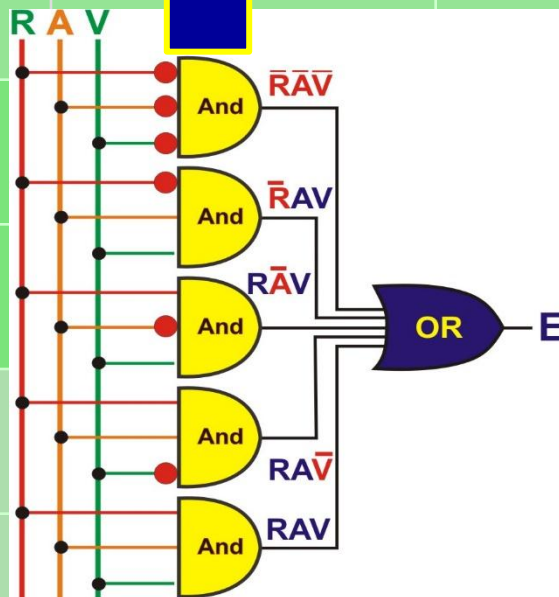
Método
Analítico

Tabla de Verdad

m	R	A	V	E
0	0	0	0	1
1	0	0	1	0
2	0	1	0	0
3	0	1	1	1
4	1	0	0	0
5	1	0	1	1
6	1	1	0	1
7	1	1	1	1

Minitérminos

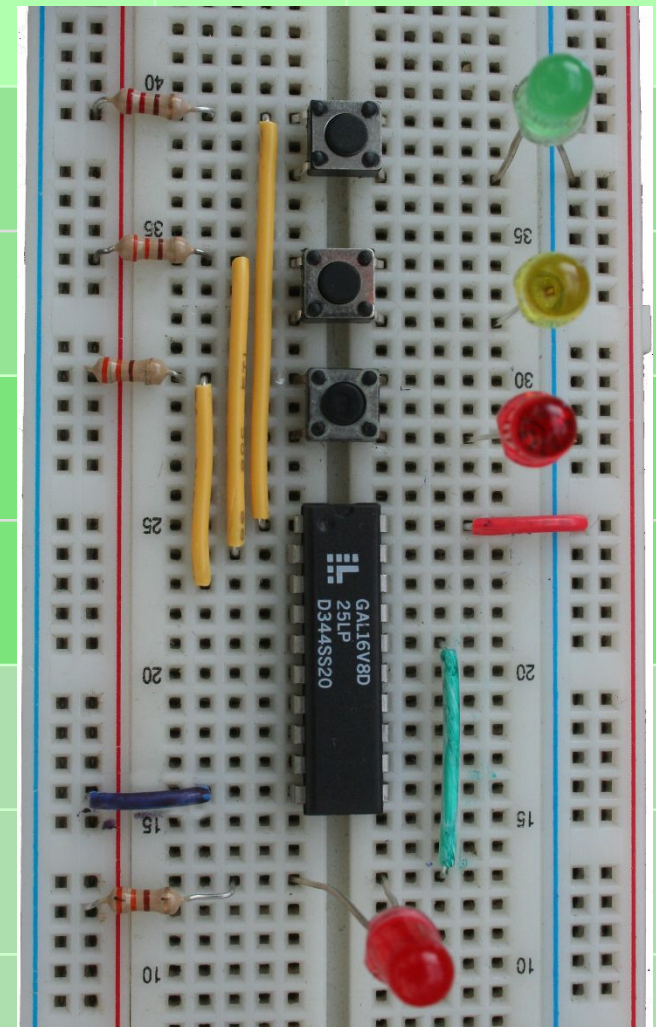
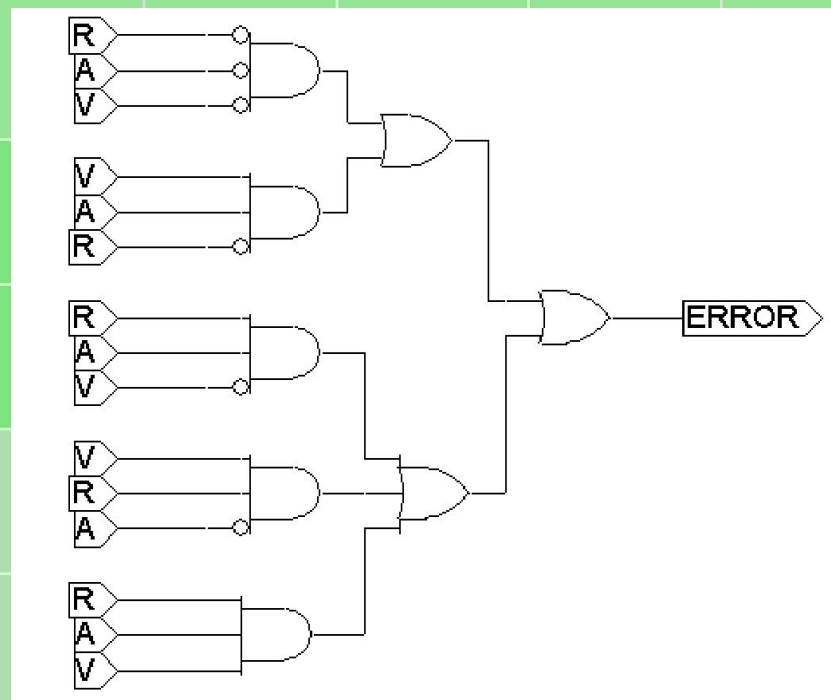
Método
Analítico



Circuito

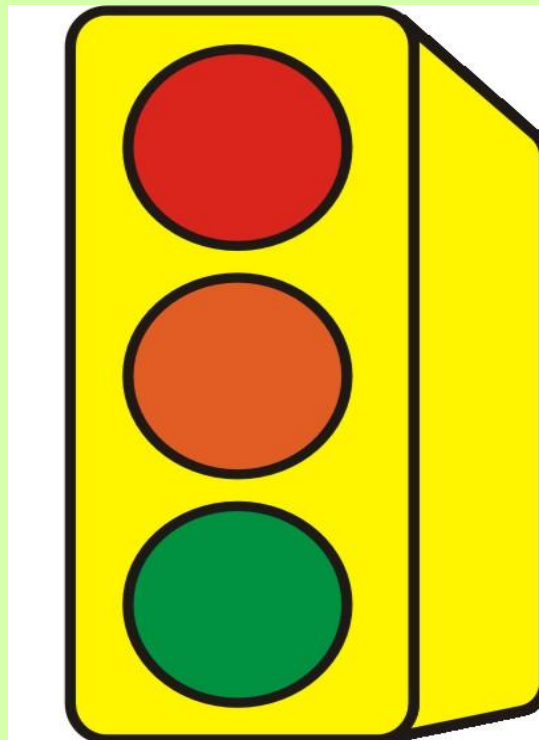
$$F_{E(R,A,V)} = \bar{R} \bar{A} \bar{V} + \bar{R} A \bar{V} + R \bar{A} V + R A \bar{V} + R A V$$

Ecuación

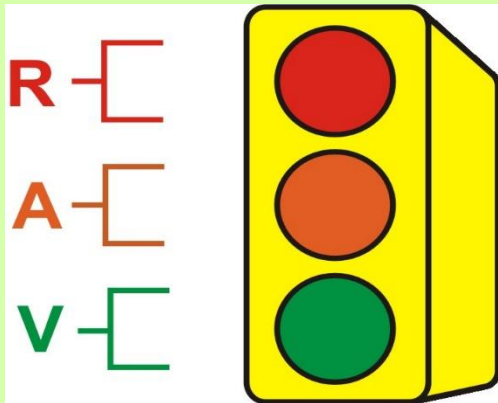


Detector de errores de un semáforo

**se considera error cuando
no enciende **ninguna luz**
o encienden **mas de una luz a la vez****



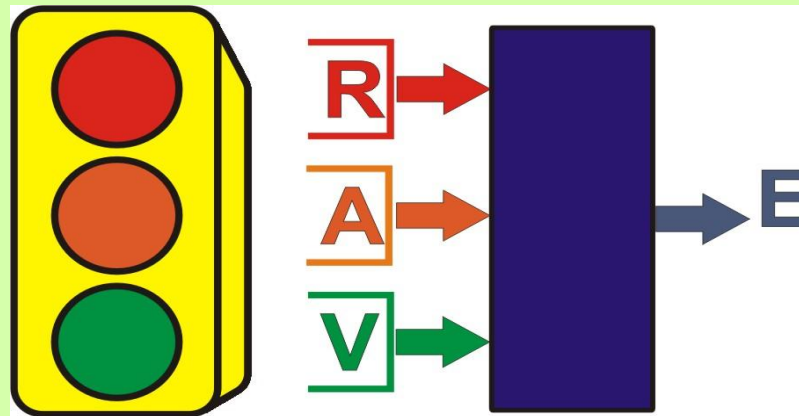
Detector de errores de un semáforo



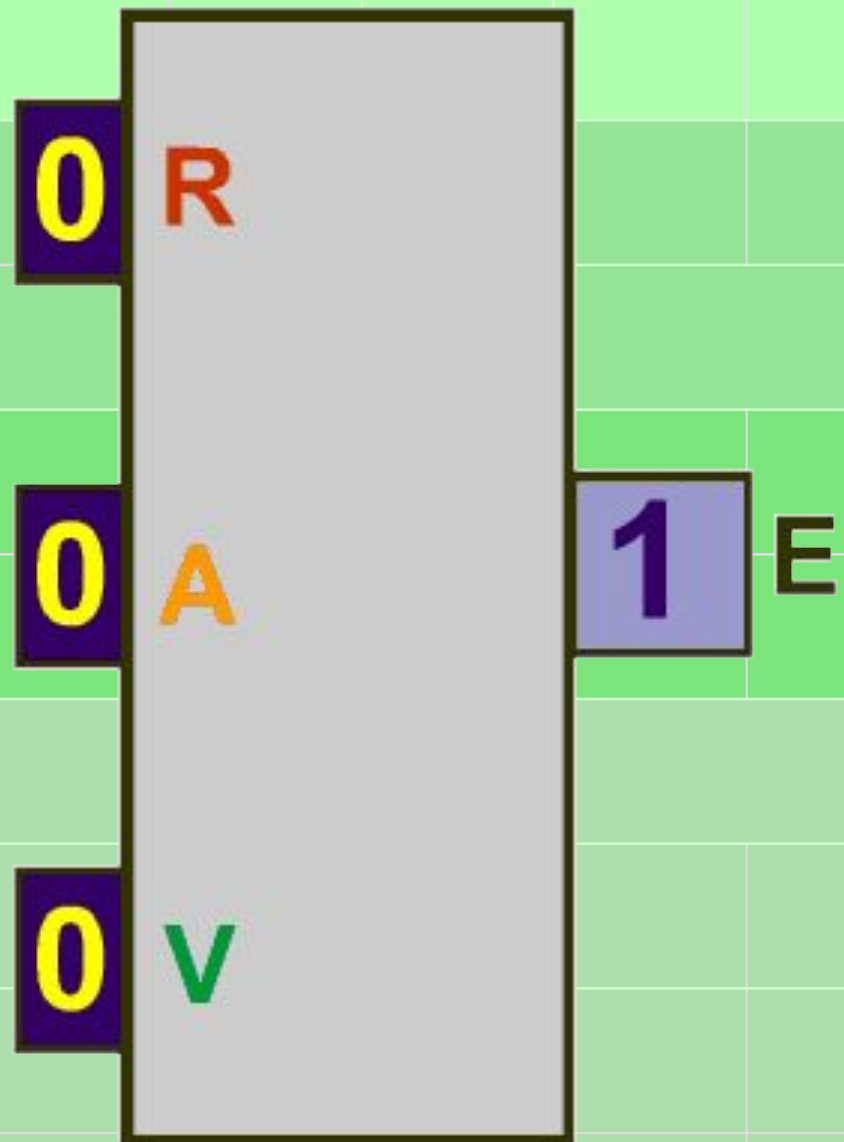
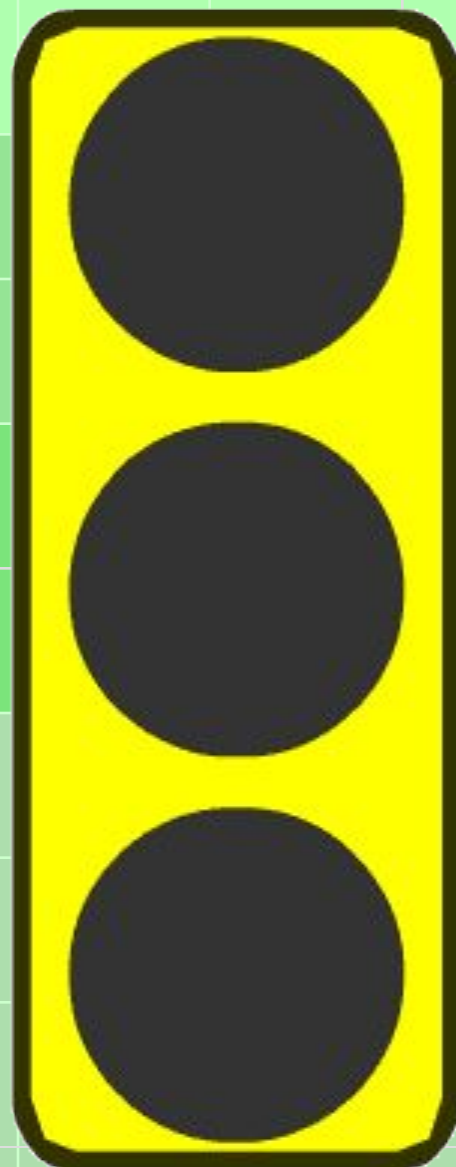
Se colocan fotoceldas para detectar el estado de cada luz de modo que:

Si enciende el foco la fotocelda emite un uno y si el foco esta apagado la fotocelda emite un cero

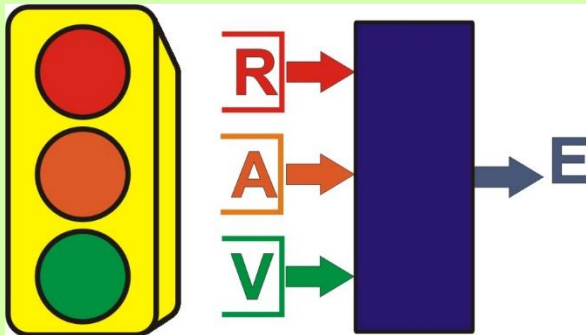
Detector de errores de un semáforo



Cuando el sistema detecte un error la salida $E=1$



Detector de errores de un semáforo



m	R	A	V	E
0	0	0	0	1
1	0	0	1	0
2	0	1	0	0
3	0	1	1	1
4	1	0	0	0
5	1	0	1	1
6	1	1	0	1
7	1	1	1	1



UANL

Forma
SOP
Suma de
Productos

m	R	A	V	E
0	0	0	0	1
1	0	0	1	0
2	0	1	0	0
3	0	1	1	1
4	1	0	0	0
5	1	0	1	1
6	1	1	0	1
7	1	1	1	1

$$F_{E(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}AV + R\bar{A}V + RA\bar{V} + RAV$$

m	R	A	V	E
0	0	0	0	1
1	0	0	1	0
2	0	1	0	0
3	0	1	1	1
4	1	0	0	0
5	1	0	1	1
6	1	1	0	1
7	1	1	1	1

Forma Canónica

$$F_{E(R,A,V)} = \sum m(0,3,5,6,7)$$

Forma SOP

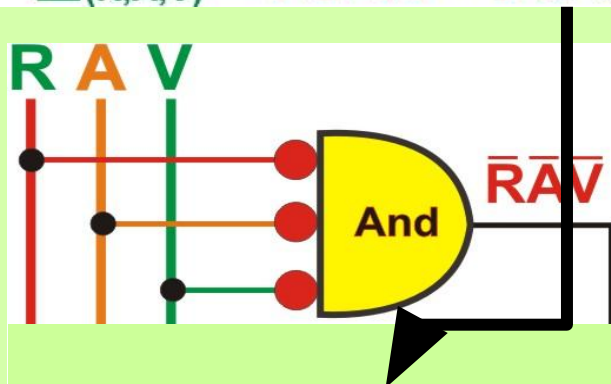
$$F_{E(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}A\bar{V} + R\bar{A}\bar{V} + R\bar{A}V + RAV$$

$$F_{E(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}A\bar{V} + R\bar{A}\bar{V} + R\bar{A}V + RAV$$



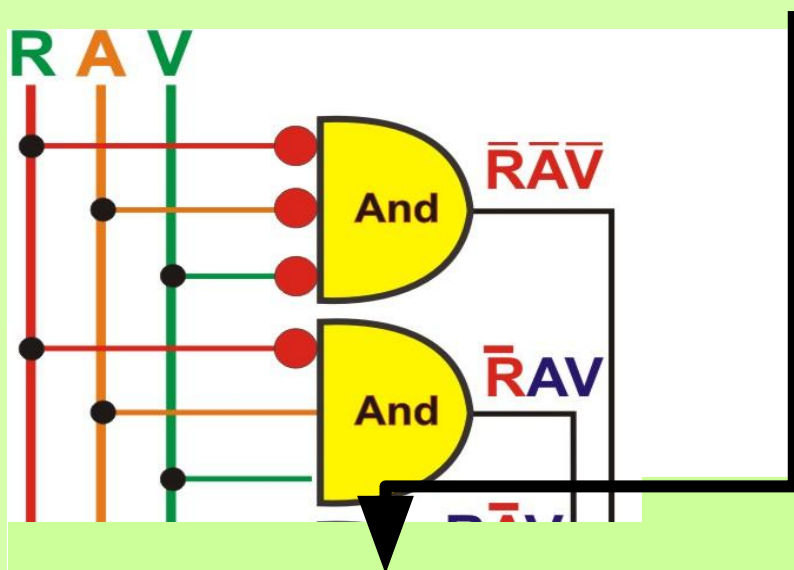
Circuito

$$F_{E(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}A\bar{V} + R\bar{A}\bar{V} + R\bar{A}V + RAV$$



Circuito

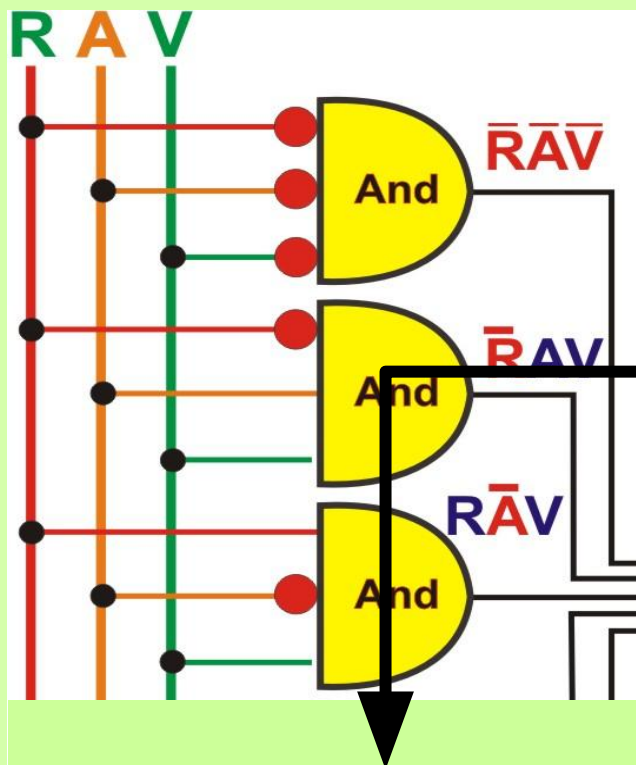
$$F_{E(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}A\bar{V} + R\bar{A}\bar{V} + R\bar{A}V + RAV$$



Circuito

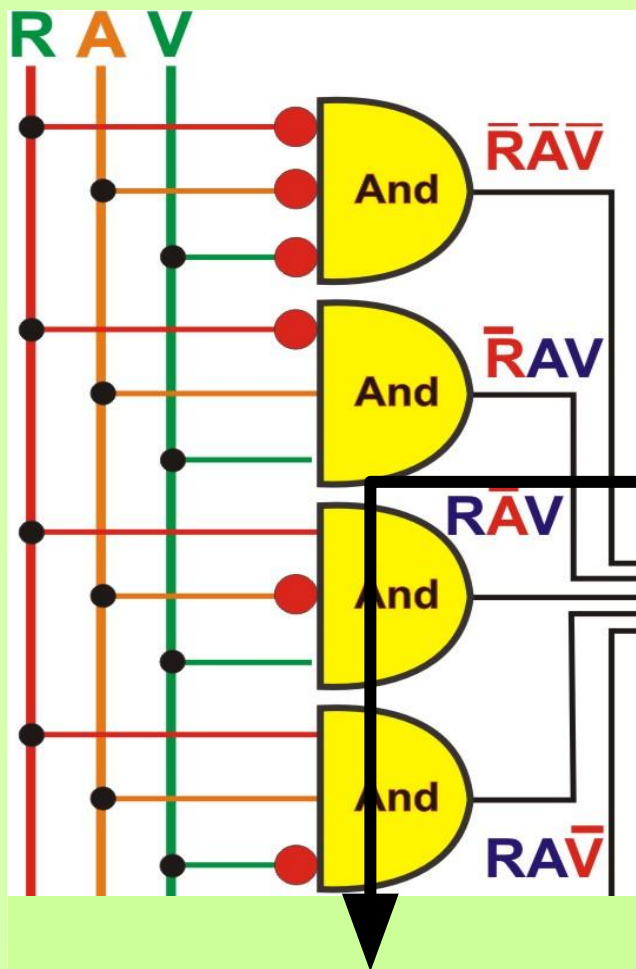
$$F_{E(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}A\bar{V} + R\bar{A}\bar{V} + R\bar{A}\bar{V} + RAV$$

Circuito



$$F_{E(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}A\bar{V} + R\bar{A}\bar{V} + RA\bar{V} + RAV$$

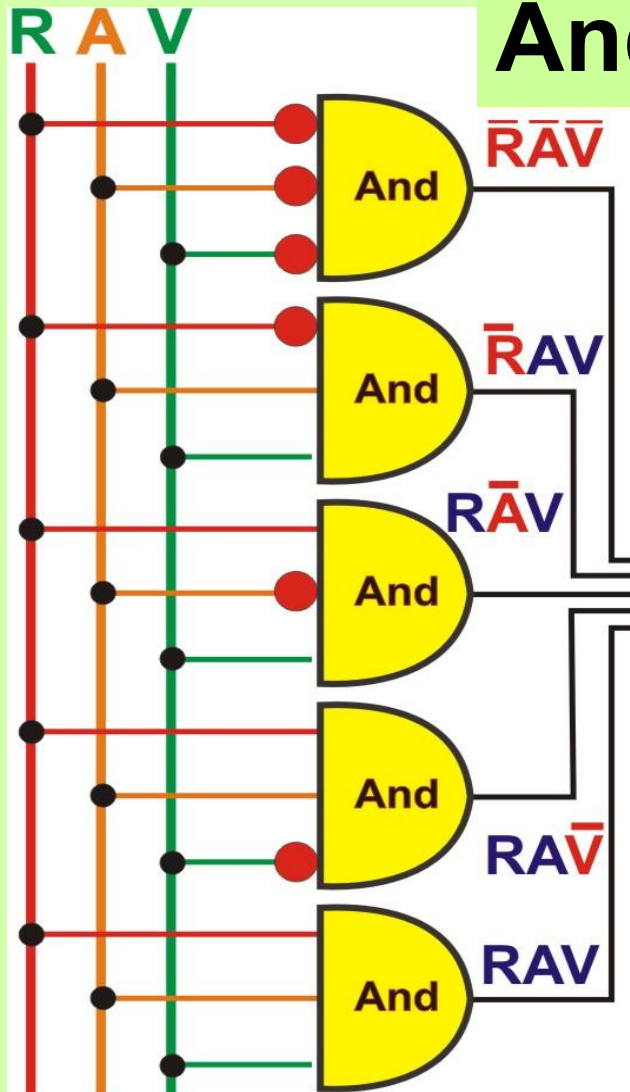
Circuito



$$F_{E(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}A\bar{V} + R\bar{A}\bar{V} + RA\bar{V} + RAV$$

And/Or

Circuito

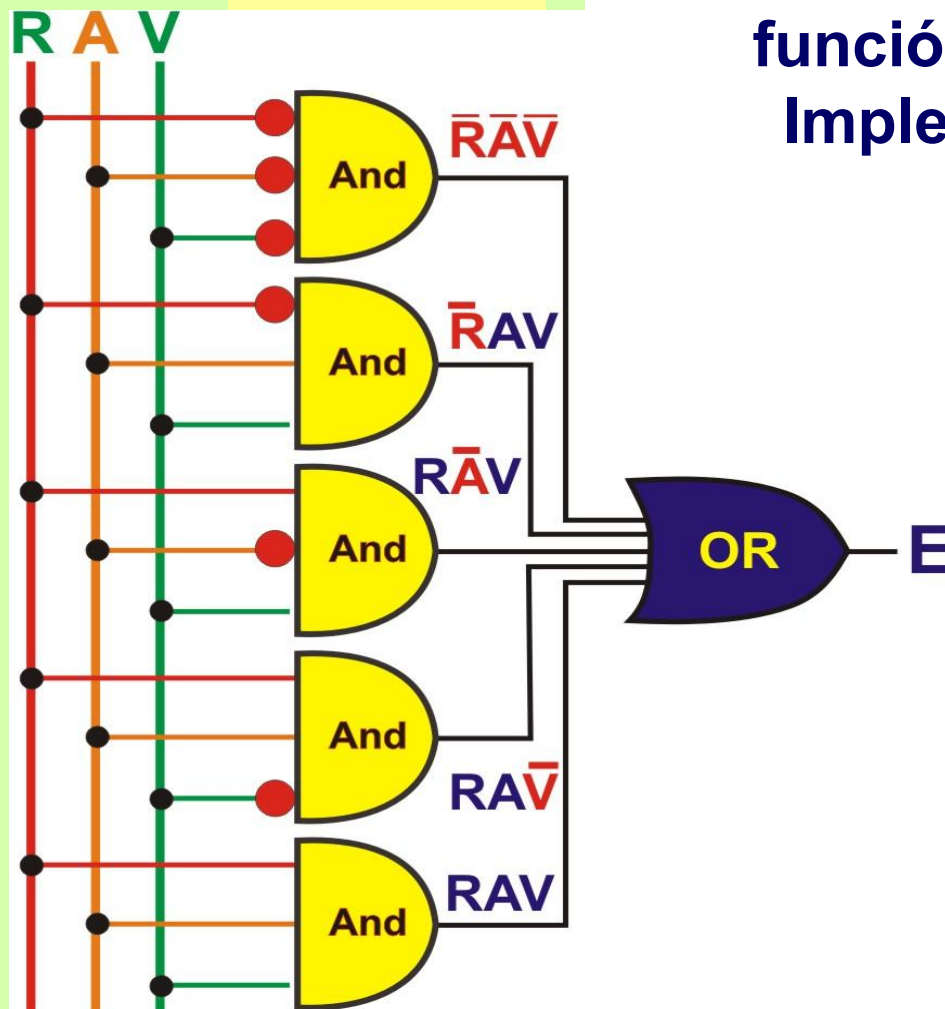




$$F_{E(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}A\bar{V} + R\bar{A}\bar{V} + RA\bar{V} + RAV$$

Circuito

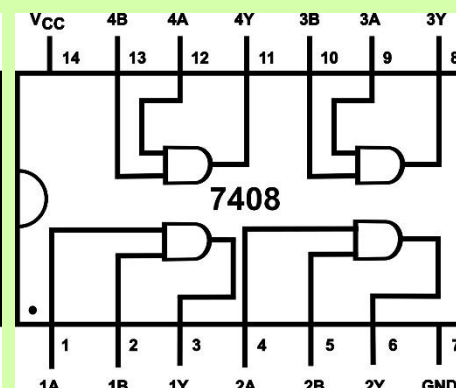
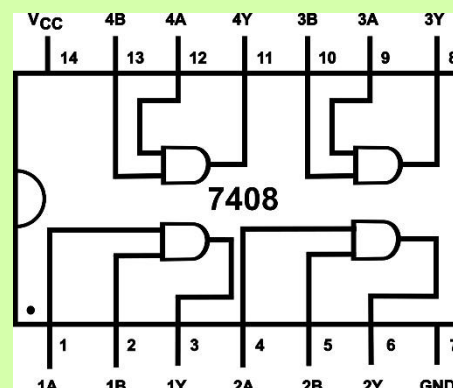
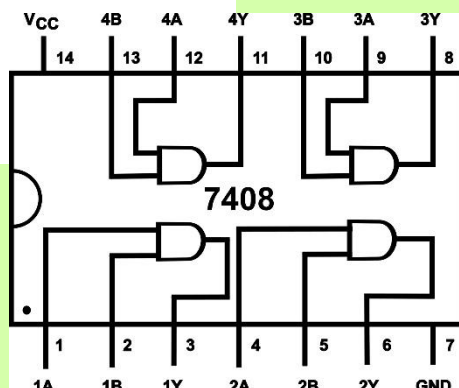
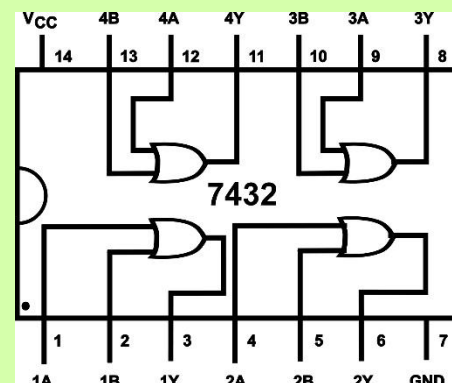
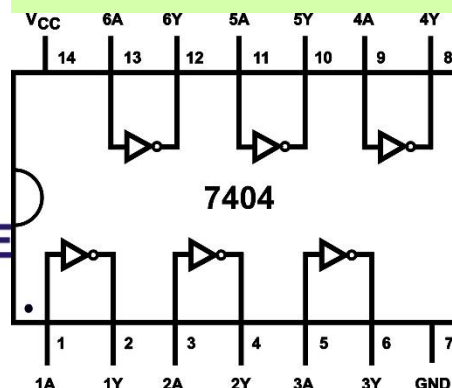
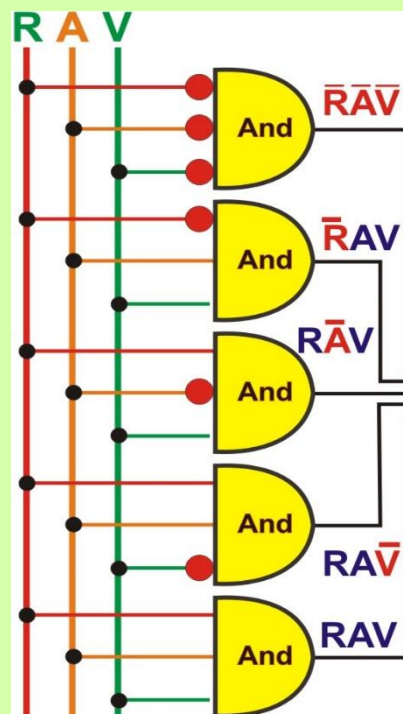
Cuantos circuitos Integrados TTL de función fija se requieren para Implementar este circuito ?



$$F_{E(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}A\bar{V} + R\bar{A}\bar{V} + R\bar{A}V + RAV$$

Circuito

¿Cuántos circuitos Integrados TTL de función fija se requieren para Implementar este circuito ?

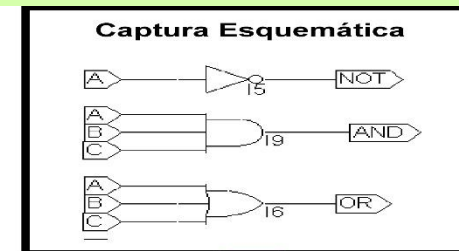


5 X 25 = \$125

Captura Esquemática PLD



aprox= \$70



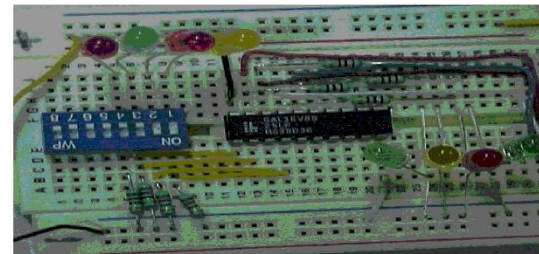
SCH



JEDEC

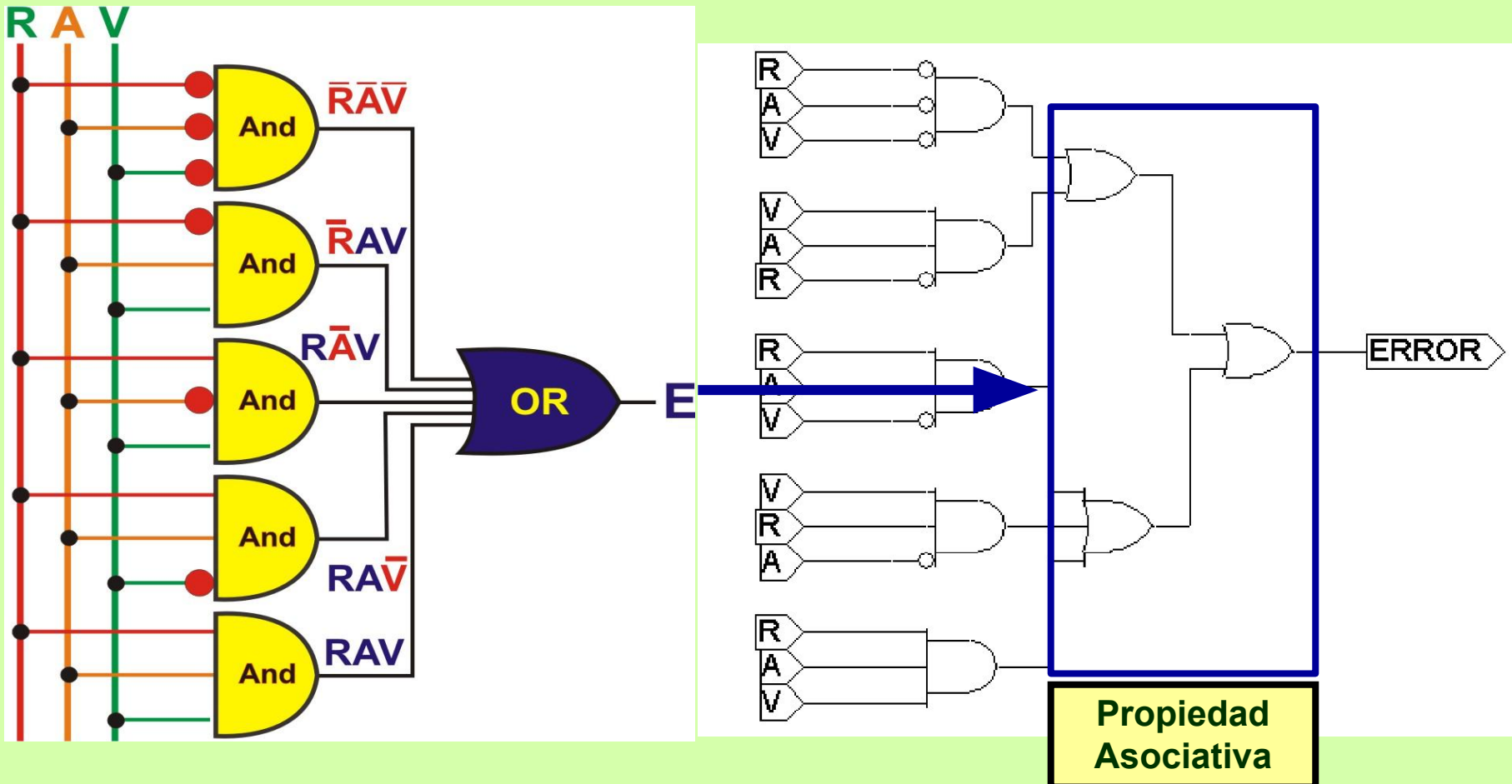


Circuito



$$FE_{(R,A,V)} = \bar{R}\bar{A}\bar{V} + \bar{R}A\bar{V} + R\bar{A}\bar{V} + RA\bar{V} + RAV$$

Circuito



IspLEVER Classic



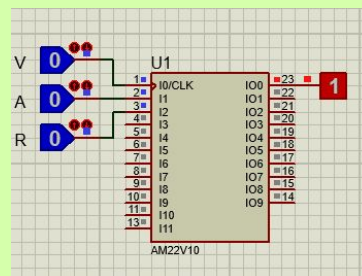
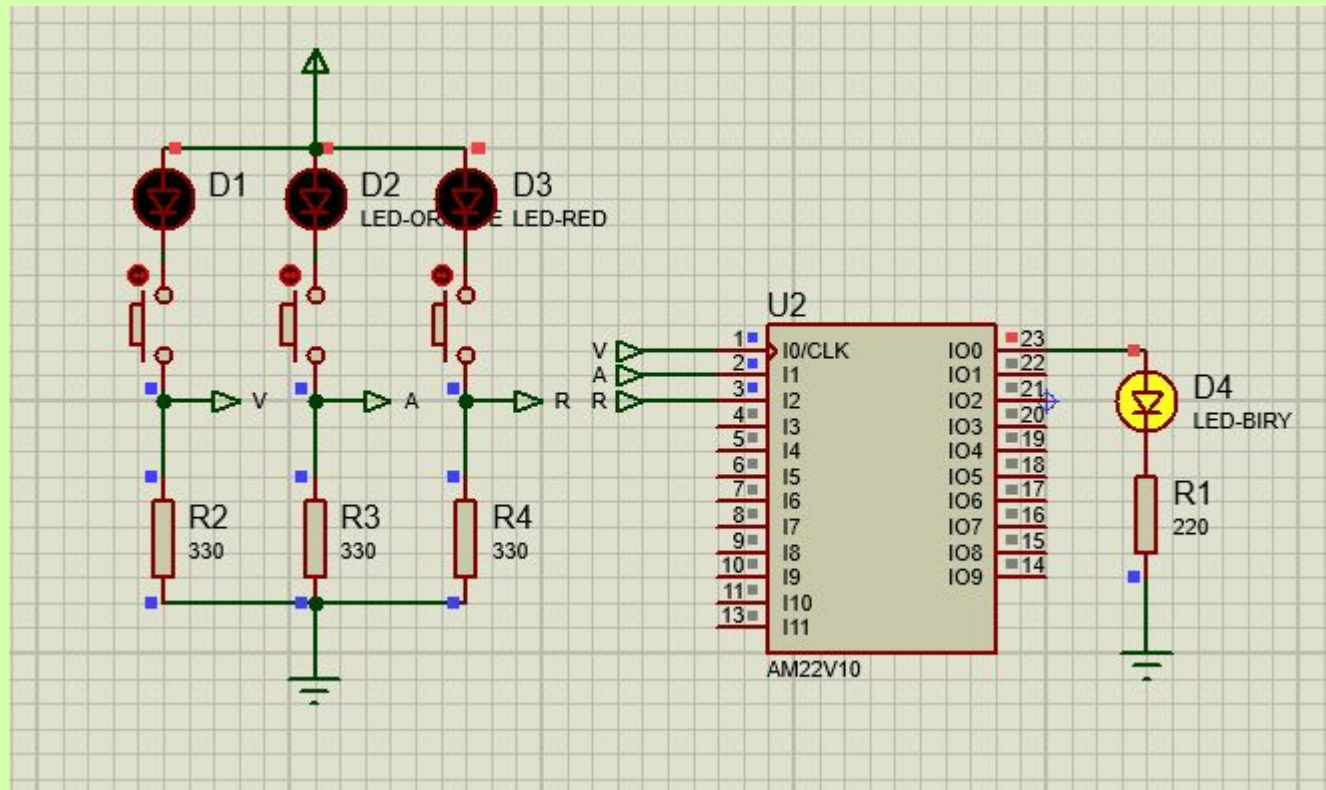
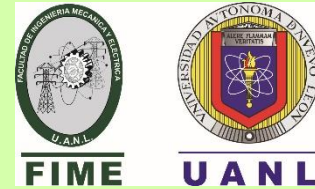
Diseño y Simulación de sistemas digitales
Dispositivos Lógicos Programables
PLD

Captura Esquemática

HDL

Lenguaje de descripción de Hardware

Simulación en PROTEUS





Método para detectar y corregir fallas

Detección y corrección de fallas

