

Experimento 1

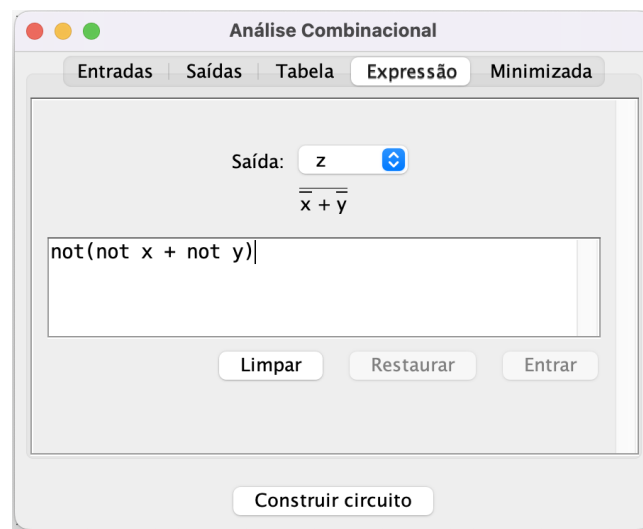
Yan Tavares de Oliveira
202014323

Questão 1

a)

O teorema de De Morgan diz que $\overline{x + y} = \bar{x} \cdot \bar{y}$. Por outro lado, sabemos que $\bar{\bar{x}} = x$.
Portanto, $\overline{\bar{x} + \bar{y}} = x \cdot y$.

Expressão



Circuito

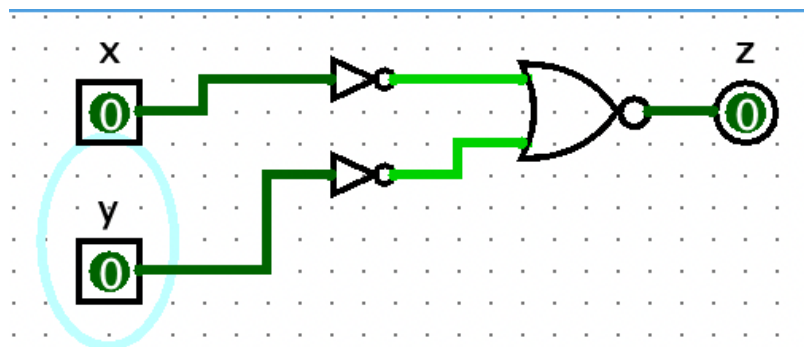


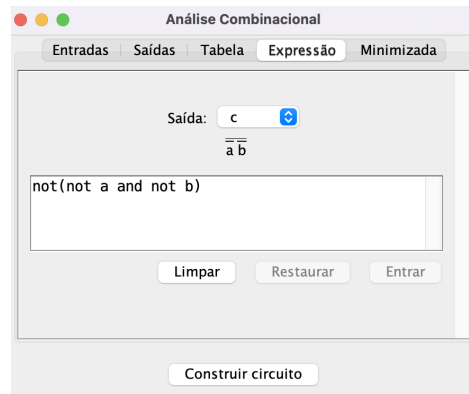
Tabela verdade

x	y	z
0	0	0
0	1	0
1	0	0
1	1	1

b)

O teorema de De Morgan diz que $\overline{a \cdot b} = \bar{a} + \bar{b}$. Por outro lado, sabemos que $\bar{\bar{a}} = a$. Portanto, $\overline{\bar{a} \cdot \bar{b}} = a + b$.

Expressão



Circuito

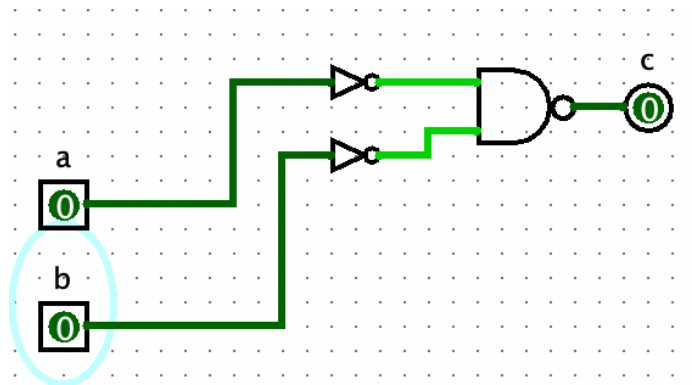


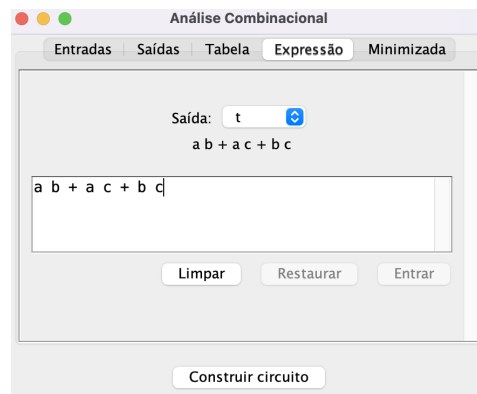
Tabela verdade

a	b	x
0	0	0
0	1	1
1	0	1
1	1	1

Questão 2

a)

Expressão



Circuito

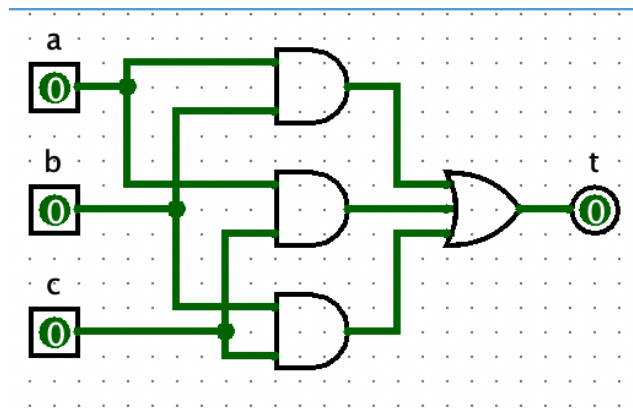
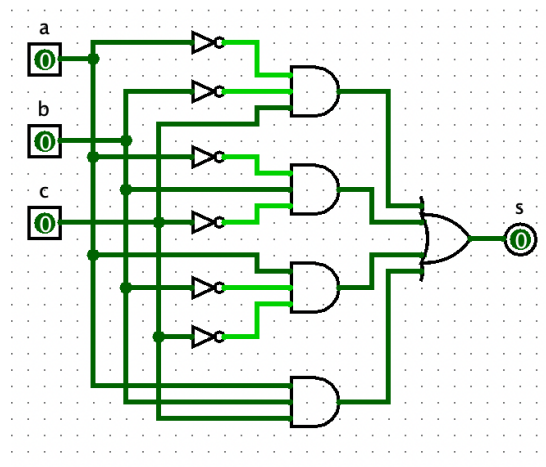


Tabela verdade

a	b	c	t
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

b)

Circuito



Expressão

Análise Combinacional

Entradas Saídas Tabela Expressão Minimizada

Saída: s

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

not a not b c + not a b not c + a not b not c + a b c

Limpar Restaurar Entrar

Construir circuito

Tabela verdade

a	b	c	s
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Questão 3

Sabemos que, graças ao Teorema de Morgan, é possível escrever qualquer circuito lógico utilizando portas NAND ou NOR. Portanto, podemos escrever os circuitos do item 2 como

a)

Expressão

The screenshot shows a window titled "Análise Combinacional" with five tabs: "Entradas", "Saídas", "Tabela", "Expressão", and "Minimizada". The "Expressão" tab is selected. In the "Saída:" field, the letter "t" is entered. Below it, the expression $\overline{\overline{a} b a c \overline{b} c}$ is displayed. A text box contains the logical expression $\sim(\sim(a b) \sim(a c) \sim(b c))$. At the bottom of the window, there are three buttons: "Limpar", "Restaurar", and "Entrar". Below the window, there is a button labeled "Construir circuito".

Circuito

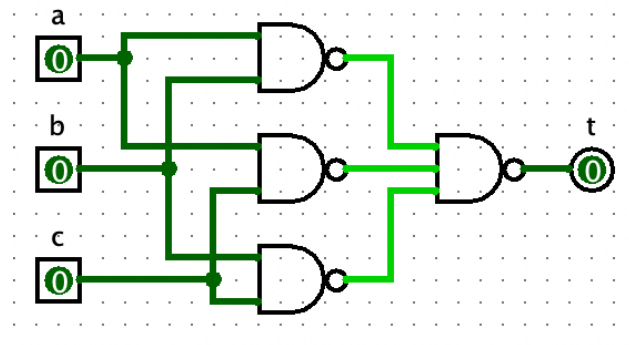
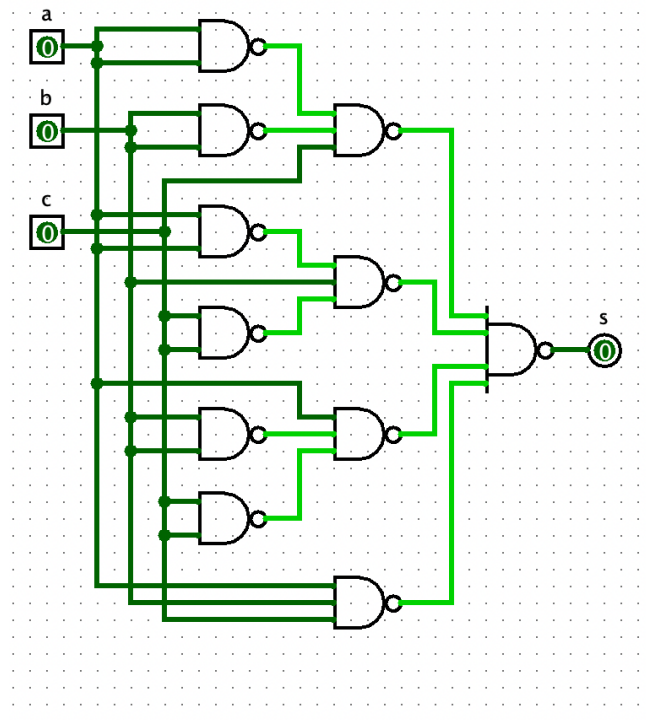


Tabela verdade

a	b	c	t
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

b)

Circuito



Expressão

Saída:

a a b b c a a b c c a b b c c a b c

$\sim(\sim(\sim(a \ a) \ \sim(b \ b) \ c) \ \sim(\sim(a \ a) \ b \ \sim(c \ c)) \ \sim(a \ \sim(b \ b) \ \sim(c \ c)) \ \sim(a \ b \ c))$

Tabela verdade

a	b	c	s
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Questão 4

Expressão

Saída:

$$\sim(\sim(d0 \sim(s1 \ s1) \sim(s0 \ s0)) \sim(d1 \sim(s1 \ s1) \ s0) \sim(d2 \ s1 \sim(s0 \ s0)) \sim(d3 \ s1 \ s0))$$

Circuito

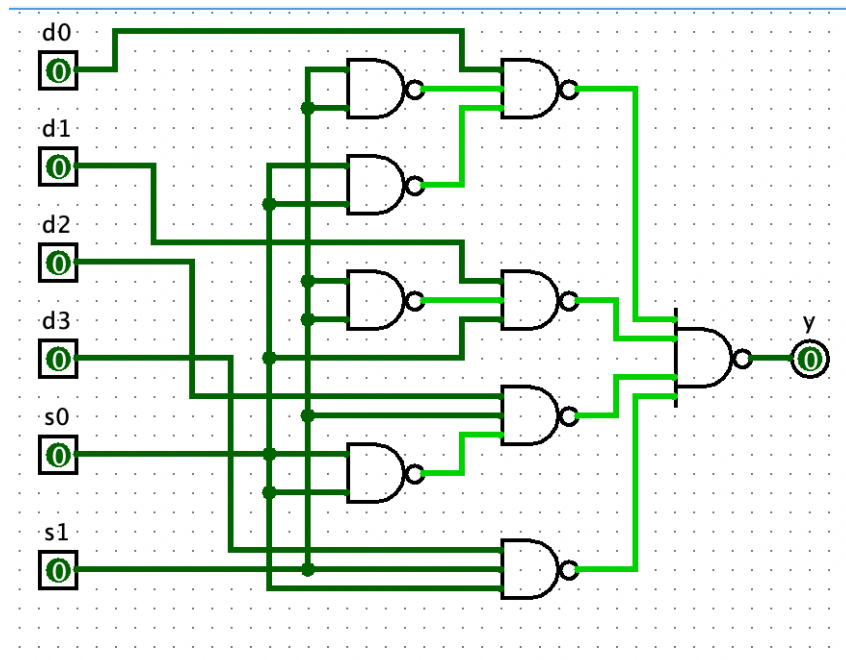


Tabela verdade

A tabela verdade será apresentada nas próximas páginas devido à sua grande extensão

d0	d1	d2	d3	s0	s1	y
0	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	0	0	1	0	0
0	0	0	0	1	1	0
0	0	0	1	0	0	0
0	0	0	1	0	1	0
0	0	0	1	1	0	0
0	0	0	1	1	1	1
0	0	1	0	0	0	0
0	0	1	0	0	1	1
0	0	1	0	1	0	0
0	0	1	0	1	1	0
0	0	1	1	0	0	0
0	0	1	1	0	1	1
0	0	1	1	1	0	0
0	0	1	1	1	1	1
0	1	0	0	0	0	0
0	1	0	0	0	1	0
0	1	0	0	1	0	1
0	1	0	0	1	1	0
0	1	0	1	0	0	0
0	1	0	1	0	1	0
0	1	0	1	1	0	1
0	1	0	1	1	1	1
0	1	1	0	0	0	0
0	1	1	0	0	1	1
0	1	1	0	1	0	1
0	1	1	0	1	1	0
0	1	1	1	0	0	0
0	1	1	1	0	1	1
0	1	1	1	1	0	1
0	1	1	1	1	1	1
1	0	0	0	0	0	1
1	0	0	0	0	1	0
1	0	0	0	1	0	0
1	0	0	0	1	1	0
1	0	0	1	0	0	1
1	0	0	1	0	1	0
1	0	0	1	1	0	0
1	0	0	1	1	1	1
1	0	1	0	0	0	1
1	0	1	0	0	1	1
1	0	1	0	1	0	0
1	0	1	0	1	1	0
1	0	1	1	0	0	1
1	0	1	1	0	1	1

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