03/02/25

Exercícios

Ou

A	B	A + B
0	0	0
0	1	1
1	0	1
1	1	1

E ou .

A	B	A · B
0	0	0
0	1	0
1	0	0
1	1	1

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A	A!
0	1
1	0

Operadores Lógicos na Álgebra Booleana

1. $(A + B) \cdot C$

A	B	C	A + B	A + B · C
1	1	1	1	1
1	1	0	1	0
1	0	1	1	1
1	0	0	1	0
0	1	1	1	1
0	1	0	1	0
0	0	1	0	0
0	0	0	0	0

$A \oplus (B \downarrow C)$

A	B	C	B ↓ C	A ⊕ (B ↓ C)
1	1	1	0	1
1	1	0	0	1
1	0	1	0	1
1	0	0	1	0
0	1	1	0	0
0	1	0	0	0
0	0	1	0	0
0	0	0	1	1

$(A \to B) \cdot (\neg C)$	A	B	C	$A \to B$	$\neg C$	$(A \to B) \cdot (\neg C)$
	1	1	1	1	0	0
	1	1	0	0	1	0
	1	0	1	1	0	0
	1	0	0	0	1	0
	0	1	1	1	0	0
	0	1	0	1	1	1
	0	0	1	1	0	0
	0	0	0	1	1	1

2 - $(A+B) \cdot (A+C) = A + (B \cdot C)$

A	B	C	$(A+B)$	$(A+C)$	$(A+B) \cdot (A+C)$
1	1	1	1	1	1
1	1	0	1	1	1
1	0	1	1	1	1
1	0	0	1	1	1
0	1	1	1	1	1
0	1	0	1	0	0
0	0	1	0	1	0
0	0	0	0	0	0

A	B	C	$(B \cdot C)$	$A + (B \cdot C)$	Equivalência
1	1	1	1	1	1
1	1	0	0	1	1
1	0	1	0	1	1
1	0	0	0	1	1
0	1	1	1	1	1
0	1	0	0	0	1
0	0	1	0	0	1
0	0	0	0	0	1

3. $(A \uparrow B) + (\neg C)$

A	B	C	$(A + B)$	$\neg C$	$(A \uparrow B)$	$(A \uparrow C) + (\neg C)$
1	1	1	1	0	0	0
1	1	0	1	1	0	1
1	0	1	1	0	0	0
1	0	0	1	1	0	1
0	1	1	1	0	0	0
0	1	0	1	1	0	1
0	0	1	0	0	1	1
0	0	0	0	1	1	1

$(A \cdot B) + (\neg A \cdot C)$

A	B	C	$(A \cdot B)$	$(\neg A)$	$(\neg A \cdot C)$	$(A \cdot B) + (\neg A \cdot C)$
1	1	1	1	0	0	1
1	1	0	1	0	0	1
1	0	1	0	0	0	0
1	0	0	0	0	0	0
0	1	1	0	1	1	1
0	1	0	0	1	0	0
0	0	1	0	1	1	1
0	0	0	0	1	0	0

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$(A \oplus B) \cdot (C + D)$

A	B	C	D	$(A \oplus B)$	$(C + D)$	$(A \oplus B) \cdot (C + D)$
1	1	1	1	0	1	0
1	1	1	0	0	1	0
1	1	0	1	0	1	0
1	1	0	0	0	0	0
1	0	1	1	1	1	1
1	0	1	0	1	1	1
1	0	0	1	1	1	1
1	0	0	0	1	0	0
0	1	1	1	1	1	1
0	1	1	0	1	1	1
0	1	0	1	1	1	1
0	1	0	0	1	0	0
0	0	1	1	0	1	0
0	0	1	0	0	1	0
0	0	0	1	0	1	0
0	0	0	0	0	0	0

$\neg(A+B)\cdot(C\downarrow D)$

A	B	C	D	$(A+B)$	$(C\downarrow D)\cdot\neg(A+B)$	$\neg(A+B)\cdot(C\downarrow D)$
1	1	1	1	1	0	0
1	1	1	0	1	0	0
1	1	0	1	1	0	0
1	1	0	0	1	0	0
1	0	1	1	1	0	0
1	0	1	0	1	0	0
1	0	0	1	1	0	0
1	0	0	0	1	0	0
0	1	1	1	1	0	0
0	1	1	0	1	0	0
0	1	0	1	1	0	0
0	1	0	0	1	0	0
0	0	1	1	0	1	0
0	0	1	0	0	1	0
0	0	0	1	0	1	0
0	0	0	0	0	1	1

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$(A \to B) + (\neg C \to D)$

A	B	C	D	$(A \to B)$	$\neg C$	$(\neg C \to D)$	$(A \to B) + (\neg C \to D)$
1	1	1	1	1	0	1	1
1	1	1	0	1	0	1	1
1	1	0	1	1	1	1	1
1	1	0	0	1	1	0	1
1	0	1	1	0	0	1	1
1	0	1	0	0	0	1	1
1	0	0	1	0	1	1	1
1	0	0	0	0	1	0	0
0	1	1	1	1	0	1	1
0	1	1	0	1	0	1	1
0	1	0	1	1	1	1	1
0	1	0	0	1	1	0	1
0	0	1	1	1	0	1	1
0	0	1	0	1	0	1	1
0	0	0	1	1	1	1	1
0	0	0	0	1	1	0	1

$(A+B+C)\cdot(A \uparrow D)$

A	B	C	D	$(A+B+C)$	$(A+D)$	$(A \uparrow D)$
1	1	1	1	1	1	0
1	1	1	0	1	1	0
1	1	0	1	1	1	0
1	1	0	0	1	1	0
1	0	1	1	1	1	0
1	0	1	0	1	1	0
1	0	0	1	1	1	0
1	0	0	0	1	1	0
0	1	1	1	1	1	0
0	1	1	0	1	0	1
0	1	0	1	1	1	0
0	1	0	0	1	0	1
0	0	1	1	1	1	0
0	0	1	0	1	0	1
0	0	0	1	0	1	0
0	0	0	0	0	0	1