Computer Architecture: Gates and Wires

Truth tables

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Truth Tables to Boolean Algebra

INPUTS		OUT
A	B	R
0	0	0
0	1	1
1	0	1
1	1	0

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(!A).B

A.(!B)

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(!A).B

A.(!B)

(!A).B + A.(!B) = R

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1	0	1
1	1	0

A = 0, B = 0: (!0).0 + 0.(!0) = 1.0 + 0.1 = 0 + 0 = 0

A = 0, B = 1: (!0).1 + 0.(!1) = 1.1 + 0.0 = 1 + 0 = 1

A = 1, B = 0: (!1).0 + 1.(!0) = 0.0 + 1.1 = 0 + 1 = 1

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Every truth table can be converted to a sum of products!

Boolean Algebra to Circuit

(!A).B + A.(!B) = R

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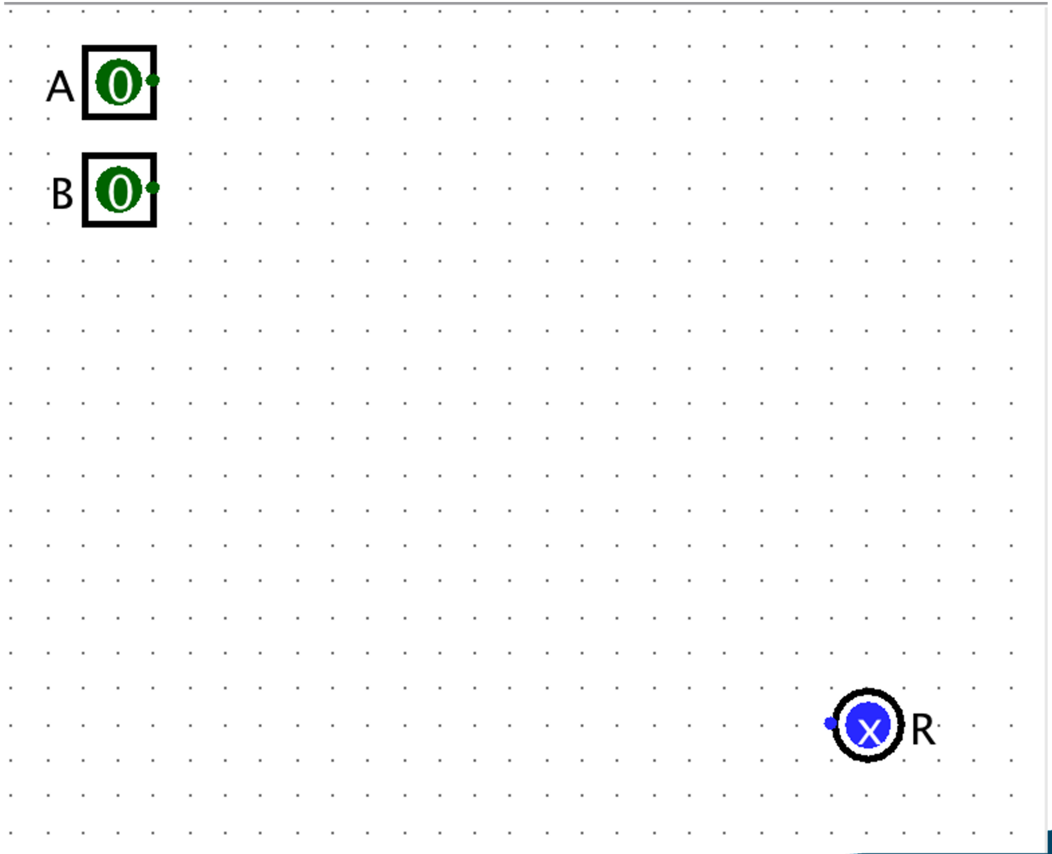

Boolean Algebra to Circuit

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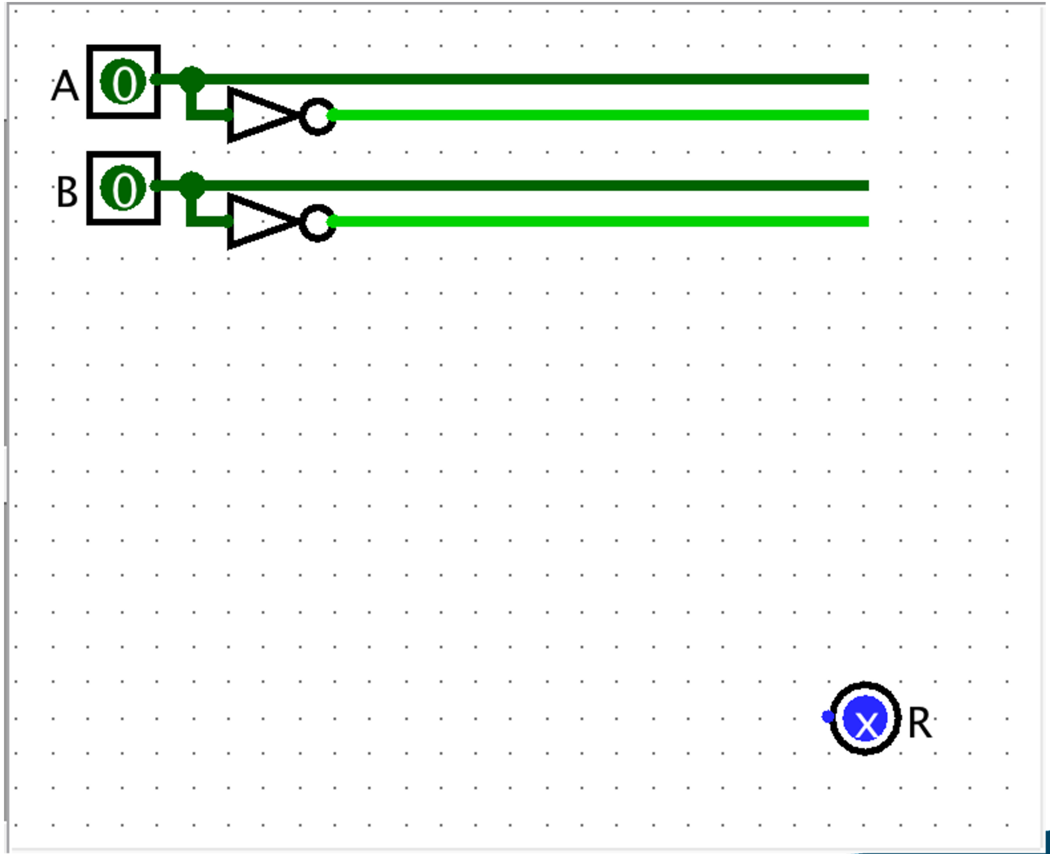

Boolean Algebra to Circuit

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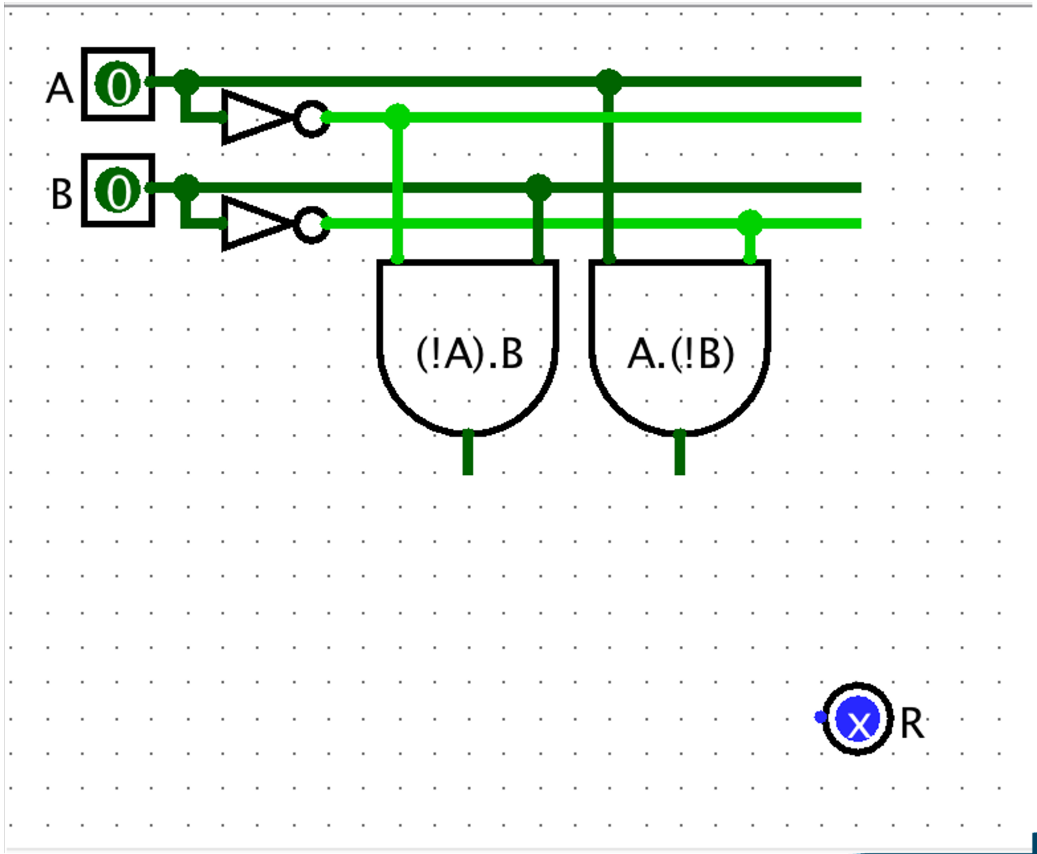

Boolean Algebra to Circuit

(!A).B + A.(!B) = R