

Task 1:

NAND to $A \rightarrow \square \rightarrow (A.A)' = A'$ NOT $A \rightarrow \square \rightarrow A'$

A	(A.A)	(A.A)'
0	0	1
1	1	0

A	A'
0	1
1	0

NAND to $(A.B)'$ AND $(A.B)'' = A.B$

A	B	(A.B)'	(A.B)'' = A.B
0	0	1	0
0	1	1	0
1	0	1	0
1	1	0	1

A	B	A.B
0	0	0
0	1	0
1	0	0
1	1	1

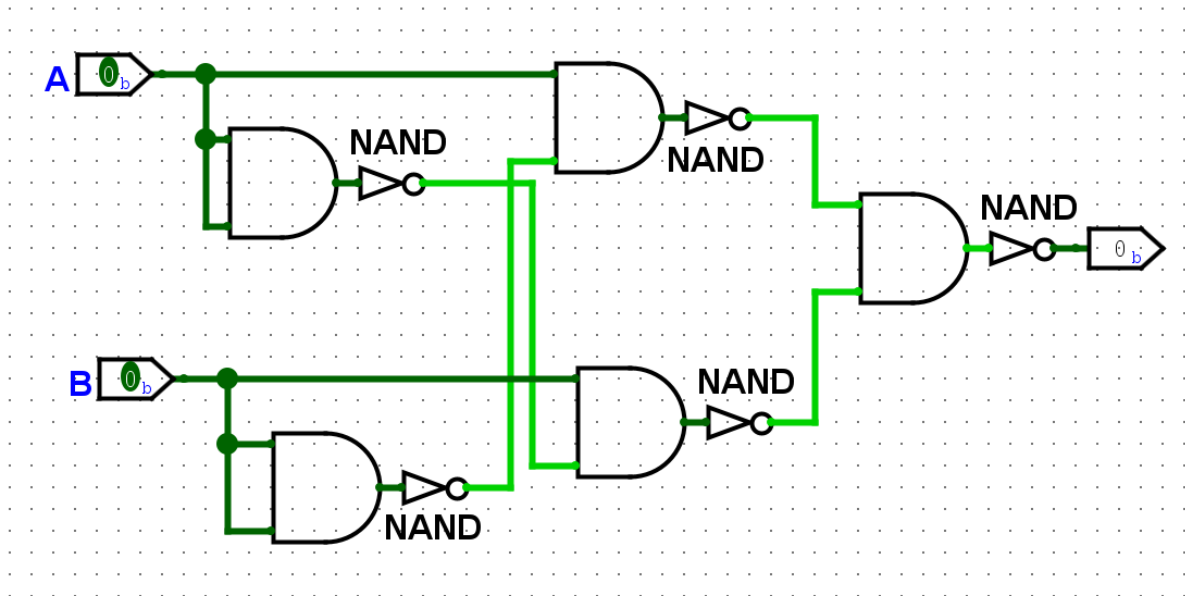
NAND to $(A.B)'$ $(A.B)'' = \overline{\overline{A.B}} = A.B$

A	B	A'	B'	(A'.B')' = A+B
0	0	1	1	1
0	1	1	0	1
1	0	0	1	1
1	1	0	0	0

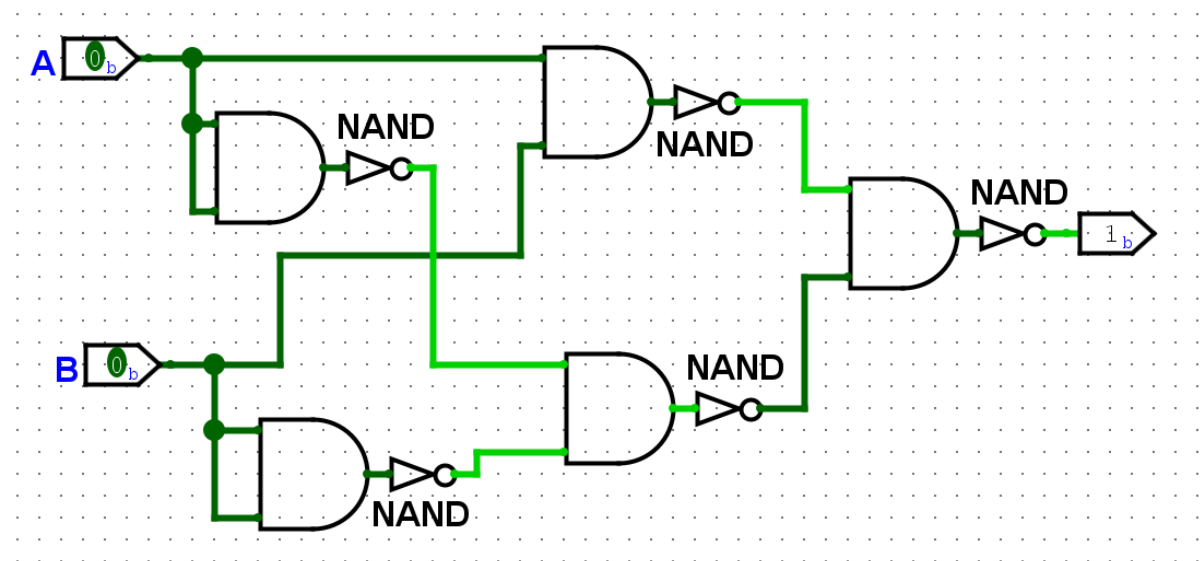
A	B	A+B
0	0	0
0	1	1
1	0	1
1	1	1

Task 2:

NAND to XOR



NAND to XNOR



Proof

NAND \rightarrow XOR
 $AB' + A'B$

$$\overline{\overline{AB' + A'B}} = \overline{AB' \cdot A'B}$$

NAND \rightarrow NOR

$$\overline{\overline{A'B' + AB}}$$

$$\overline{\overline{A'B \cdot AB}}$$