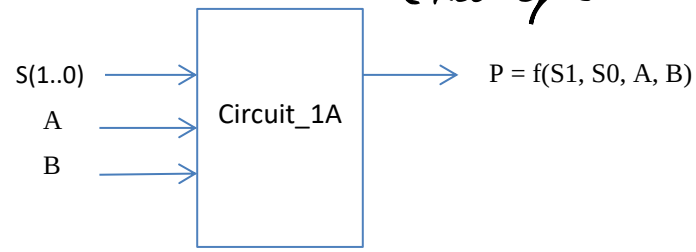
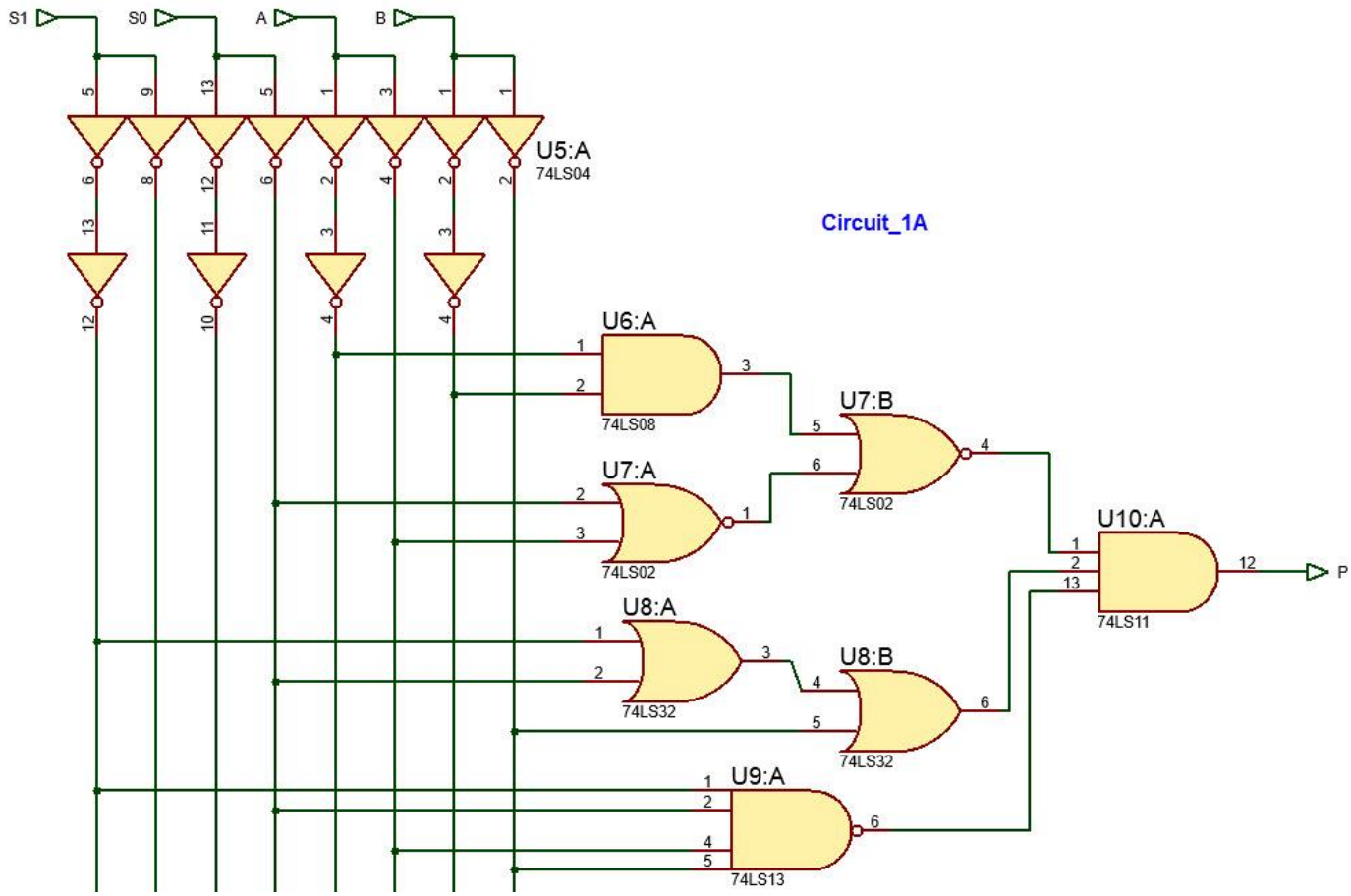
Circuit's symbol:

Example circuit (method II)





Circuit 1A: Let's deduce the output P = f(S1, S0, A, B) = ((A·B) + (S0' + A')')' · (S1 + S0' + B') · (S1·S0'·A'·B')'

WolframAlpha:

truth table (not(A and B or not(not(S0) or not(A)))) and(S1 or not(S0) or not(B)) and (not(S1 and not(S0) and not(A) and not(B)))

Equations and interpretation:

Truth table:

A	B	S0	S1	$\neg((A \wedge B) \vee \neg(\neg S0 \vee \neg A)) \wedge (S1 \vee \neg S0 \vee \neg B) \wedge \neg(S1 \wedge \neg S0 \wedge \neg A \wedge \neg B)$	(S1 S0 A B)
T	T	T	T	F	1 1 1 1 ==> M15
T	T	T	F	F	0 1 1 1 --> M7
T	T	F	T	F	1 0 1 1 --> M11
T	T	F	F	F	0 0 1 1 --> M3
T	F	T	T	F	1 1 1 0 --> M14
T	F	T	F	F	0 1 1 0 --> M6
T	F	F	T	T	1 0 1 0 --> m10
T	F	F	F	T	0 0 1 0 --> m2
F	T	T	T	T	1 1 0 1 --> m13
F	T	T	F	F	0 1 0 1 --> M5
F	T	F	T	T	1 0 0 1 --> m9
F	T	F	F	T	0 0 0 1 --> m1
F	F	T	T	T	1 1 0 0 --> m12
F	F	T	F	T	0 1 0 0 --> m4
F	F	F	T	F	1 0 0 0 --> M8
F	F	F	F	T	0 0 0 0 --> m0

different order !!

In order to write down the minterms or maxterms, let's order the variables as P = *f*(S1, S0, A, B), so:

$$P = f(S1, S0, A, B) = \prod_4 M(3,5,6,7,8,11,14,15) = \sum_4 m(0,1,2,4,9,10,12,13)$$

check with other methods