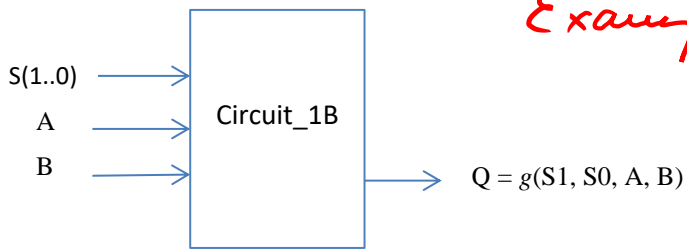
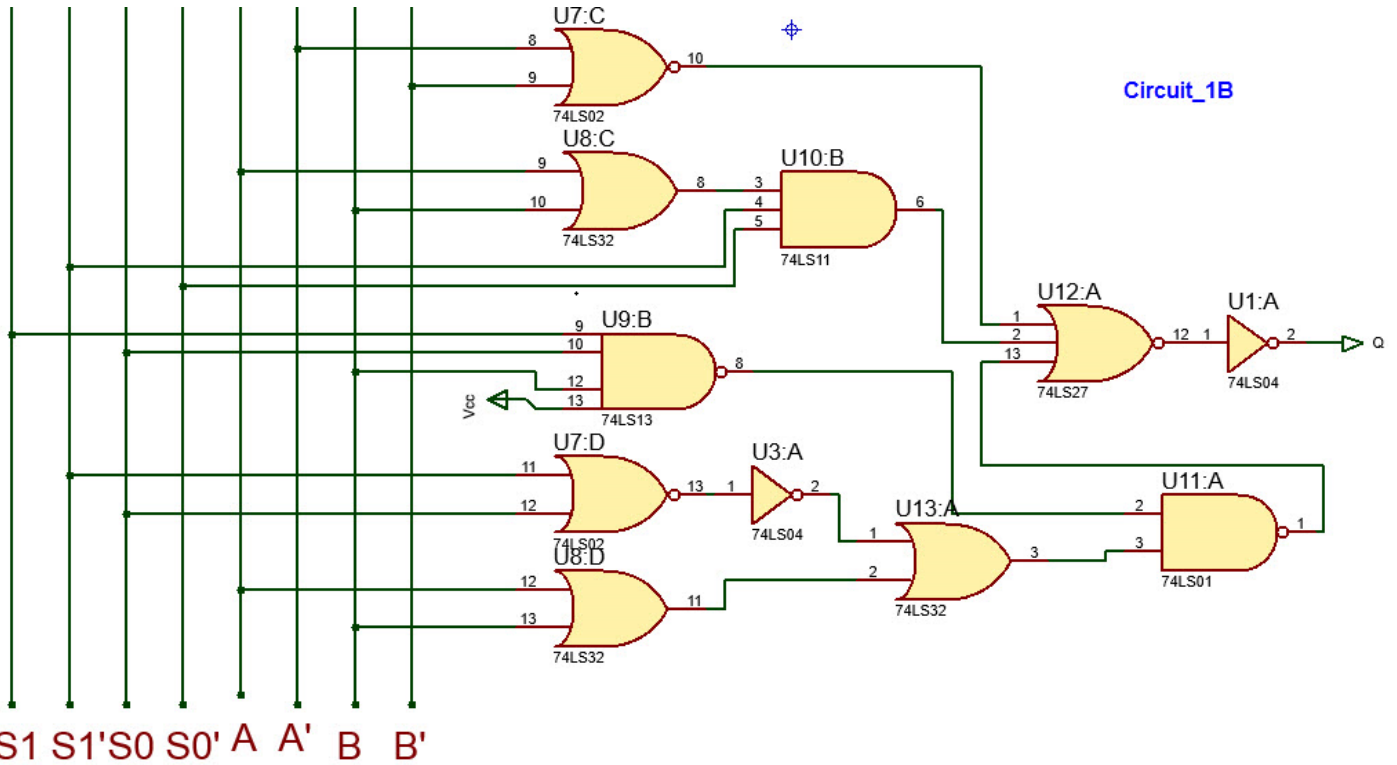


Circuit's symbol:



Example circuit

Method II and III



Circuit 1B: Let's deduce the output $Q = g(S1, S0, A, B) = (A'+B') + S1' \cdot S0' \cdot (A+B) + ((S1 \cdot S0 \cdot B)' \cdot (S1' + S0 + A + B))'$

[WolframAlpha](#):

truth table $\text{not}(\text{not}(A) \text{ or } \text{not}(B)) \text{ or } ((A \text{ or } B) \text{ and } \text{not}(S1) \text{ and } \text{not}(S0)) \text{ or } \text{not}(\text{not}(S1 \text{ and } S0 \text{ and } B) \text{ and } (\text{not}(S1) \text{ or } S0 \text{ or } A \text{ or } B))$

↑ Input the equation step by step into Wolfram Alpha

different order

A	B	S0	S1	$\neg(\neg A \vee \neg B) \vee ((A \vee B) \wedge \neg S1 \wedge \neg S0) \vee \neg(\neg(S1 \wedge S0 \wedge B) \wedge (\neg S1 \vee S0 \vee A \vee B))$
T	T	T	T	T (S1 S0 A B) 1 1 1 1 ==> m15
T	T	T	F	T 0 1 1 1 --> m7
T	T	F	T	T 1 0 1 1 --> m11
T	T	F	F	T 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	F 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	F 1 0 0 1 --> M9
F	T	F	F	T 0 0 0 1 --> m1
F	F	T	T	F 1 1 0 0 --> M12
F	F	T	F	F 0 1 0 0 --> M4
F	F	F	T	T 1 0 0 0 --> m8
F	F	F	F	F 0 0 0 0 --> M0

rearranged columns

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

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

minterms

The truth table in canonical terms (maxterms)