The Sum-of-products (SOP)

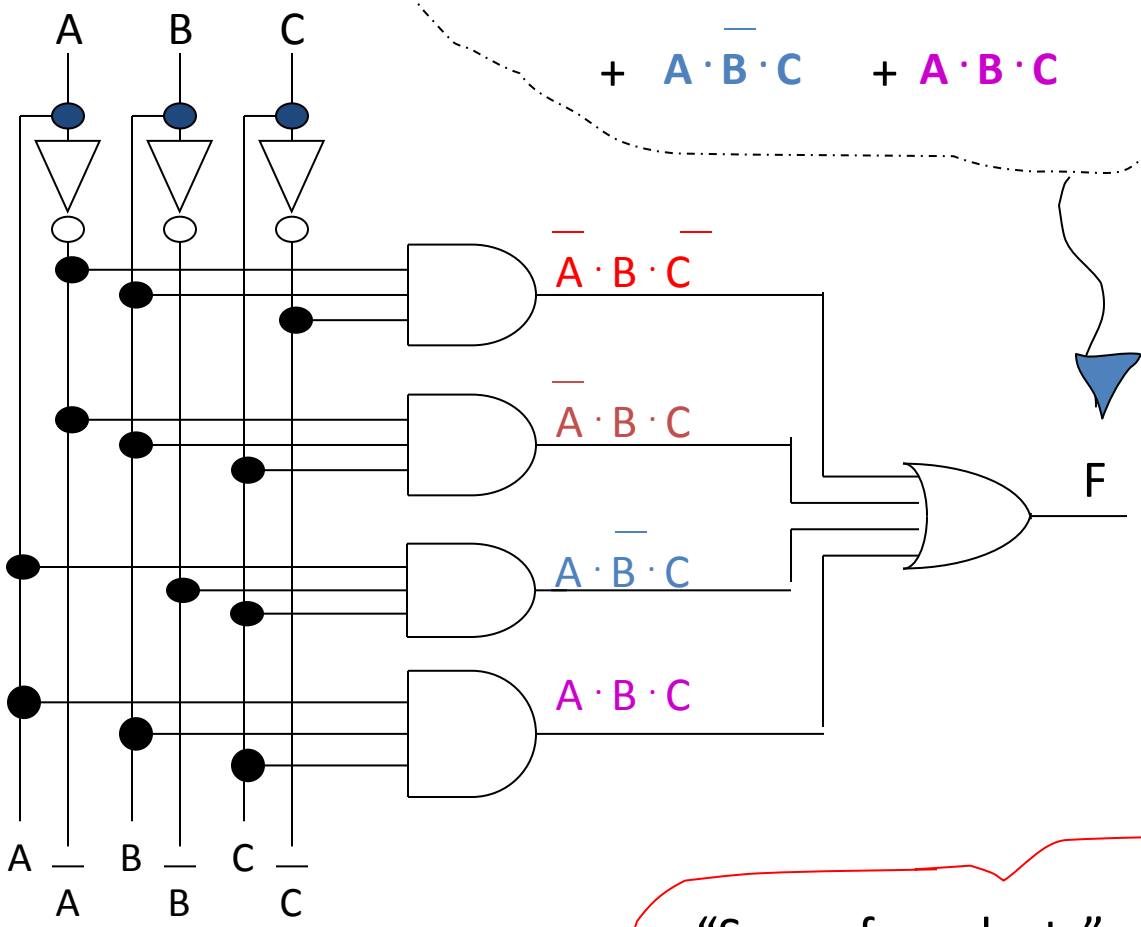
- When two or more multiple terms are sum, the resulting expression is a sum of product(SOP).
  - For example :
    - $F = A + B\,C$
  - It can be obtained from the truth table directly by considering those input combinations that produce a logic '1' at the output

$$F = A\,B\,C + A\,B\,C + A\,B\,C + A\,B\,C + A\,B\,C$$

A	B	C	F	Standard SOP
0	0	0	0	$A\,B\,C$
0	0	1	0	$A\,B\,C$
0	1	0	1	$A\,B\,C$
0	1	1	0	$A\,B\,C$
1	0	0	1	$A\,B\,C$
1	0	1	1	$A\,B\,C$
1	1	0	1	$A\,B\,C$
1	1	1	1	$A\,B\,C$

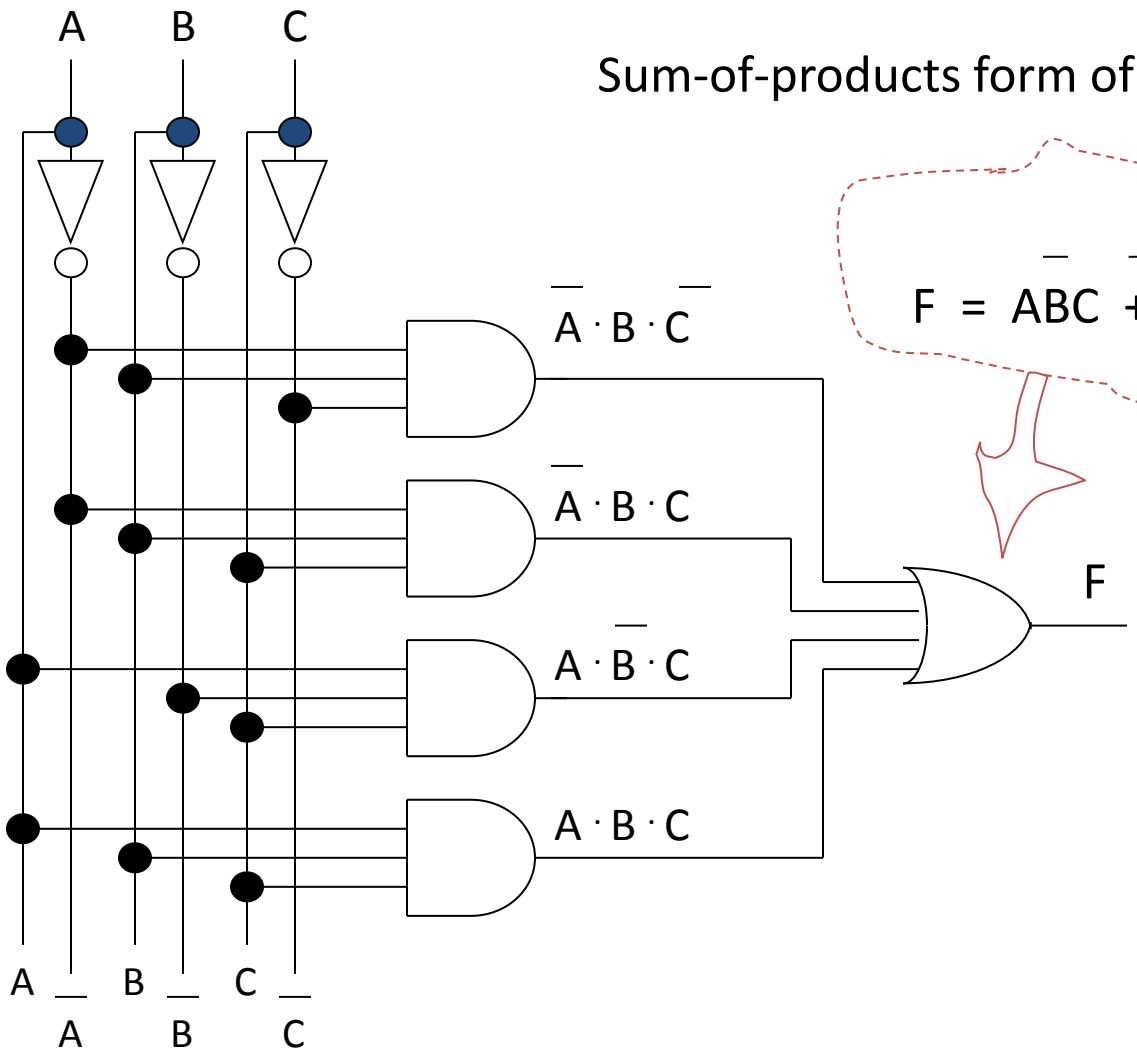
The Sum-of-products (SOP)

A	B	C	F
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1



"Sum-of-products" form of the logic circuit.

Simplifying logic functions using Boolean algebra rules



Sum-of-products form of the logic function:

$$F = \overline{A}BC + A\overline{B}C + AB\overline{C} + ABC$$