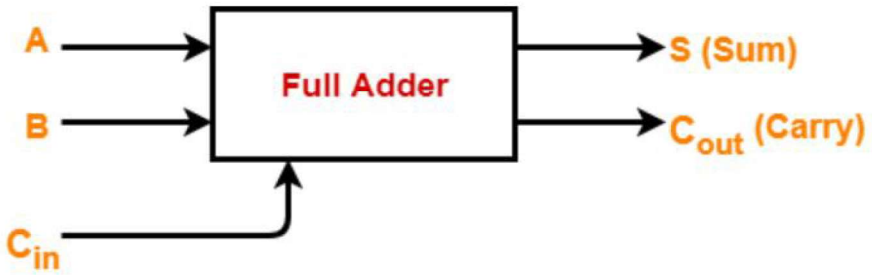
ADDERS

- Full Adder (FA)-
- It is used for the purpose of adding three single bit numbers.
- It contains 3 inputs and 2 outputs (sum and carry).



Step-01:

Identify the input and output variables-

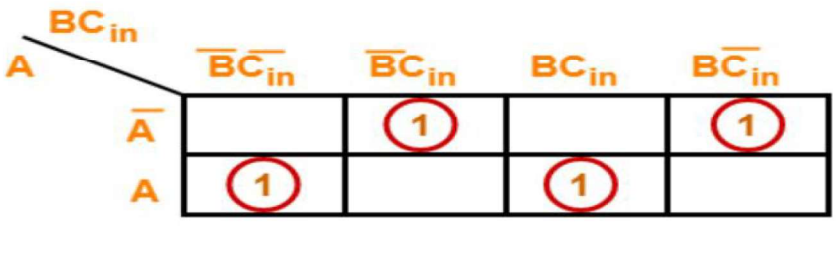
Input variables = A, B, Cin (either 0 or 1)

Output variables = S, Cout where S = Sum and Cout = Carry

Step-02:

Inputs			Outputs	
A	B	C_{in}	C_{out} (Carry)	S (Sum)
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

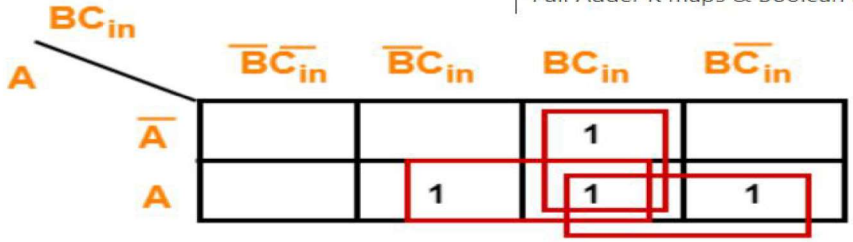
Step-03: K-maps



$$S = A \oplus B \oplus C_{in}$$

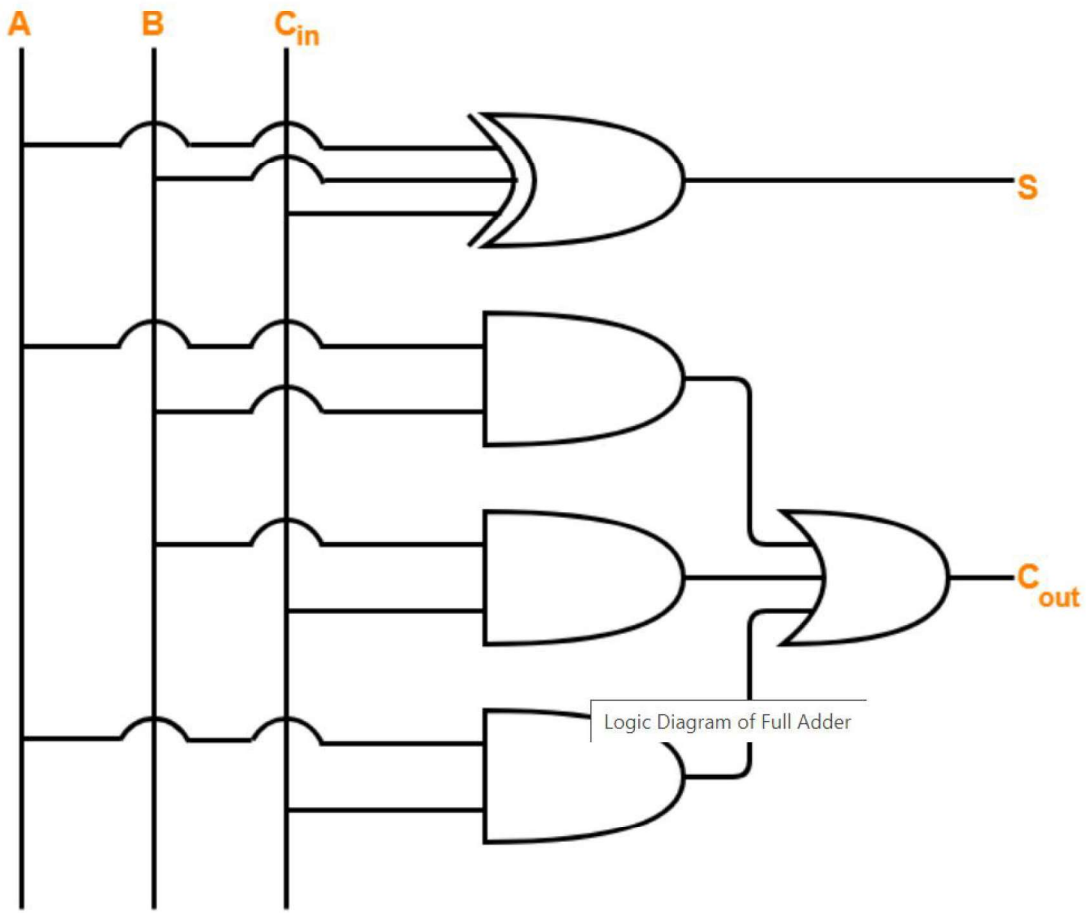
For C_{in}:

Full Adder K maps & Boolean Expression



$$C_{out} = AB + BC_{in} + C_{in}A$$

Step-04: Logic Diagram



Logic Diagram of Full Adder

FA using HA