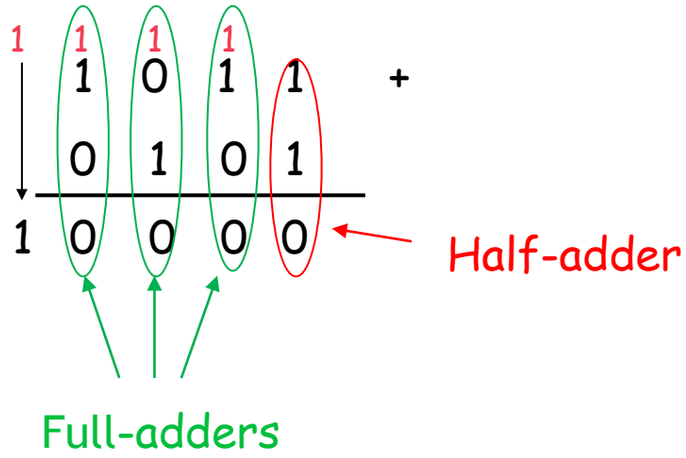
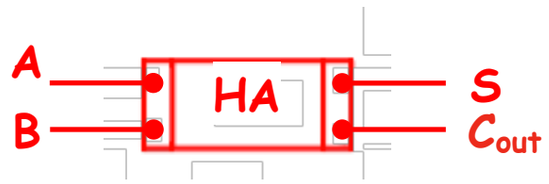
Half Full Adder

CLASS 15

Half-Adder and Full-Adder

Let's add two binary numbers to figure out all steps involved.



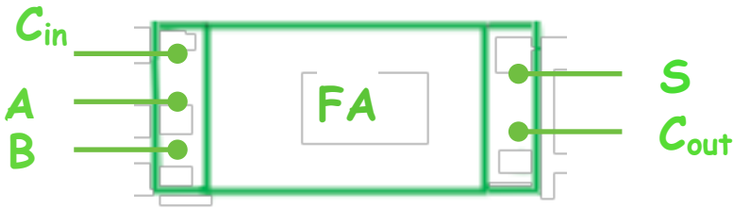


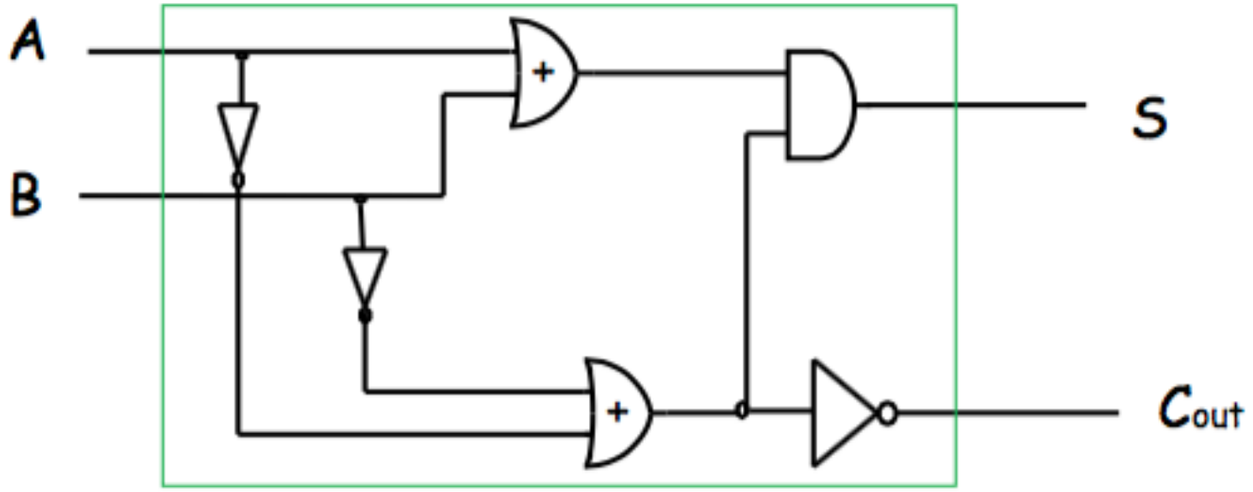
Half-adder:

A	B	S	Cout
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

$S = A'B + AB' = (A' + B')(A + B)$

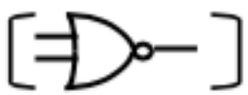
$C_{out} = A\ B = (A' + B')'$

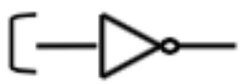




Half-adder with 3 gates

HW 17.3 - assigned

Express H A using only NOR [] gates

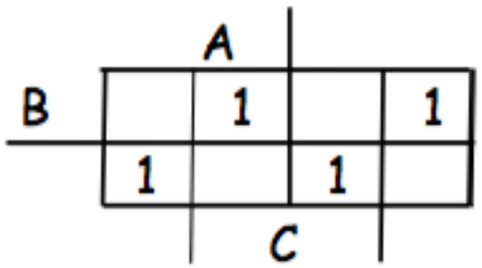
[] is allowed]

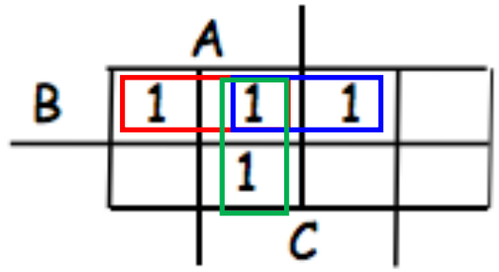
Full-adder

A	B	Cin	S	Cout
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

$S = A'B'C + A'BC' + AB'C' + ABC$

$Cout = A'BC + AB'C + ABC' + ABC$





$S = A'B'C + A'BC' + AB'C' + ABC$

$Cout = AB + AC + BC$

Majority function!

HW 17.4 - assigned: Construct a FA using only HA's and one other gate.