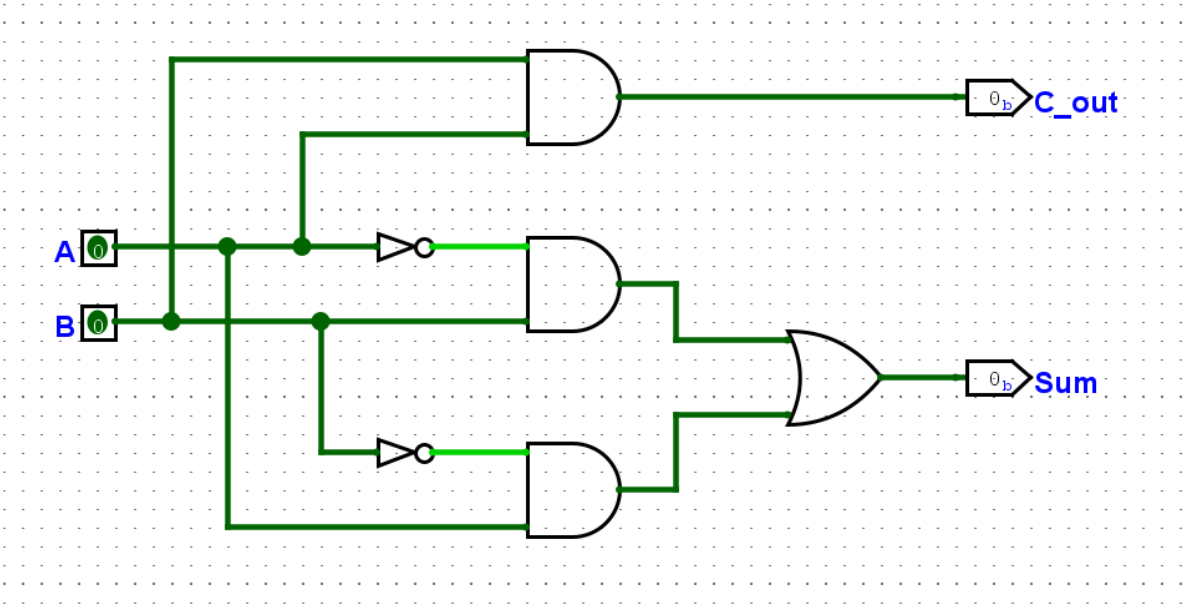
1. **Using this week's lectures as a guide, construct a half-adder and test it. Check its correctness by testing and filling out a truth table like the following. Add the circuit screen shot and the table to your submission document:**

A	B	Sum Output	Carry Output
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

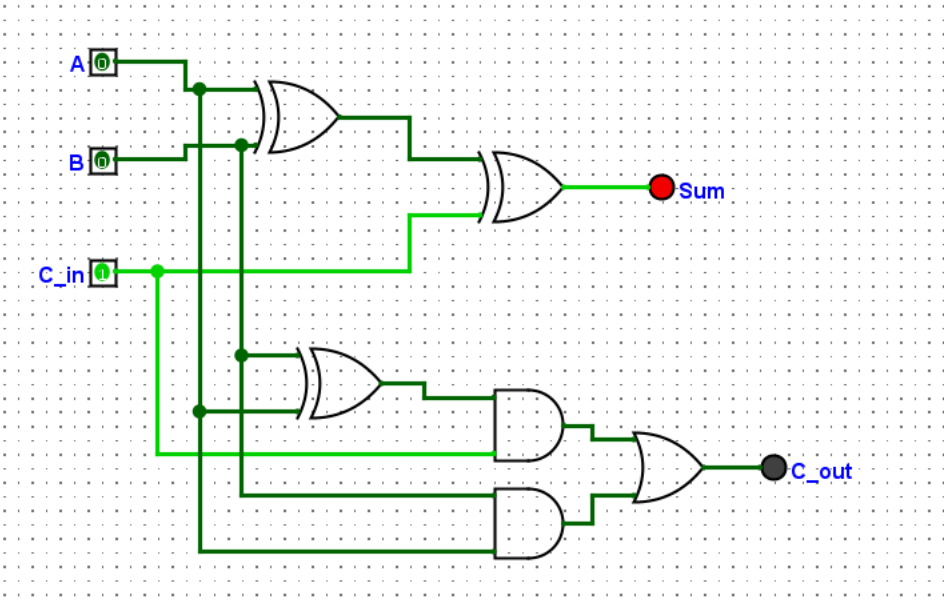


2. **Now extend your half-adder to a full-adder, which in addition to the two input pins, also handles a carry-in bit. Check its correctness by testing and filling out a truth table like the following. Add the circuit screen shot and the table to your submission document:**

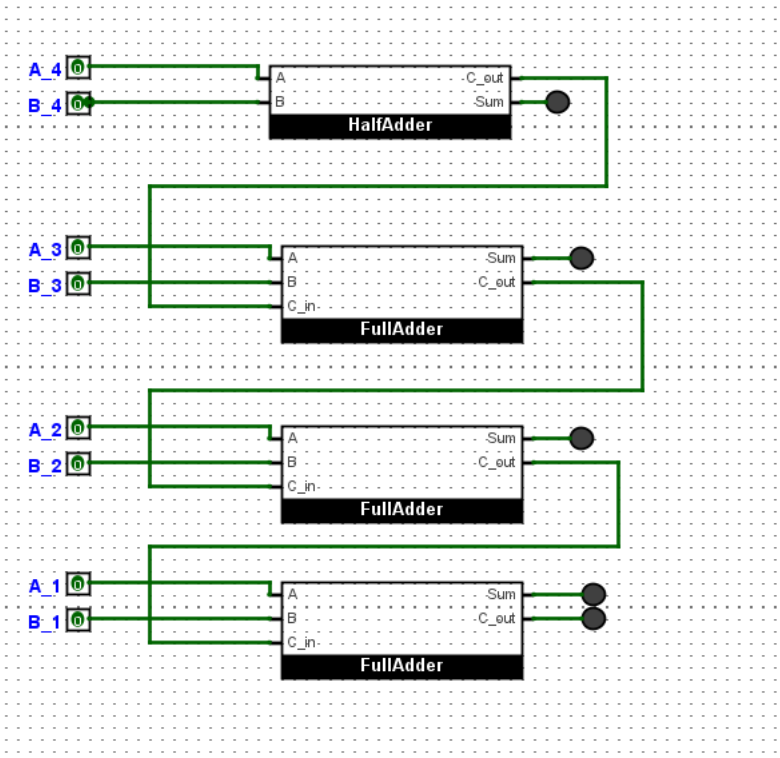
Input			Output	
A	B	C_in	Sum	C_out
0	0	0	0	0
0	1	0	1	0
1	0	0	1	0
1	1	0	0	1
0	1	1	0	1
1	0	1	0	1
0	0	1	1	0
1	1	1	1	1

Sum: A`BC' + AB'C' + A'B'C + ABC = C'(A`B + AB') + C(A'B' + AB) =C` (A XOR B) + C(A XNOR B)
= C` (A XOR B) + C(A XOR B)` =C XOR (A XOR B)

C_out: ABC' + A'BC + AB'C + ABC = C(A'B + AB' + AB) + ABC' = C [(A XOR B) + ABC] + ABC'= (A XOR B)C + ABC + ABC' = (A XOR B)C + AB (C + C') = (A XOR B)C + AB



3. **Once complete, check its correctness by testing and filling out a truth table like the following (over page). Add the circuit screen shot and the table to your submission document:**



Input A	Input B	Ouput
0101	0000	00101
0101	0001	00110
0101	0010	00111
0101	0011	01000
0101	0100	01001
0101	0101	01010
0101	0110	01011
0101	0111	01100
0101	1000	01101
0101	1001	01110
0101	1010	01111
0101	1011	10000
0101	1100	10001
0101	1101	10010
0101	1110	10011
0101	1111	10100