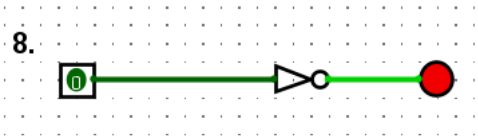
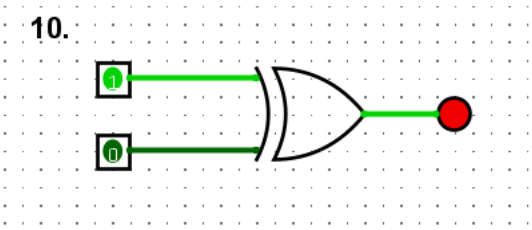
8. Connect up an inverter (NOT gate), a pin and an LED to the output. Check its correctness by filling out a truth table like the following. Add the circuit screen shot and the table to your submission document:

Pin	Output
0	1
1	0



10. Connect up a 2-input XOR gate, connect a pin to each input and an LED to the output. Check its correctness by filling out a truth table like the following. Add the circuit screen shot and the table to your submission document:

Pin 1	Pin 2	Output
0	0	0
0	1	1
1	0	1
1	1	0

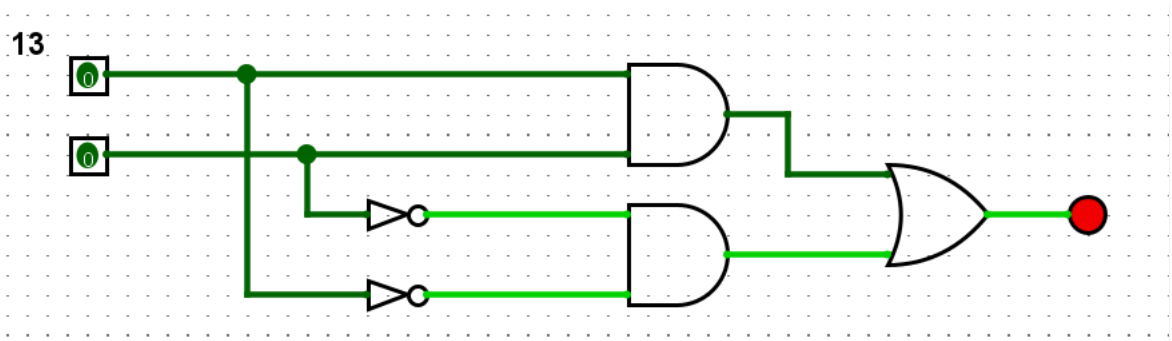


12. Using Boolean Algebra, derive a logical expression that compares two two binary inputs A and B. That is, it should evaluate to True if and only if both A and B are the same (i.e, output = 1 if inputs are both 0, or both 1).

Pin A	Pin B	Output
1	1	1
0	0	1
1	0	0
0	1	0

$$\boxed{AB + A'B'}$$

13. Now implement your circuit from Step 12 in Logisim, and test it to ensure it works as described above.



15. Extend your circuit from Step 13 to do the same thing for three inputs. It should output 1 if all three input bits are either all 0, or all 1.

Pin A	Pin B	Pin C	Output
1	1	1	1
0	0	0	1
1	0	0	0
0	1	0	0
0	0	1	0
1	1	0	0
1	0	1	0
0	1	1	0

$$ABC + A'B'C' = ABC + A'B'C'$$