

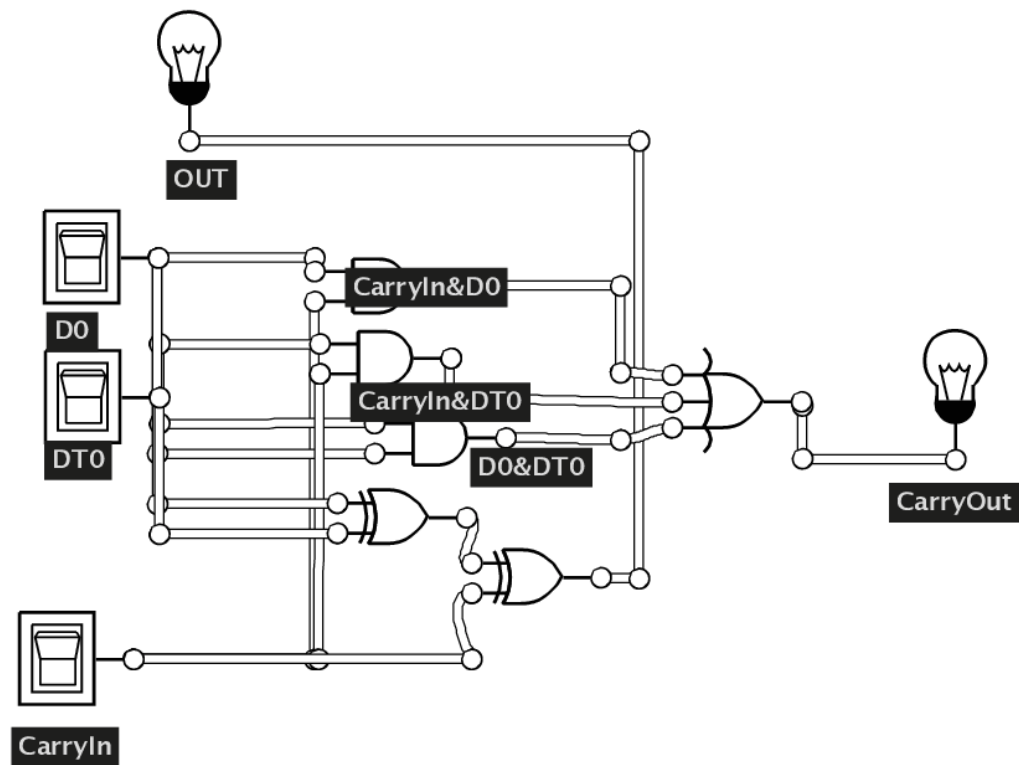
Creating a 4-bit adder

Creating a Full-Adder

Carry In(C)	D0	D1	Cout	Sum	C&D0 (1)	C&D1 (2)	D0&D1(3)	1 2 3	CxorD0xorD1
0	0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	0	1
0	1	0	0	1	0	0	0	0	1
0	1	1	1	0	0	0	1	1	0
1	0	0	0	1	0	0	0	0	1
1	0	1	1	0	0	1	0	1	0
1	1	0	1	0	1	0	0	1	0
1	1	1	1	1	1	1	1	1	1

Before you can make a 4-bit adder, you need a full adder. A full adder takes in 3 inputs, two numbers and a carryin, and puts out 2 outputs, a sum and a carryout. I created a truth table for the full-adder, and then tried to find combinations of the inputs to create outputs that match. I then used this information to create a full-adder circuit.

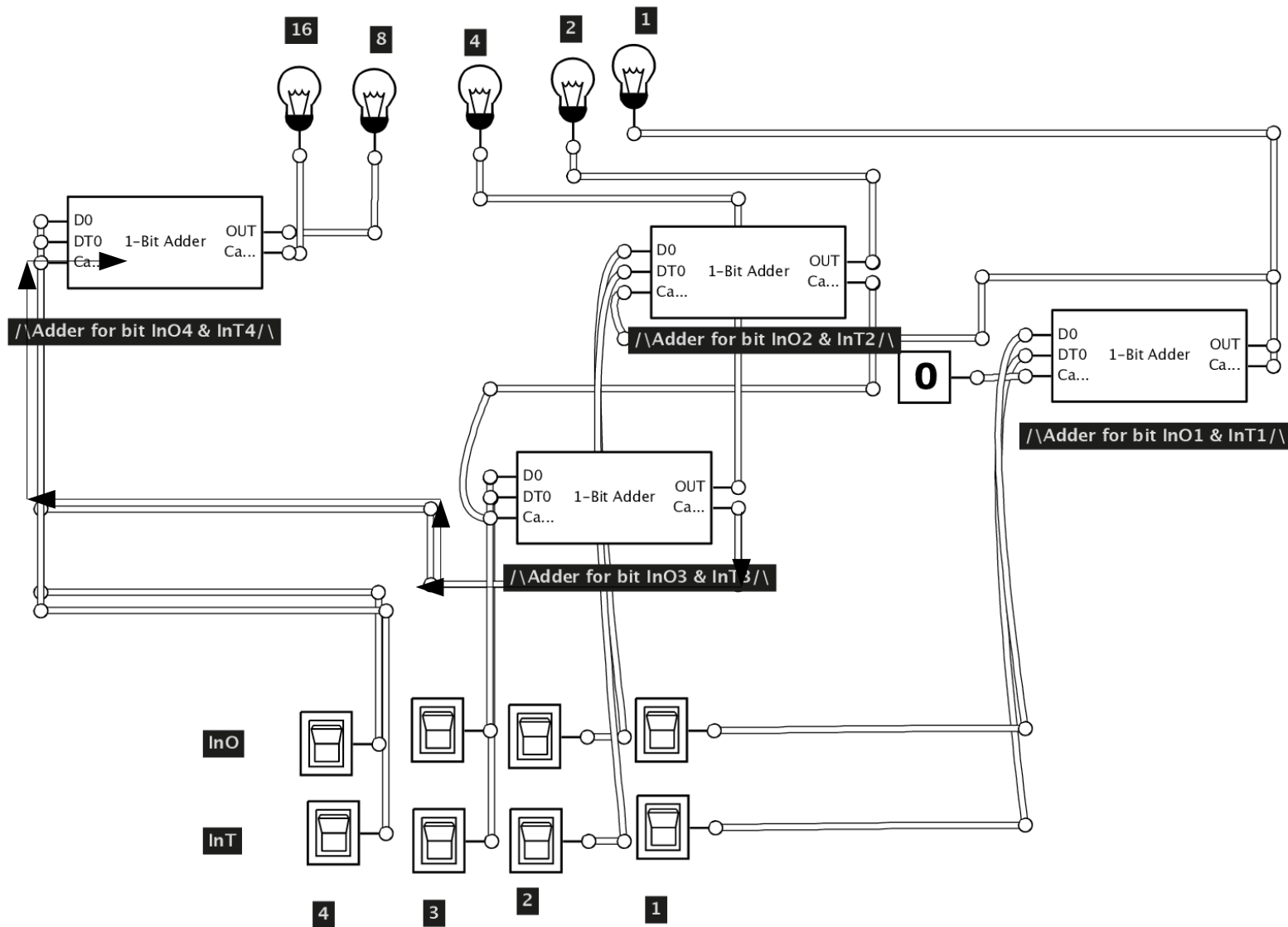
Structure of a full-adder



1-Bit Adder

Using a full-adder to make a 4-bit adder

- First, I created an integrated circuit for the full-adder.
- Then I created a carry chain with them, so that the carryout of one goes into the carryin of the next.
- Then I wired it up to some lights and switches, and I had a 4-bit adder!



Structure of a 4-bit adder