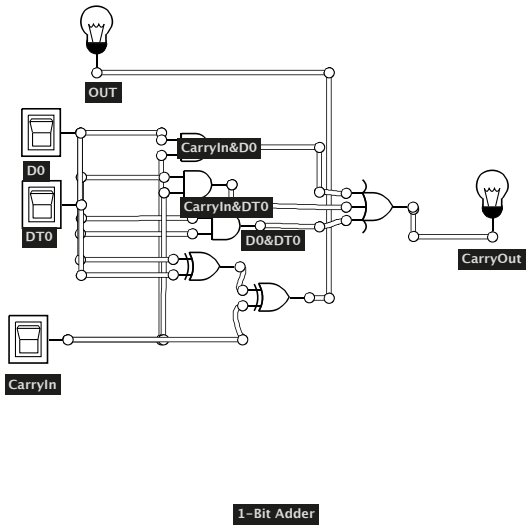
Computing Homework 24/09/13

My homework from the 24th of September 2013 was to build a circuit in Logicly that could add two 4-bit numbers together, output 5 signals in the form of lights, and that is what I did.

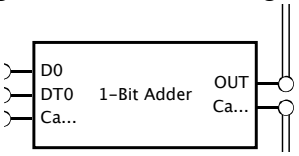
For the adder, I decided to use 4 1-bit adders and link them together with a carry output, and a carry input. I used Logicly's integrated circuit function for spacing purposes. The truth table for the 1-bit adder is this:

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

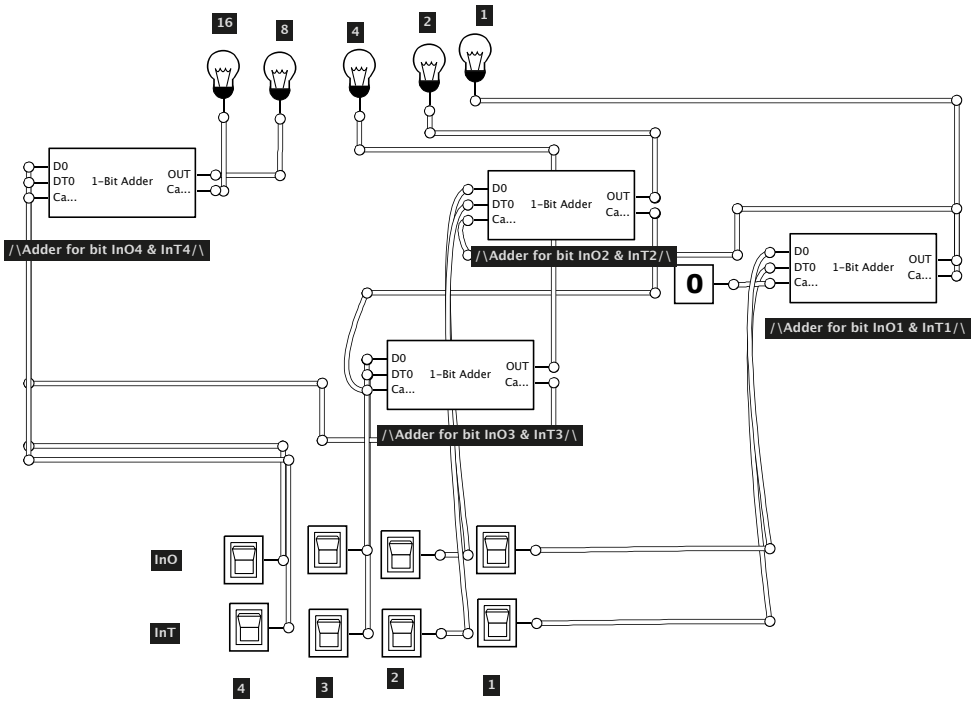
In this case, **(1)|(2)|(3)** and **Cout** are equal, and **CxorD0xorD1** and **Sum** are also equal. I used this information to create the 1-bit adder circuit shown here:



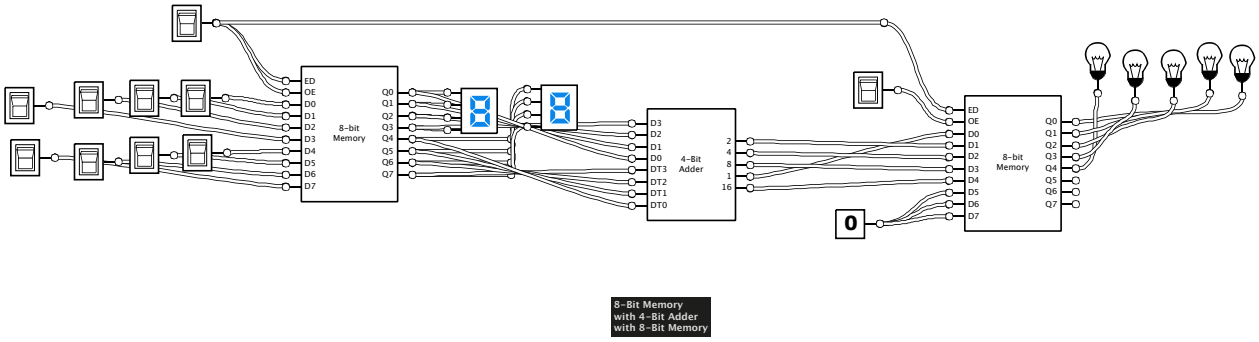
I then created an Integrated Circuit in Logicly that looked like this:



And then used it to create this:



I then copied this circuit into my main Logicly file and integrated it with my 8-bit memory. It looked a bit like this:



As you can see, it takes in 2 4-bit numbers, stores them, and then outputs them to the 4-bit adder, and then the answer is stored inside some more 8-bit memory, and is then output. Attached is the Logicly file with the four-bit adder, and the .pdf file of the 4-bit adder used in the creation of this document.