ELC 2137 Lab 3: Adders

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Summary

In this lab we experimented with carries and sums that are produced in binary adders. We created 3 circuits, all of which came together to make our final 2-bit adder. To prove the circuits and binary calculations the circuit was making were true, the class made sperate schematics, wiring diagrams, and truth tables. After this lab, I felt more confident in my ability to read and write a circuit schematic, as well as how to use transistors to make calculations of And and XOR gates.

Q&A

1. Which gates could we use for combining the carry bits?

   We could use AND and XOR gates as we had seen in class.

2. Which of the above should we use and why?

   We would want to use the AND gates. The AND gates can be negated in a way that mimics the use of XOR without adding another transistor chip.

Results

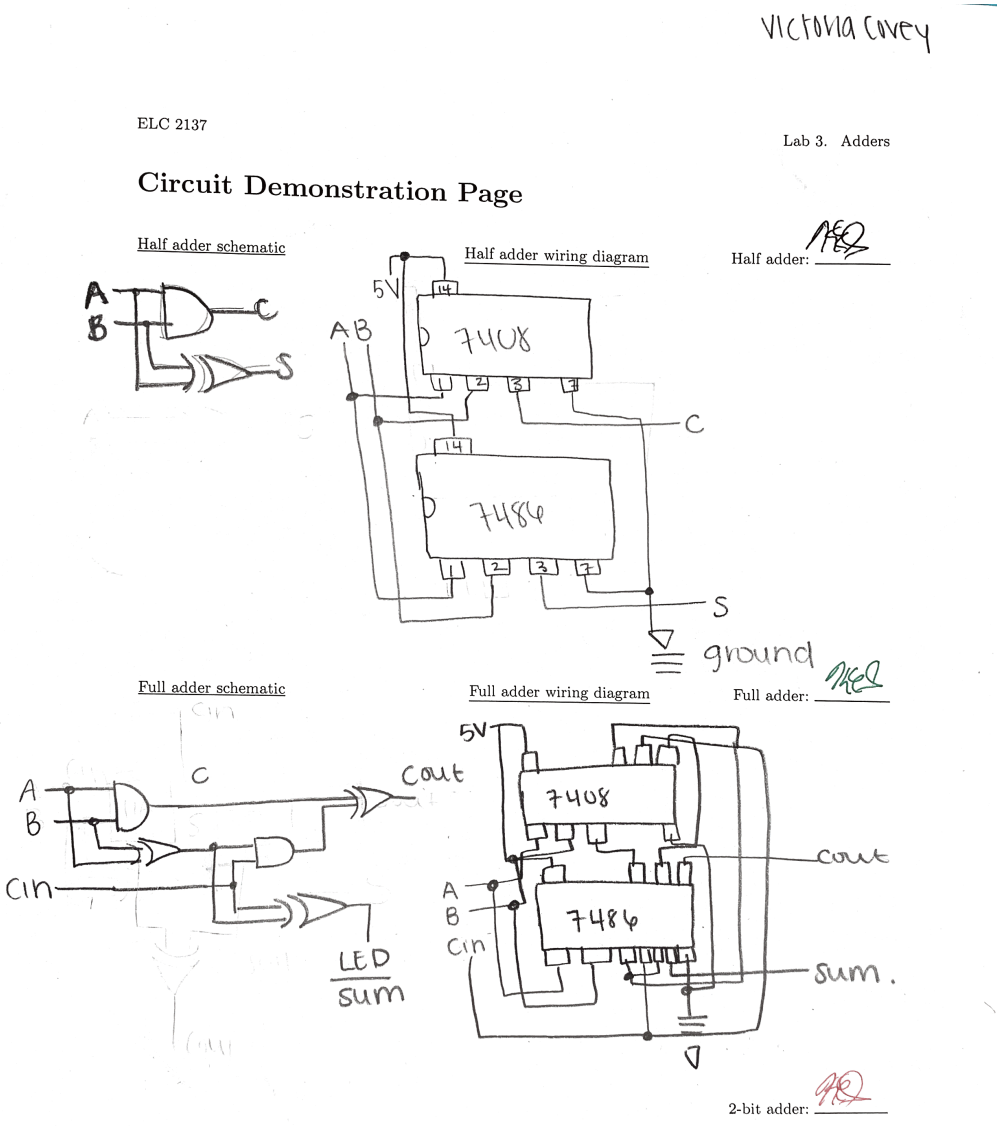

fig: Signed Off Circuit Demonstration Page

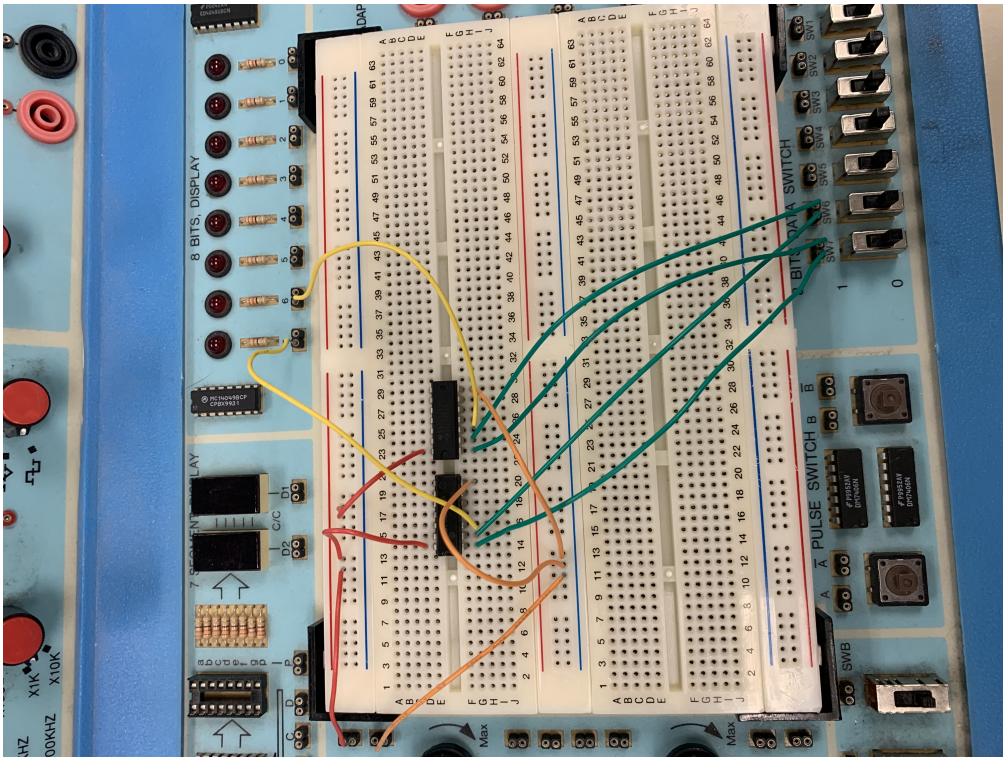

fig: Half Adder Circuit

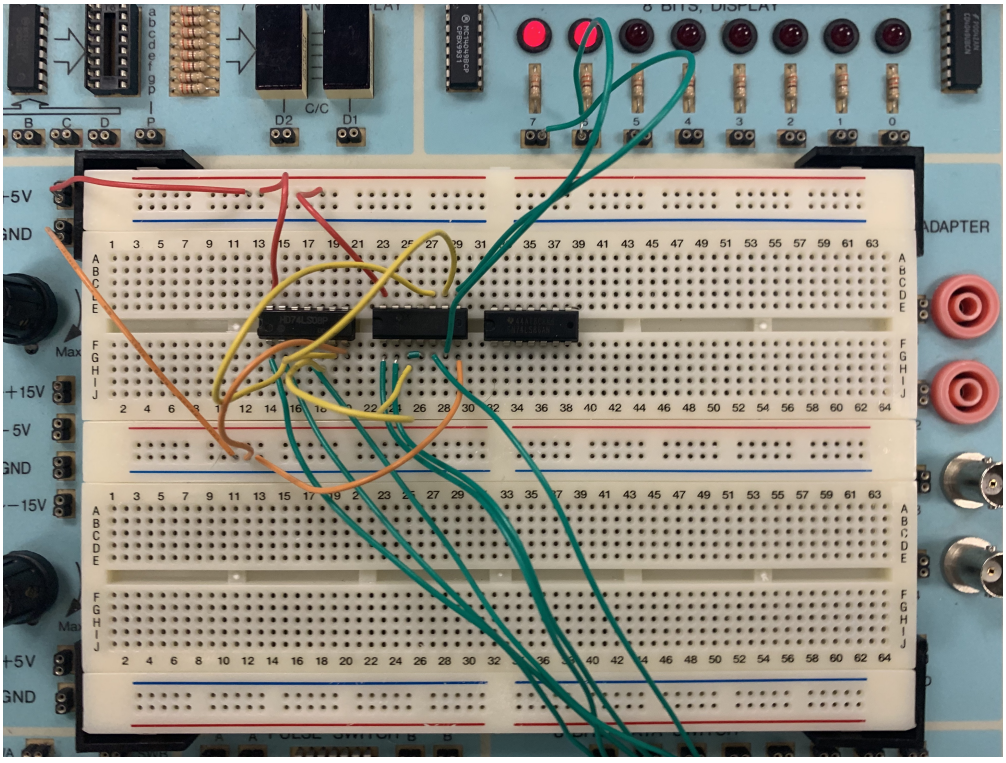

fig: Full Adder Circuit

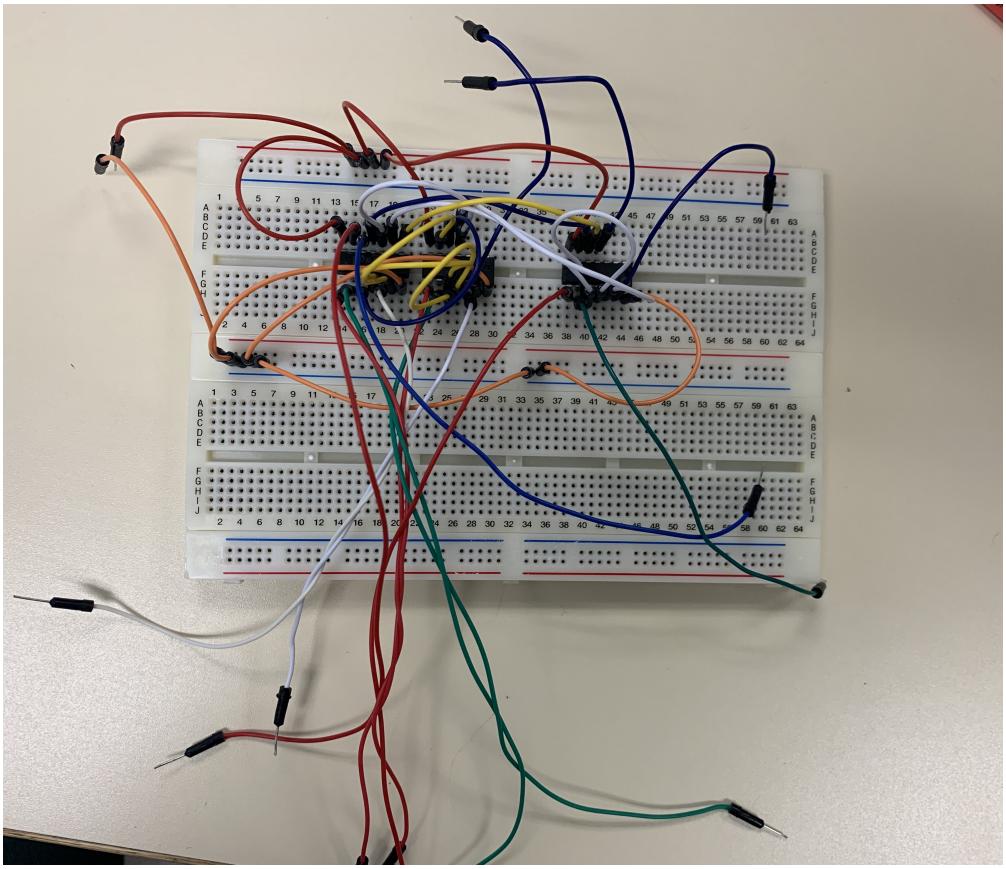

fig: 2 Bit Adder Circuit

Cin	A	B	c1	s1	c2	s2	cout	S
0	0	0	0	0	0	0	0	0
0	0	1	0	1	0	1	0	1
0	1	0	0	1	0	1	0	1
0	1	1	1	0	0	0	1	0
1	0	0	0	0	0	1	0	1
1	0	1	0	1	1	0	1	0
1	1	0	0	1	1	0	1	0
1	1	1	1	0	0	1	1	1

fig: Full Adder Truth Table Showing Half Adders