

ELC 2137 Lab #3: Adders

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Summary

Type the summary of your experiment and results here.

Q&A

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

Based on the truth table, a OR gate needs to be used for the carry bits. Only one carry needs to be true, the out carry will be true. It is an OR gate. The first and second carry are not true at same time, so an XOR gate is also fine.

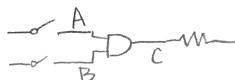
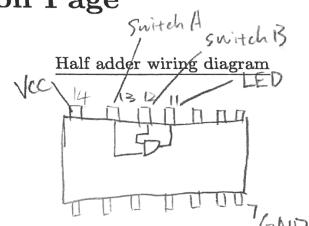
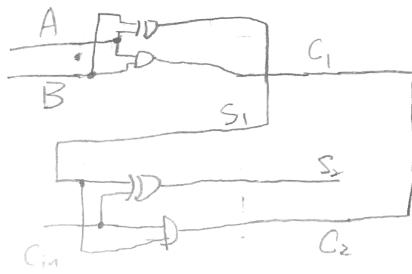
2. Which one should we use and why?

A OR gate should be used in the lab, but XOR gate is also fine. In the lab, 7486 chip is used. The chip has four XOR gates. The carry1 and carry 2 are not true at the same time. It is true when one of the carry is true, so using a XOR will be identical as using OR gate.

Results

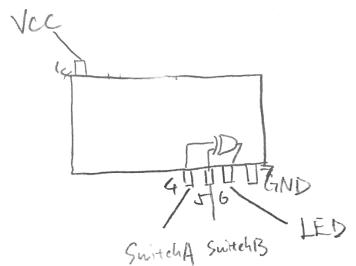
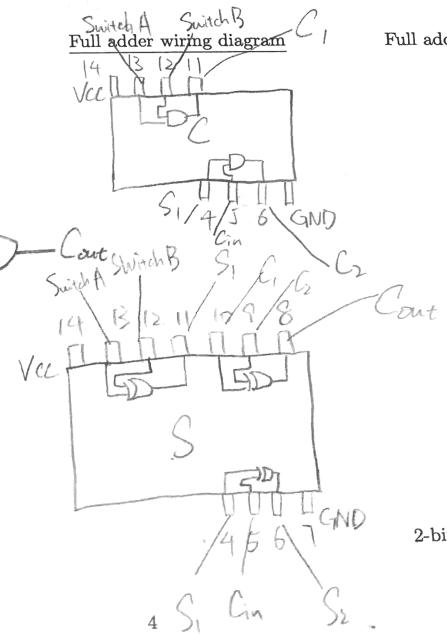
In this section, put your simulation waveforms, results tables, pictures of hardware, and any other required items. According to the the table above,

Table 1: 2-bit adder truth table									
Cin	A	B	C1	C2	S1	S2	Cout	S	
0	0	0	0	0	0	0	0	0	
0	0	1	0	0	1	1	0	1	
0	1	0	0	0	1	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	

Circuit Demonstration PageHalf adder schematicFull adder schematic

Half adder: BD

A	B	C	S
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

Full adder wiring diagramFull adder: BD2-bit adder: BD**Circuits**

There is a lack of the full adder pictures, but the left half of the 2-bit adder is full adder circuit.

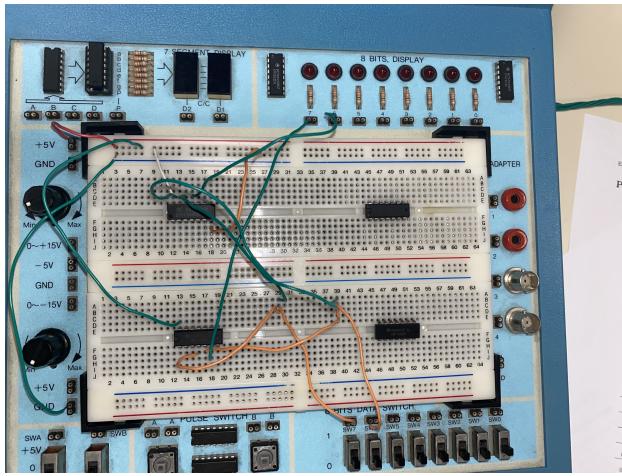


Figure 1: This is the half adder.

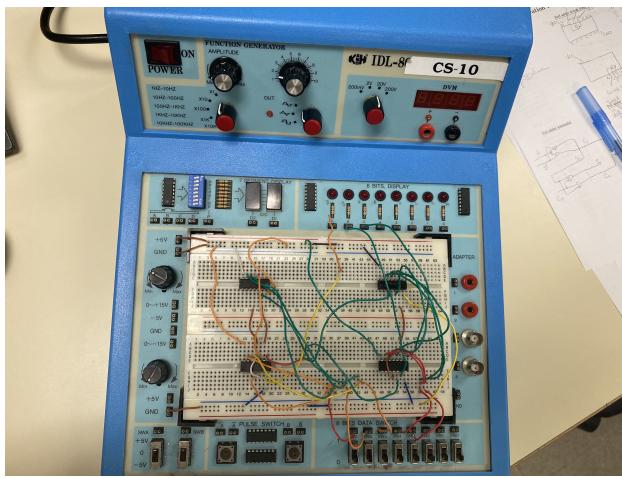


Figure 2: This is the 2-bit adder.

Conclusion