8-BIT Arithmetic Logic Unit (ALU)

by

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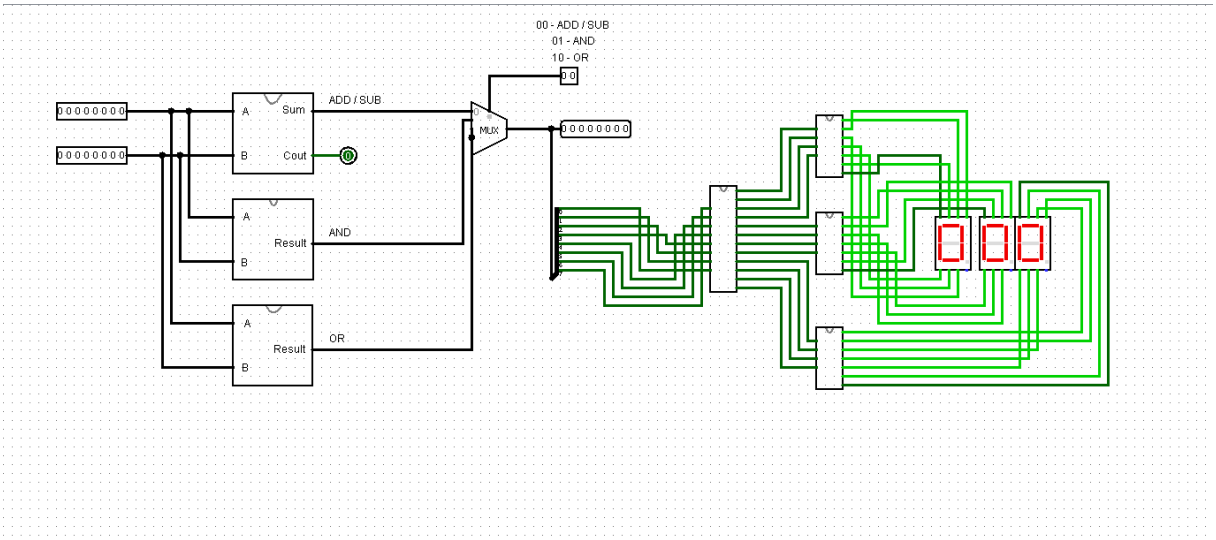
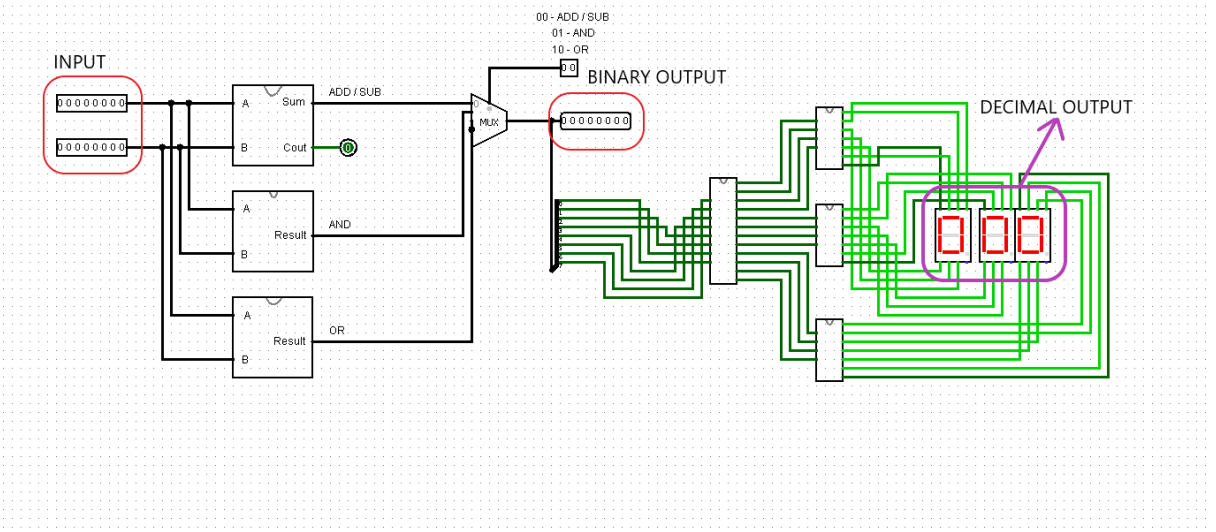
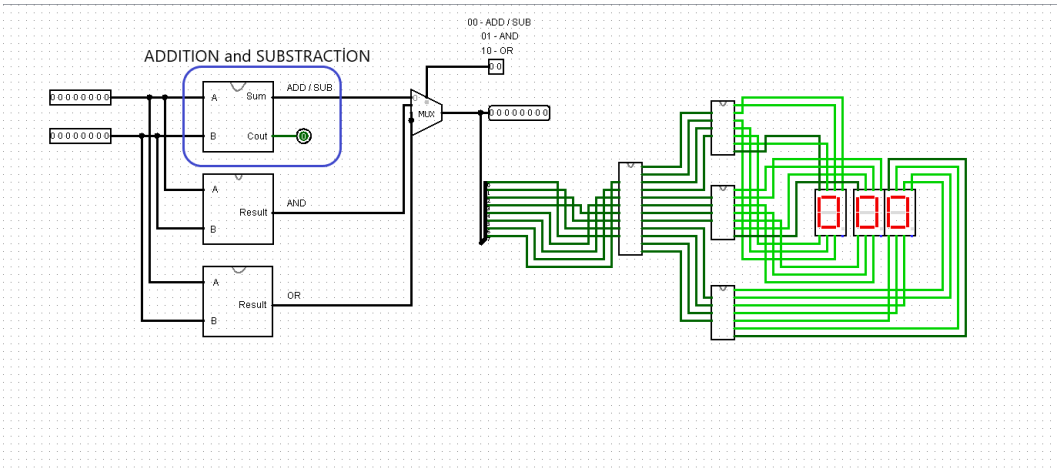
This is the 8-bit ALU designed by us on Logisim. It has “Addition” and “Subtraction” in addition to that also has “AND” and “OR” operators. It can also display the output in both binary and 7-Segment Display up to 3 digits.



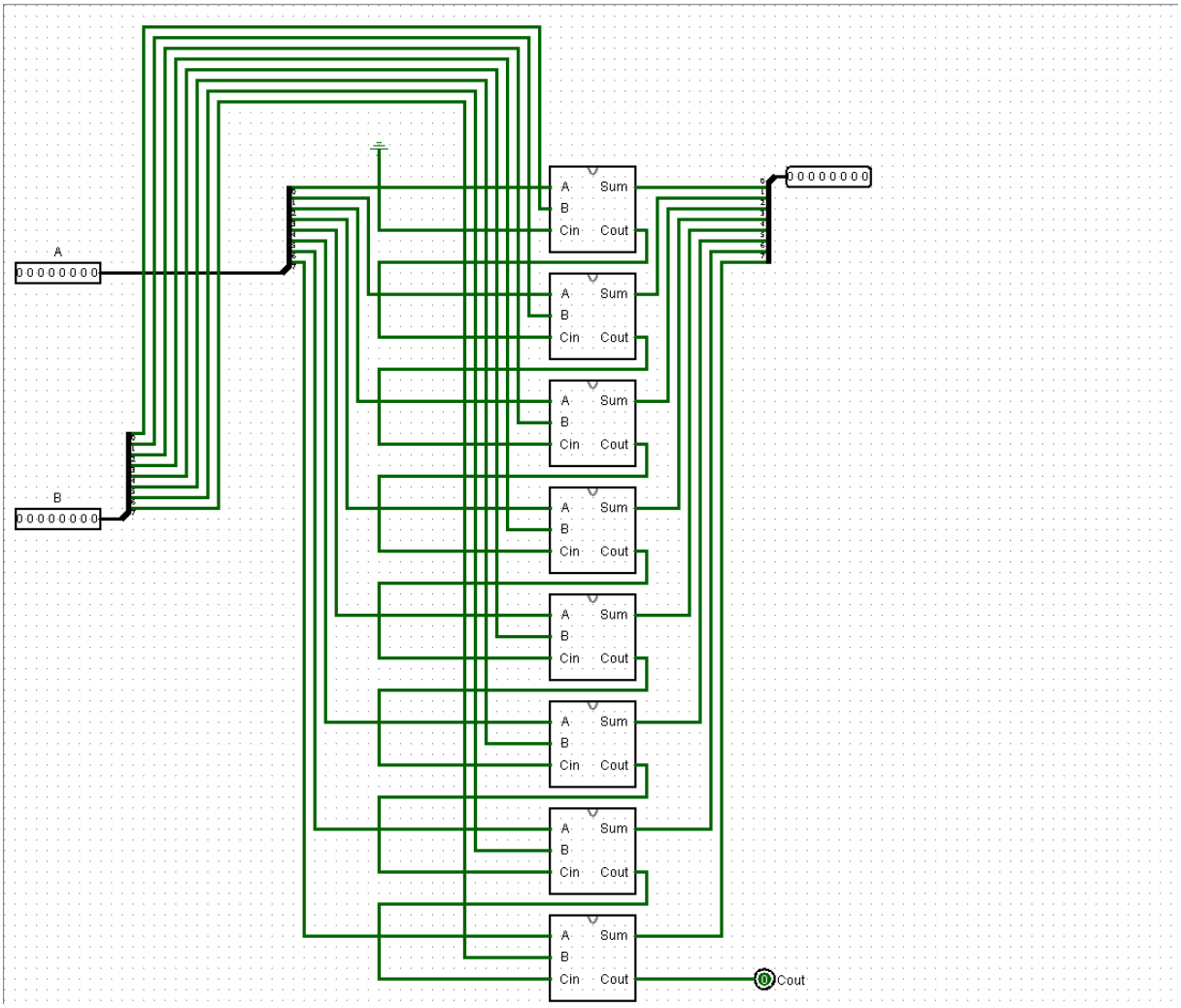
Inputs and Outputs are located here. These are takes 8-bit input.



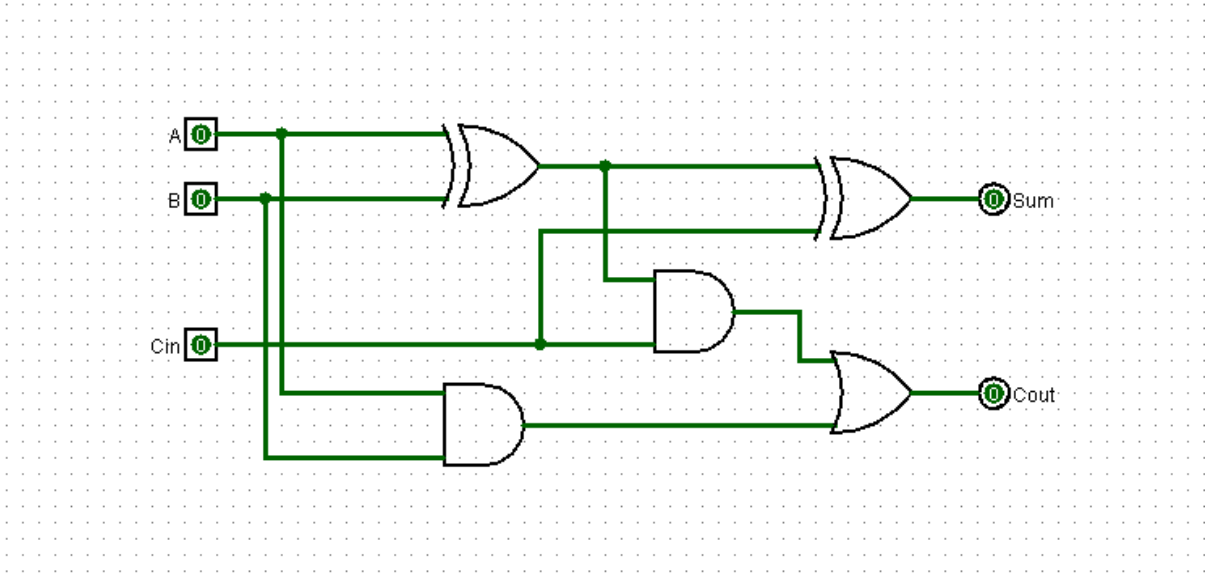
These are “Addition” and “Subtraction”.



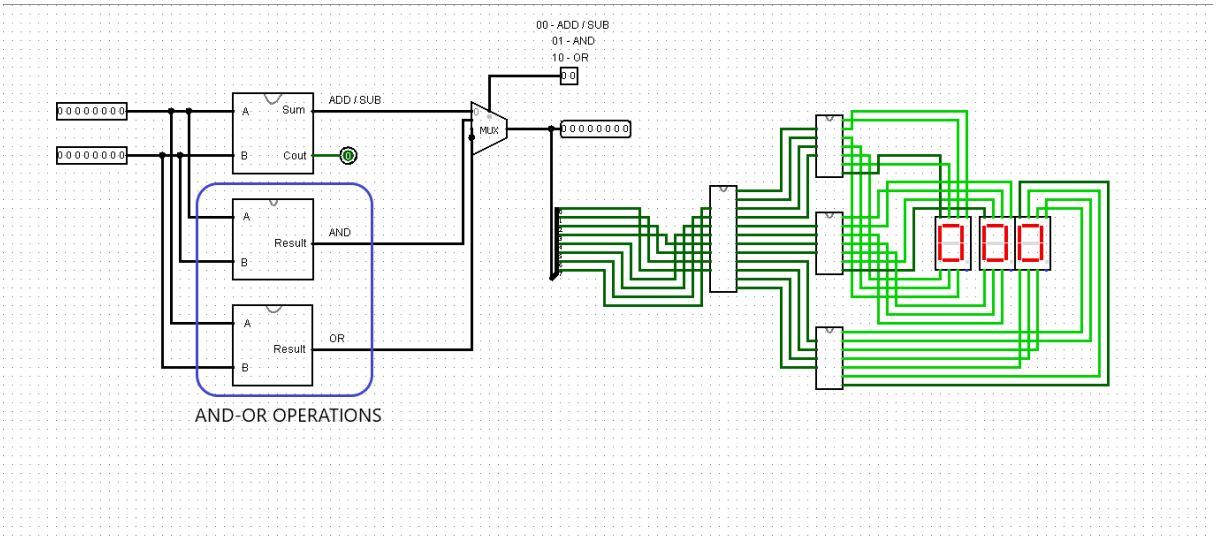
It’s inside like this.



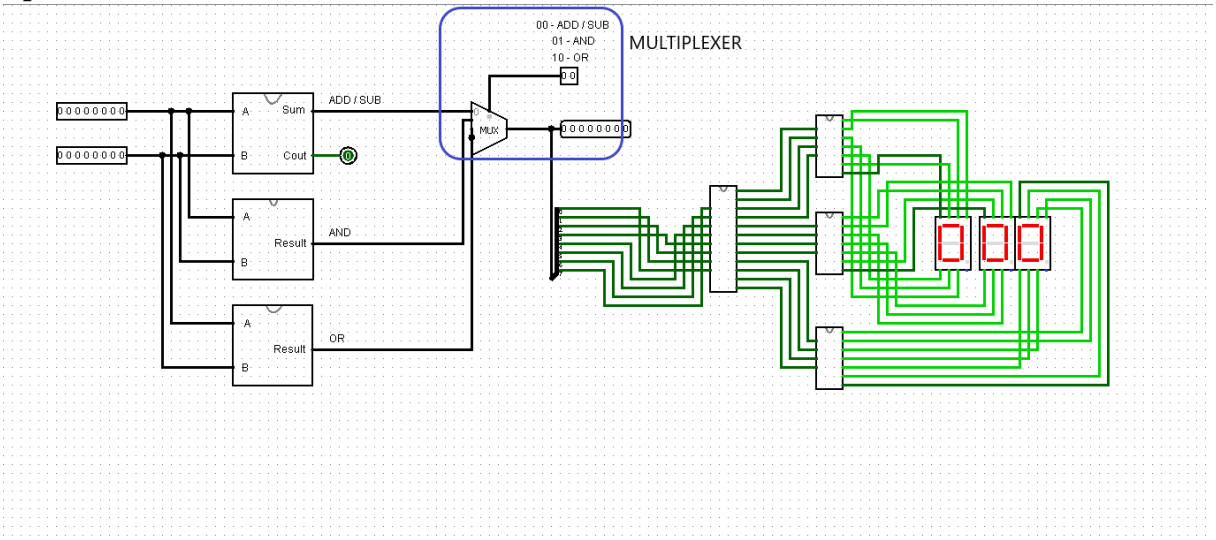
Includes full adders like this.



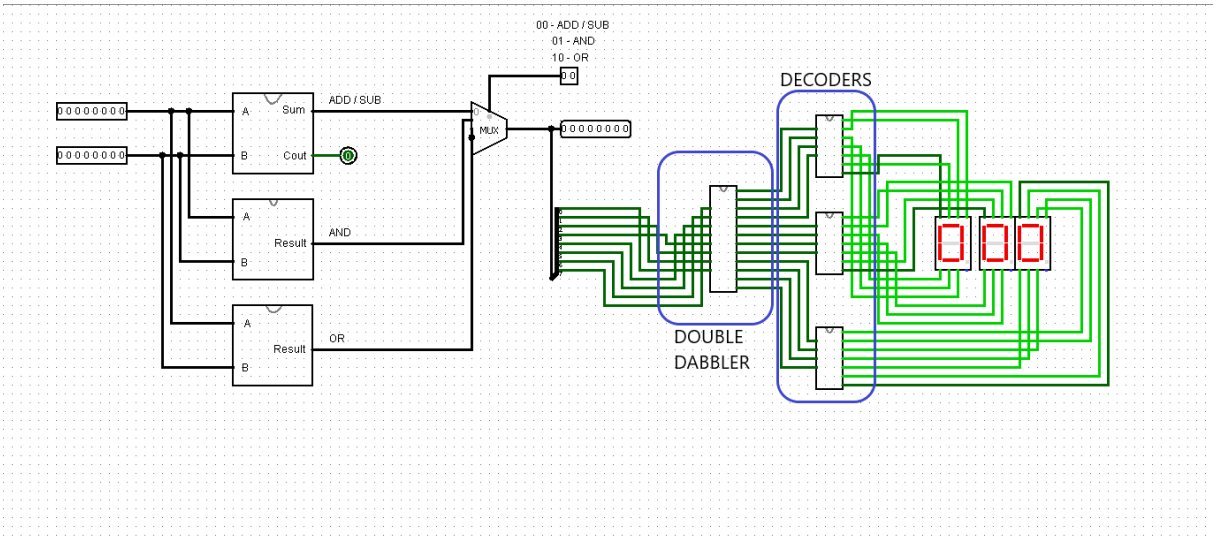
The “AND” and “OR” operations happening here.



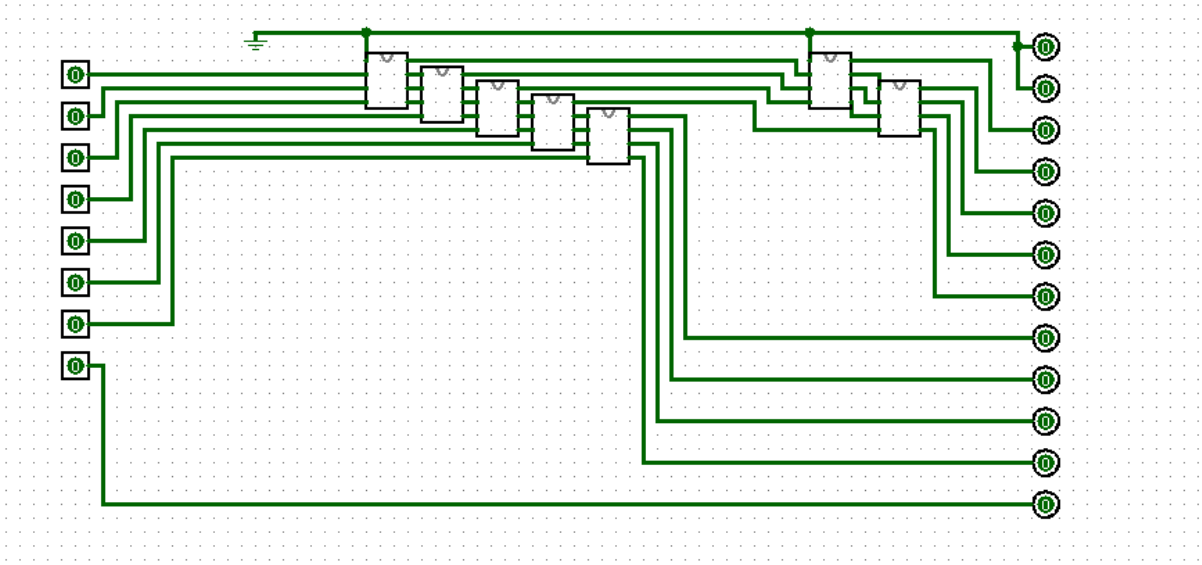
There is a Multiplexer here and it gives us the opportunity to choose between operations.



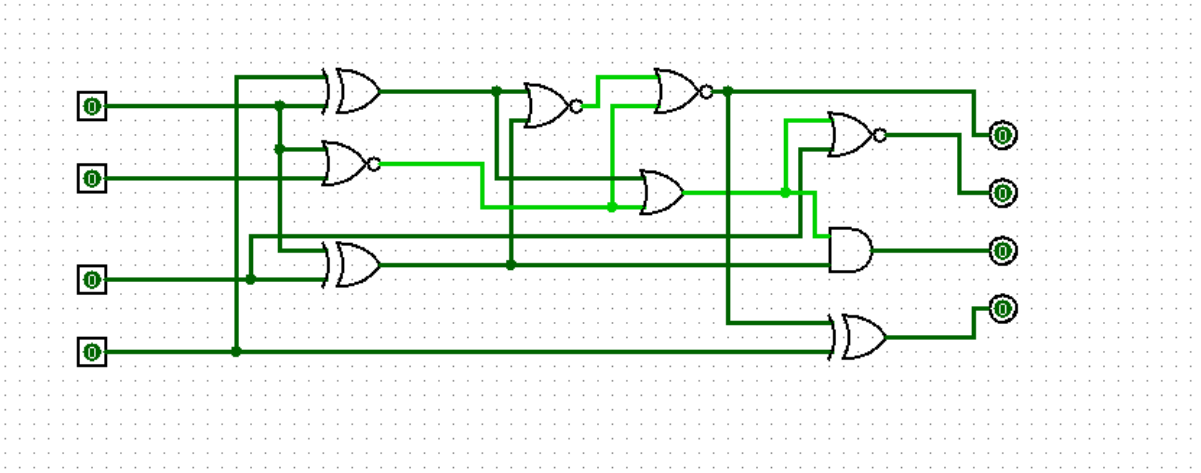
The Outputs are a bit tricky especially 7-Segment Display because it uses Decoders and Dabbler Algorithm that we implemented here.



Double Dabbler includes 7 Dabbler.

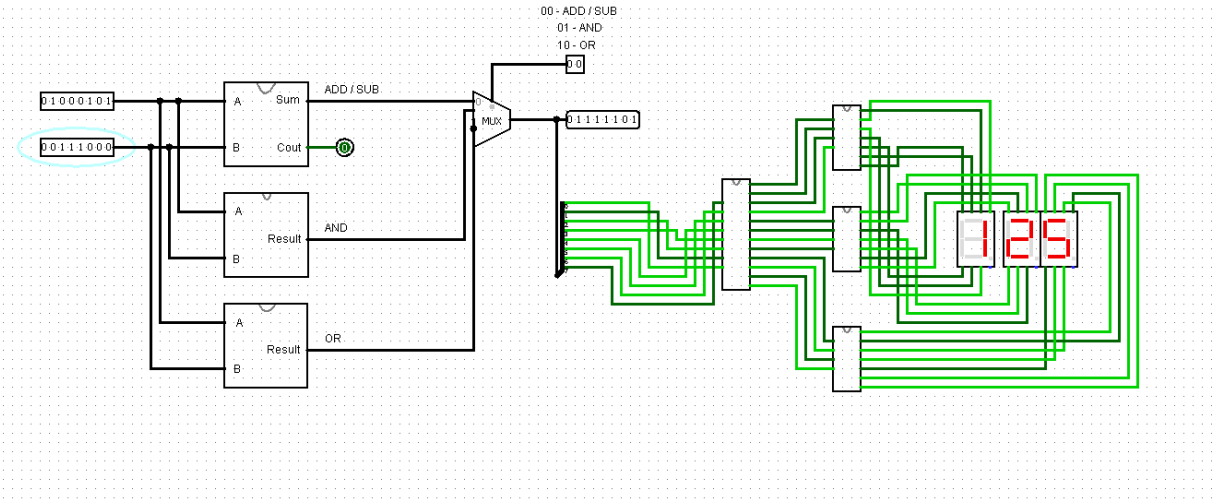


And a Dabbler only includes these logic gates.

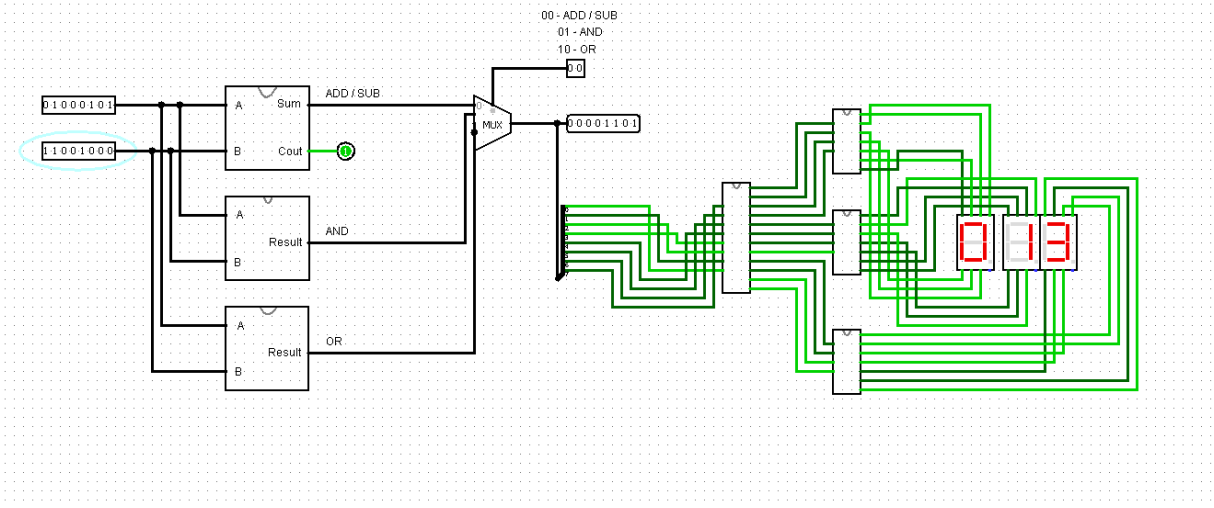


Let’s show some examples.

This is an addition operation. Which adds 69 to 56.



This is the subtraction which is 69 - 56. As you can see to do the subtraction with binary inputs, we need to take 2’complements of the second number.



These are “AND” and “OR” operations.