

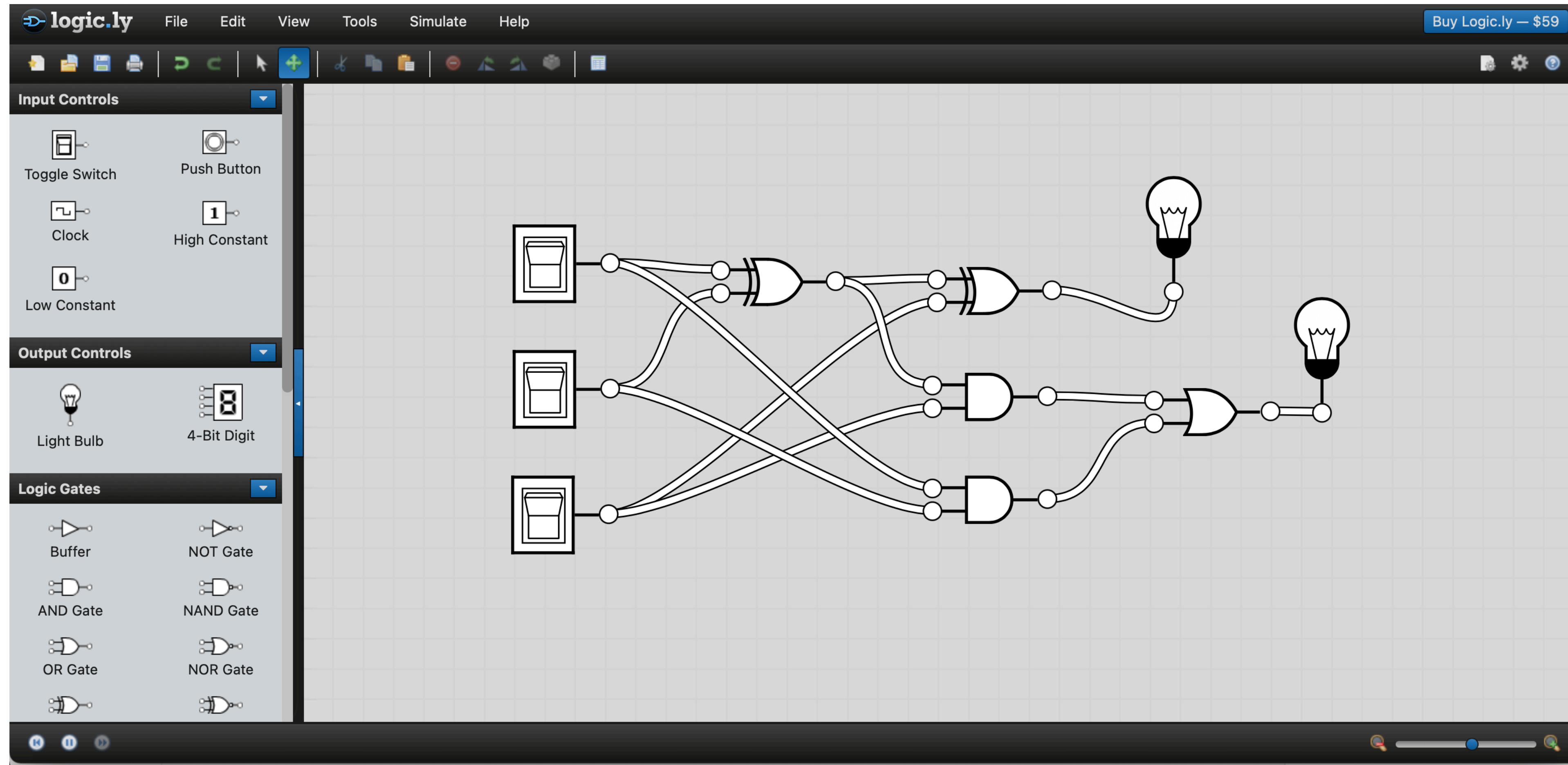
How to Build a 4-bit adder in logic.ly

Steps by Chris Gregg

<https://logic.ly/demo/>

Step 1:

Build a full adder

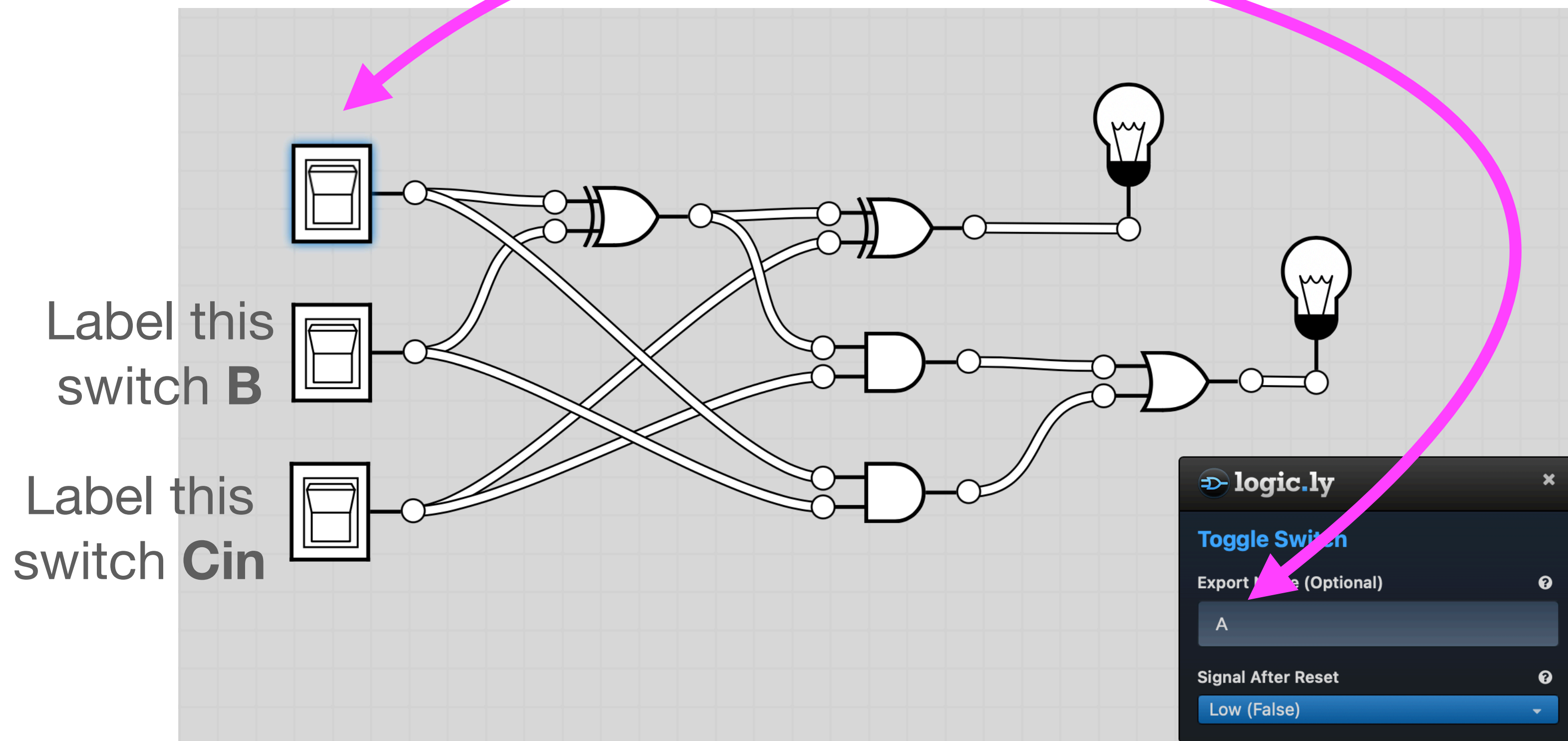


Step 2:

Label inputs (switches)

A. Click on each switch, and label the inputs **A**, **B**, and **Cin** ("Carry In")

The top switch should be labeled **A**

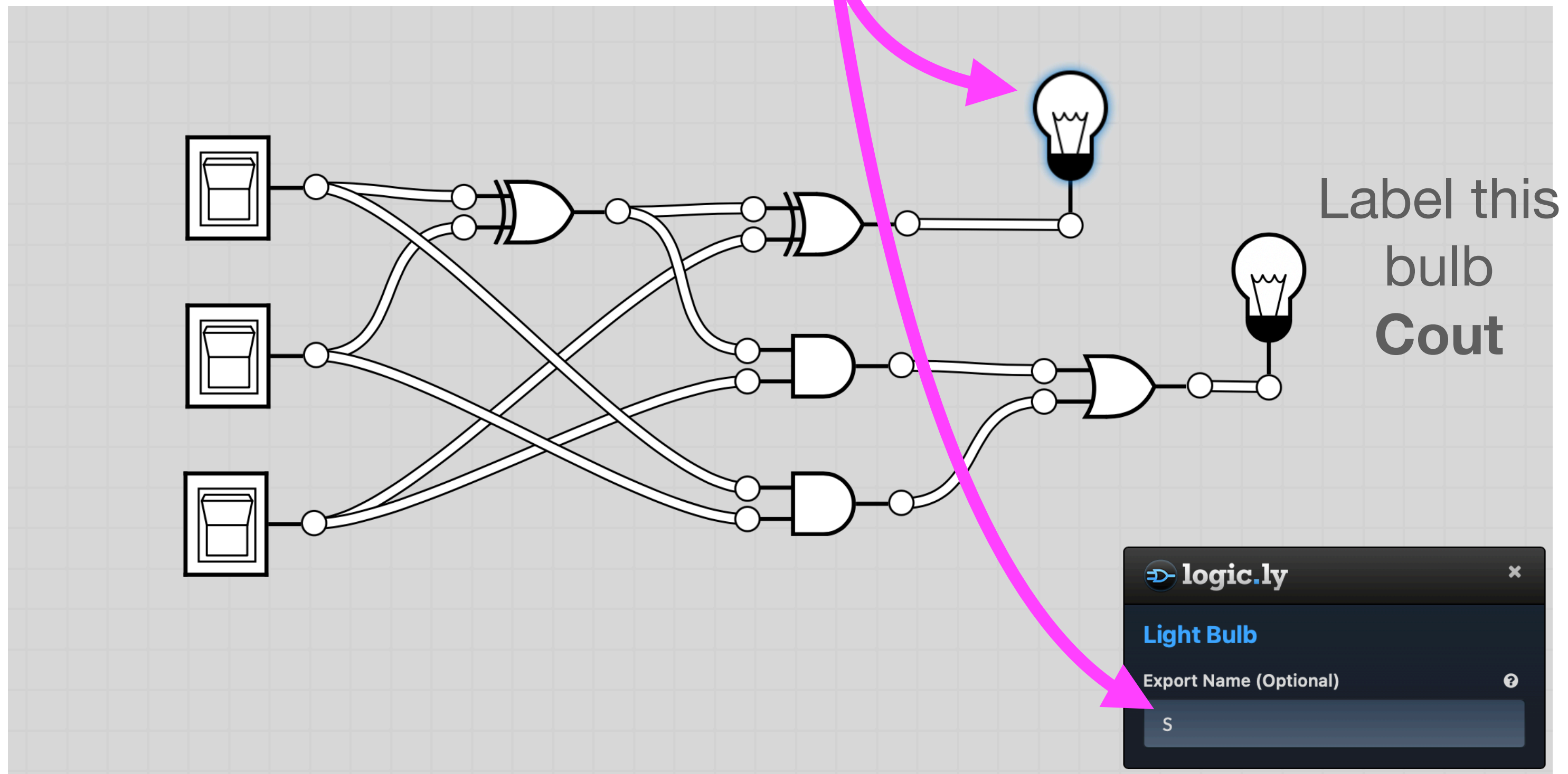


Step 3:

Label outputs (bulbs)

A. Click on each bulb, and label the outputs **S** (for "Sum"), and **Cout** ("Carry out")

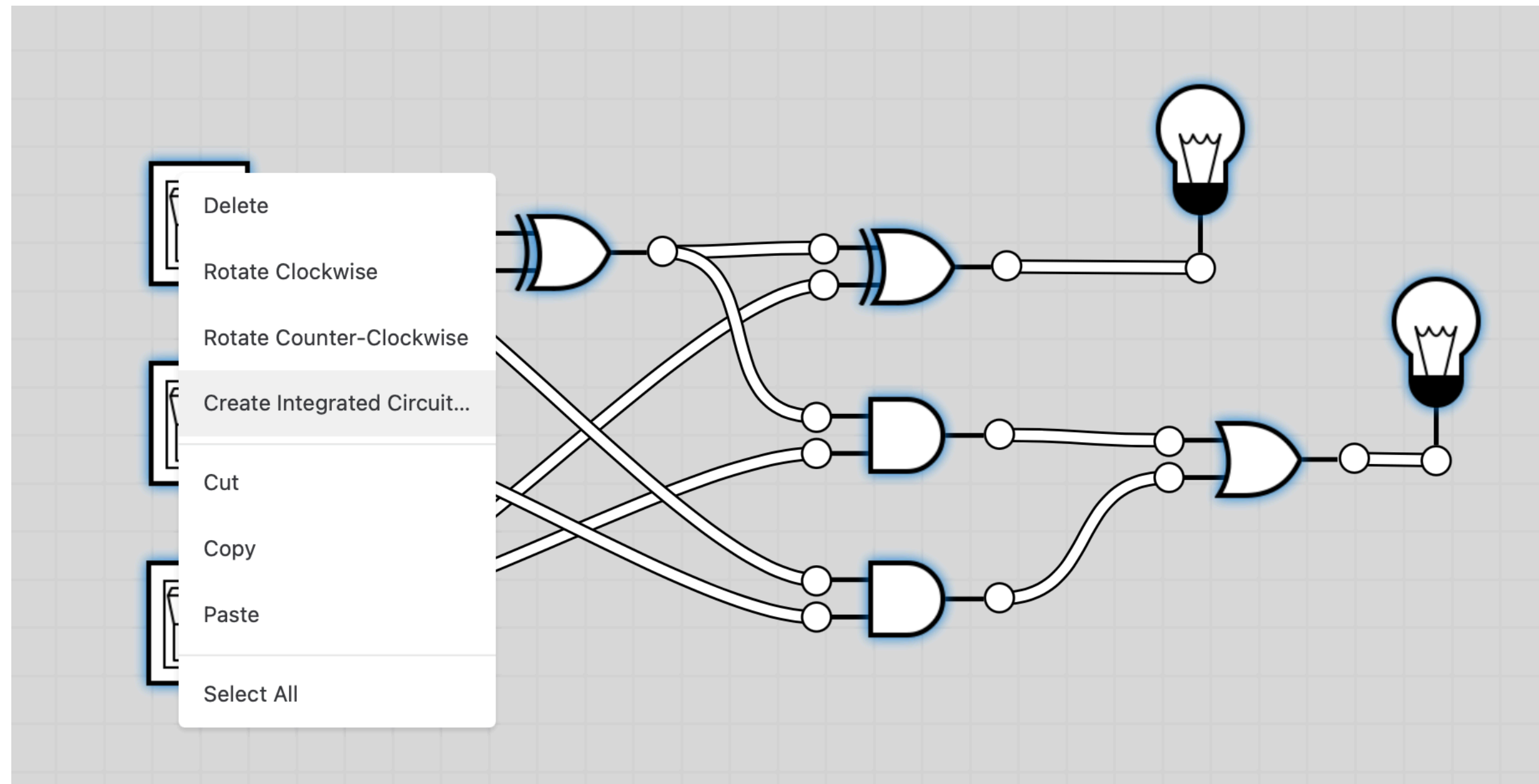
The top bulb should be labeled **S**



Step 4:

Select all elements, right/ctrl-click and select "Create Integrated Circuit..."

A. Click on each bulb, and label the outputs **S** (for "Sum"), and **Cout** ("Carry out")



Step 5:

Name the circuit and drag the inputs/outputs to match the diagram below.

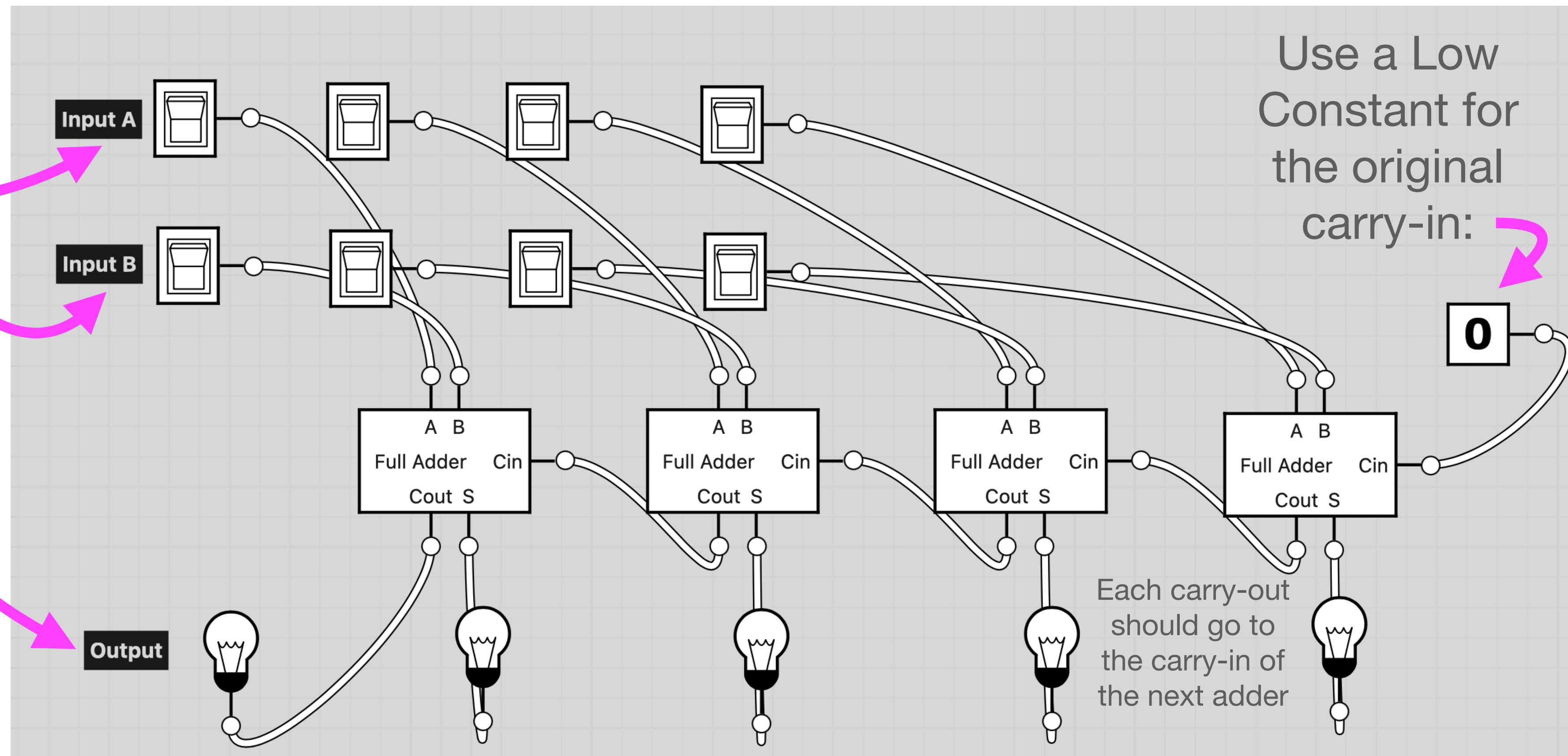
The screenshot shows the logic.ly interface for creating an integrated circuit. The title bar reads "logic.ly". Below the title bar, the heading "Create Integrated Circuit" is displayed. There are two text input fields: "Full Name" and "Symbol Label (optional)", both containing the text "Full Adder". Below the input fields, the instruction "Drag the connectors below to change the layout." is shown. The main area contains a diagram of a Full Adder block on a grid. The block has three input pins on the top: "A", "B", and "Cin". There are two output pins on the bottom: "Cout" and "S". Green arrows point to each of these pins, indicating where to drag connectors. At the bottom of the interface, there are two buttons: "Cancel" and "Create New Circuit".

When finished, click "Create New Circuit"

Step 6:

Using four full adders (under "Custom" in the left panel), two 4-bit inputs (with four switches), and five light bulbs (4 bits output, plus a carry out), assemble your 4-bit adder

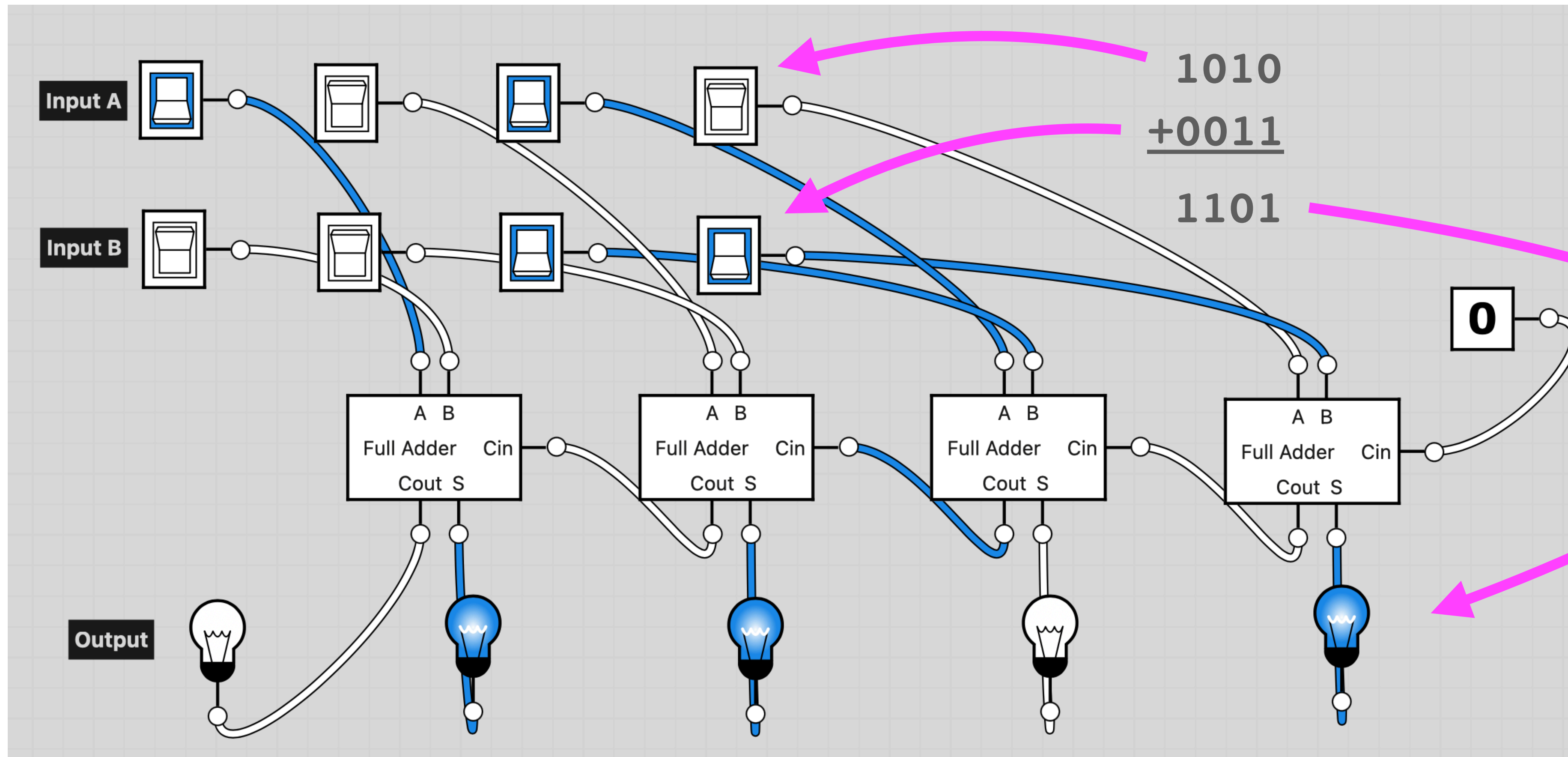
Drag out and name labels for the inputs and output.



Step 7:

Test your adder!

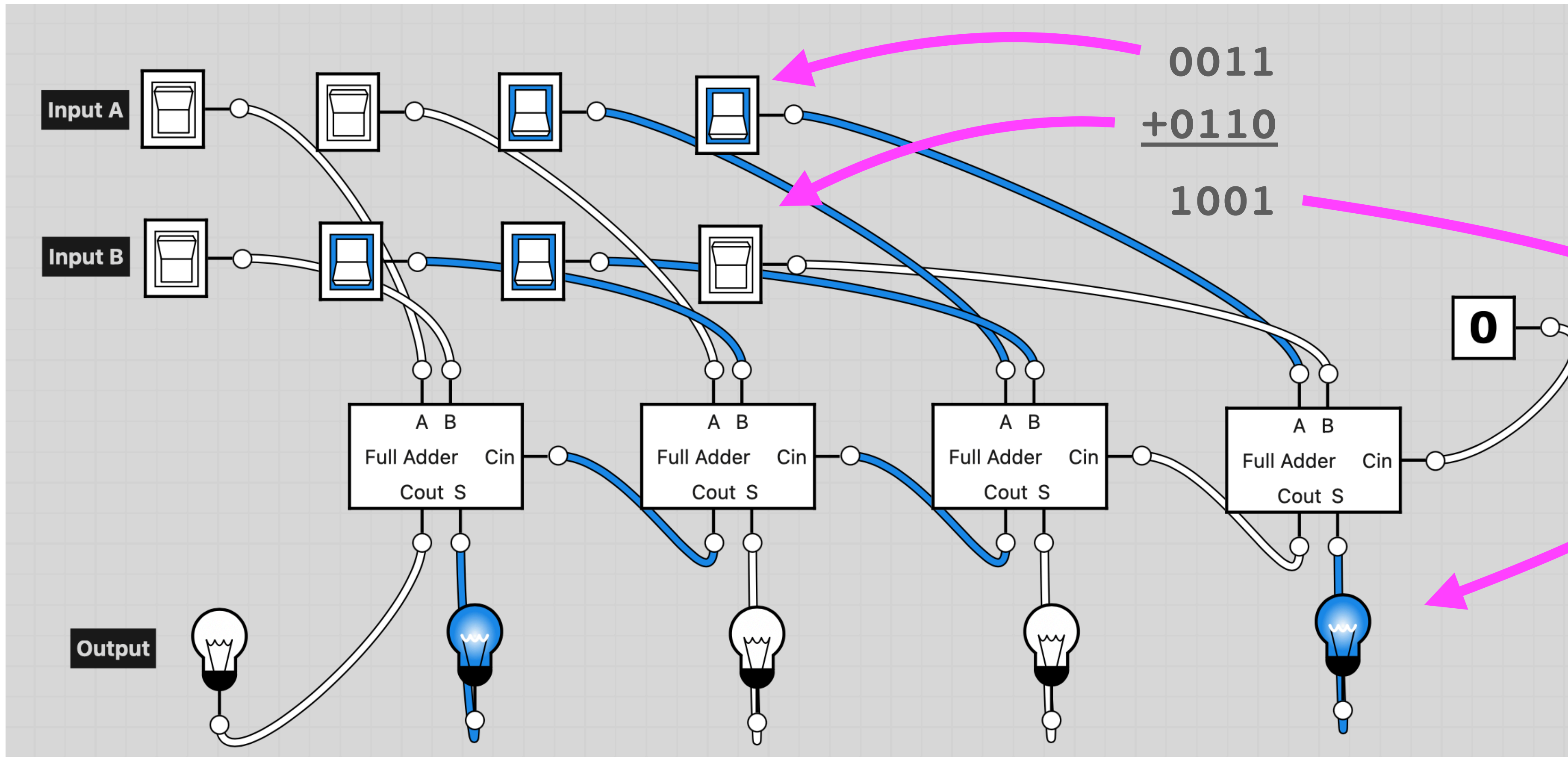
e.g., $10 + 3 = 13$



Step 7:

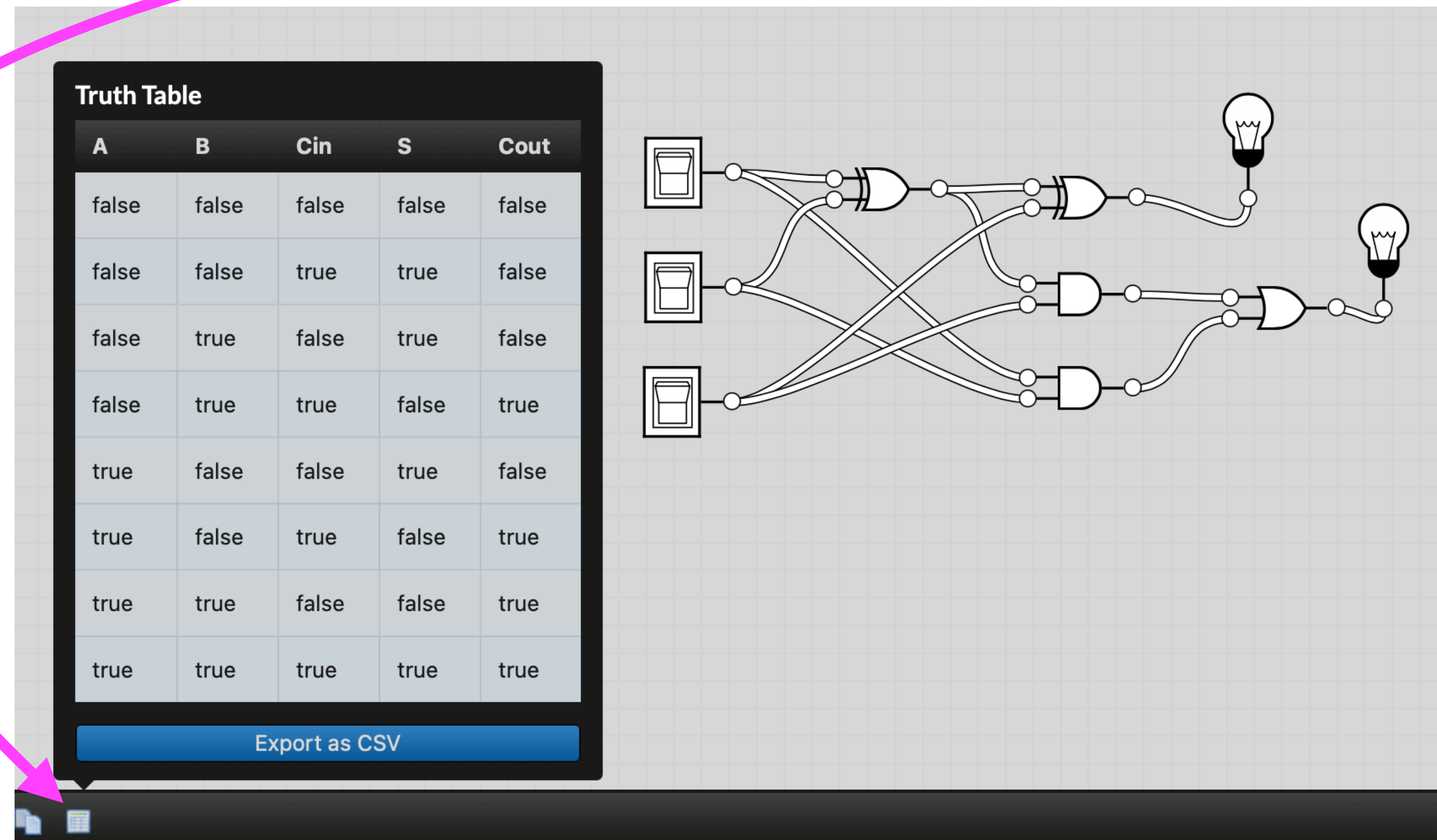
Test your adder!

e.g., $3 + 6 = 9$



Post:

If you right/ctrl-click on your adder's symbol under "Custom" in the left-hand panel, you can select "View Integrated Circuit" and then click the "Generate Truth Table" button to get the truth table:



The screenshot displays a logic simulator interface. On the left, a window titled "Truth Table" shows the following data:

A	B	Cin	S	Cout
false	false	false	false	false
false	false	true	true	false
false	true	false	true	false
false	true	true	false	true
true	false	false	true	false
true	false	true	false	true
true	true	false	false	true
true	true	true	true	true

Below the table is a blue button labeled "Export as CSV". To the right of the truth table is a circuit diagram with three input switches on the left, connected to a network of logic gates (AND, OR, XOR) that produce two outputs, each represented by a light bulb. A pink arrow points from the text above to the "Export as CSV" button.