

CSCB58 Lab 1: Introduction to the Design Tools

1 Introduction

This week, we introduce the hardware design tools we will use in this course. The majority of the labs use design tools that are loaded on the PCs in the lab, and you should spend as much time as necessary in this lab to make sure you are comfortable with these tools. If you run into problems or have questions, ask the TA or see if another student near you can help.

After this lab, you should be able to:

- Use Logisim-Evolution to build a circuit.
- Test and understand your circuit design.

Before lab, read through the Logisim-Evolution beginner's tutorial and download the reference document provided in the next section so that you have a high-level understanding of the steps required for the lab. The TA will be available to answer questions during lab or to help you if you get stuck, but you must be familiar with the steps to complete the lab in two hours.

2 Obtain the Software

With Logisim-Evolution, it is easy to work on the labs on almost any computer. The software can be downloaded free at this link:

<https://github.com/reds-heig/logisim-evolution/releases/download/v3.3.0/logisim-evolution-3.3.0-all.jar>

The software simply needs a working Java installation. If you are unable to get this working, make sure you try to search for help online, or ask your TA in your first lab section.

3 Logisim-Evolution Tutorial

Before the lab, you should be familiar with the basics of creating a simple logic circuit in Logisim-Evolution. Logisim-Evolution has a built-in beginner's tutorial available on the menubar: **Help** → **Tutorial**.

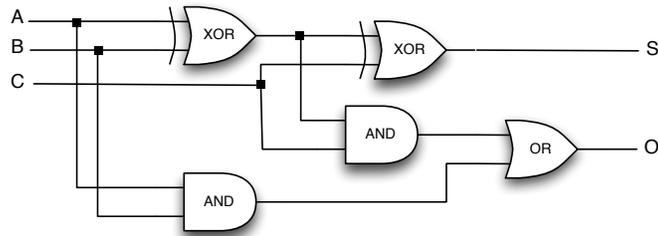
Before the lab, complete the Logisim Beginner's Tutorial (step 0-4).

In addition to a built-in tutorial in Logisim-Evolution, there is a reference document available at the following link:

https://cscb58f20.ml/docs/logisim_reference.pdf

This contains a birds-eye view of the main sets of features you will find useful during the semester. You should look at the in-built tutorial for further details.

4 Mystery Circuit



Investigate the operation of the circuit shown in the figure. In lab, create a new project, populate it with a schematic, and test the circuit to determine how the circuit behaves. On a sheet of paper or in a text document, create a truth table of all possible inputs to the circuit and the resulting outputs.

5 Summary of TODOs

Below is the summary of the steps to be completed for this lab:

1. Before the lab, read through the Logisim Beginner's tutorial, download the reference document, and/or install the tools on your own computer. No prelab report submission is required for this lab.
2. Meet your TA on Zoom and get yourself familiar with how the labs work.
3. Predict the behaviour of the mystery circuit before implementing it.
4. Implement the mystery circuit using Logisim-Evolution.
5. Test the circuit, and create a truth table for all possible input combinations.
6. Using Logisim-Evolution's poke tool and your truth table, explain the operation of the circuit to your TA.

Evaluation (5 marks in total):

- 1 mark for attending and making an honest effort
- 2 mark for having the circuit working in Logisim-Evolution.
- 2 mark for the truth table and explaining what the circuit does.

You need to be able to make reasonable explanations about any details to the TA.