

Ramaiah Institute of Technology
(Autonomous Institute, Affiliated to VTU)

Department of CSE

Programme: B.E
Course: Computer Organization

Term: Jan to May 2019
Course Code: CS45

Activity V: Designing an ALU to perform arithmetic and logical functions using Logisim simulator.

Name: N.Sai Sanjith	Marks: /10	Date:
USN: 1MS18CS079	Signature of the Faculty:	

Objective: To simulate the working of Arithmetic and Logical Unit using simulator.

Simulator Description: Logisim is an educational tool for designing and simulating digital logic circuits. With its simple toolbar interface and simulation of circuits as you build them, it is simple enough to facilitate learning the most basic concepts related to logic circuits. With the capacity to build larger circuits from smaller sub circuits, and to draw bundles of wires with a single mouse drag, Logisim can be used (and is used) to design and simulate entire CPUs for educational purposes.

Activity to be performed by students:

List out the steps in designing ALU

Name:- N Sai Sanjith
USN:- 1MS18CS079
LAB 5
Steps in designing ALU

Step 1: Add 2 input pins
Drop two East-facing input pins on the 4 bits each
Label A and B, and ensure that each input is 4 bits

Step 2: Add the adder/subtractor
Now we add the sub circuit earlier. select the
Circuit under the main project folder

Step 3:- Add the multiplexers
This takes on or more data inputs and generate a single output
In Logisim, multiplexer icon and drop two of them into
circuit

Step 4: add controls
Drop two pins on the circuit north-facing with 1 data
bit label them 0 and 1 respectively

Step 5: add a splitter
Now, we add splitter in our circuit that takes
on wire from the second multiplexer and splits
to 4 inputs to an OR gate - for a 4 bit ALU

Step 6: Add another OR gate and a not gate

Now we add an OR gate after the filter, which has 4 inputs. To the right of the OR gate, add a NOT gate.

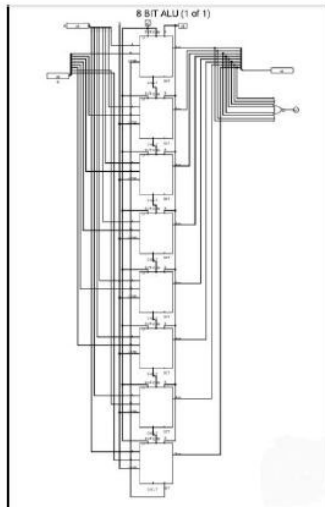
This arrangement accounts for zero. The NOT gate following the OR gate achieves this.

Finally, add a single bit pin after NOT gate to store the result. Label it zero.

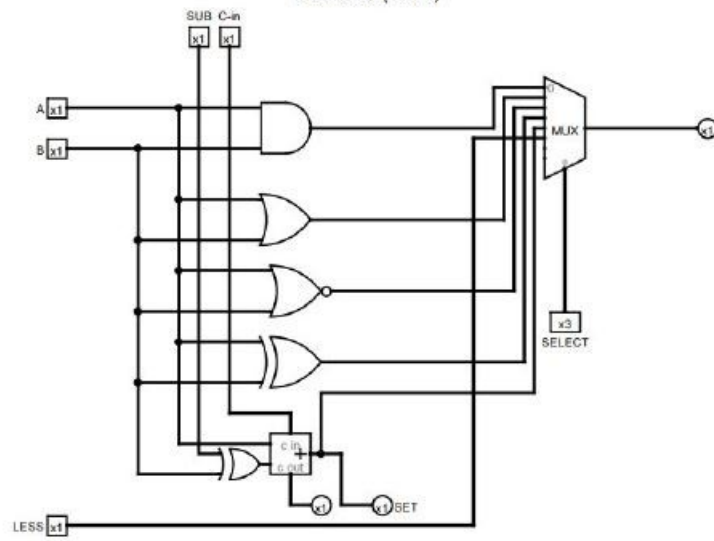
Step 7 Add a result pin for the mux

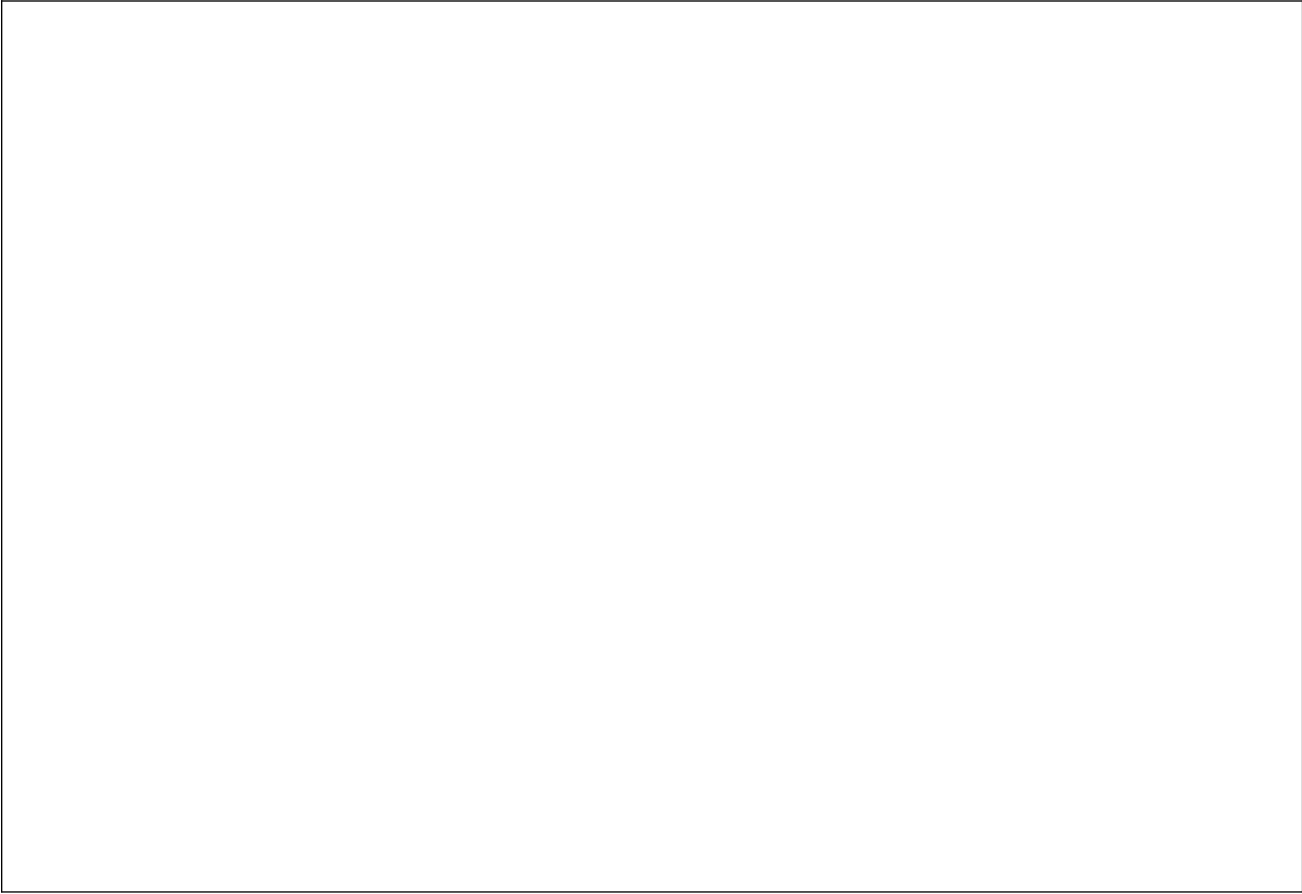
We handled the zeros coming from mux, but we also need to account for valid combination inputs from A/B and the control inputs.

Snapshots:



1 BIT ALU (1 of 1)





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Activity VI: Designing memory system using Logisim simulator.

Name: N.Sai Sanjith	Marks: /10	Date:
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Objective: To simulate the writing operation on memory.

Simulator Description: Logisim is an educational tool for designing and simulating digital logic circuits. With its simple toolbar interface and simulation of circuits as you build them, it is simple enough to facilitate learning the most basic concepts related to logic circuits. With the capacity to build larger circuits from smaller sub circuits, and to draw bundles of wires with a single mouse drag, Logisim can be used (and is used) to design and simulate entire CPUs for educational purposes.

Activity to be performed by students:

List out the steps in designing memory system

Name: N Saisanjith

USN: 1MS18CS079

Lab 6

Step 1 add RAM

Select a separate load and store operation for RAM

Step 2 :- Add Counter

Connect Counter, clock and controller buffer to the RAM

Step 3 Add TTY

To display the data

Step 4 Add Randoms Generator

To generate different address location Add inputs and another Controller Buffer to the Random generator

Step 5: Add Button

Connect Button to Counter

Observations and Snapshots:

