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

Department of CSE

Programme: B.E
Course: Computer Organization
CS45

Term: Jan to May 2019
Course Code:

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

Name: Manvendra Bansal	Marks: /10	Date: 22 -05-2020
USN: 1MS18CS069	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

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Activity V : Designing an ALU to perform arithmetic and logical functions using dogisim Simulator

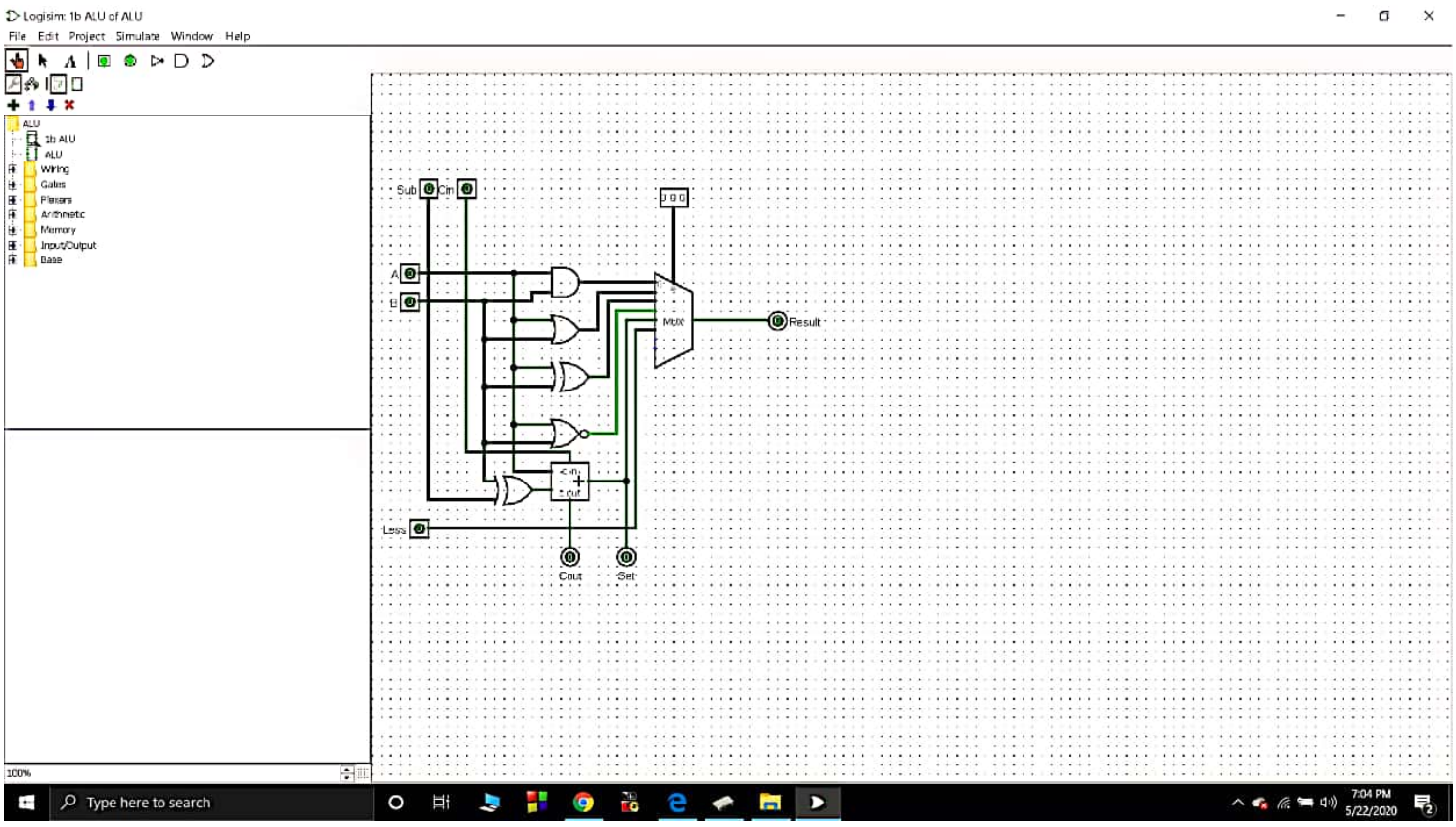
List out the steps in designing ALU

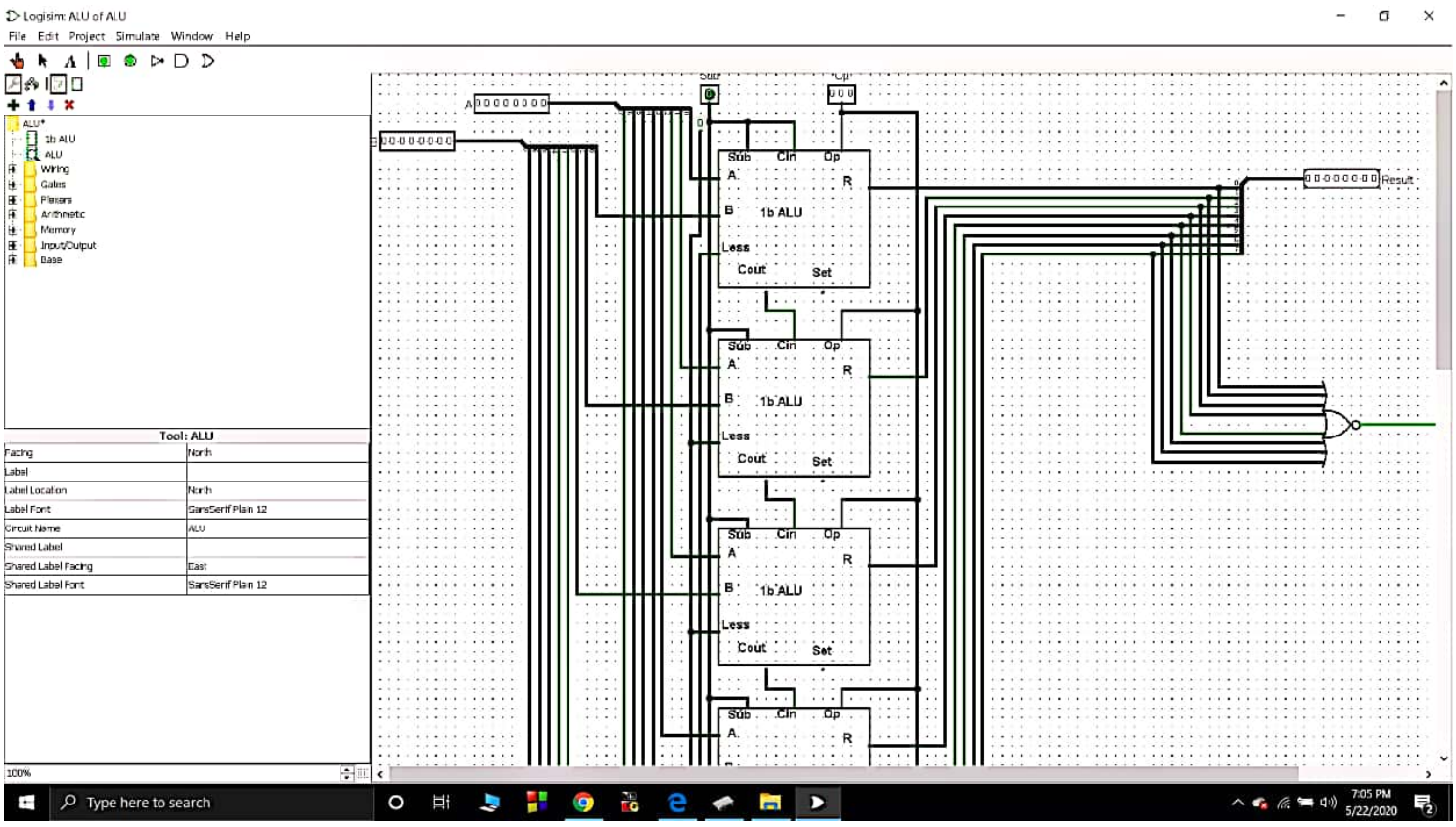
1. Add the two i/p pins, Name them A and B
2. Add OR, AND, EX-OR, NOR gates and a 1-bit adder.
3. Connect the A's and B's of all the gates to their respective pins
4. Add an output for pin and name it result.
5. Add a 1-bit multiplexer with 3 select bits.
6. Connect the outputs of all gates to the MUX.
7. Connect 3 bit input pin to MUX.
8. Add I/P pin to Cin, and output pin to Cout.
9. Add an EX-OR Gate. Connect its output to Cout. The first input must to connected B and the second to another i/p pin sub

10. Add another I/p and name it Less. Connect it to the MUX.

11. Add an output pin and name it Set, connect it to the output of adder unit.

Snapshots :





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Activity VI: Designing memory system using Logisim simulator.

Name: Manvendra Bansal	Marks: /10	Date: 22-05-2020
USN: 1MS18CS069	Signature of the Faculty:	

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

Observations and Snapshots:

Activity VI : Designing memory system using Logisim Simulator

List out the steps in designing memory system :

1. Add a RAM with separate load and store selected.
2. Add a counter and connect Q to A of the RAM.
3. Add a controller buffer and connect its o/p to the RAM.
4. Add a clock and connect to the Input of the buffer.
5. Add a TTY unit with 32 rows and columns. Make the connections with RAM.
6. Add a 7 bit random number generator, connect Q to D.

7. Add another controller buffer, connect to TTY. Also add an I/p pin to the buffer.
8. Connect the output of the second buffer to the Counter.
9. Connect a button to the counter.

Snapshot :