

**VASAVI COLLEGE OF ENGINEERING (Autonomous)**  
IBRAHIMBAGH, HYDERABAD – 500 031  
**Department of Computer Science & Engineering**

**INNOVATION IN TEACHING**

**Course Name:** Logic and Switching Theory (LST)

**Faculty Name:** Dr. D. Baswaraj

**Topic:** Realization of Boolean Functions

**Year/Sem:** IV Sem

**Teaching Aid / Tool Used:** Logisim Simulator

**Description of the Tool:** It is an open source educational tool for designing and simulating digital logic circuits, featuring a simple-to-learn interface, hierarchical circuits, wire bundles, and a large component library. As a Java application, it can run on many platforms.

**Features**

- Design circuits using an intuitive graphical interface
- Watch the circuits be simulated as they are drawn
- Runs under Linux, MacOS X, and Windows
- Build circuits from truth tables using combinational analysis module

**Tools Usage in Teaching:**

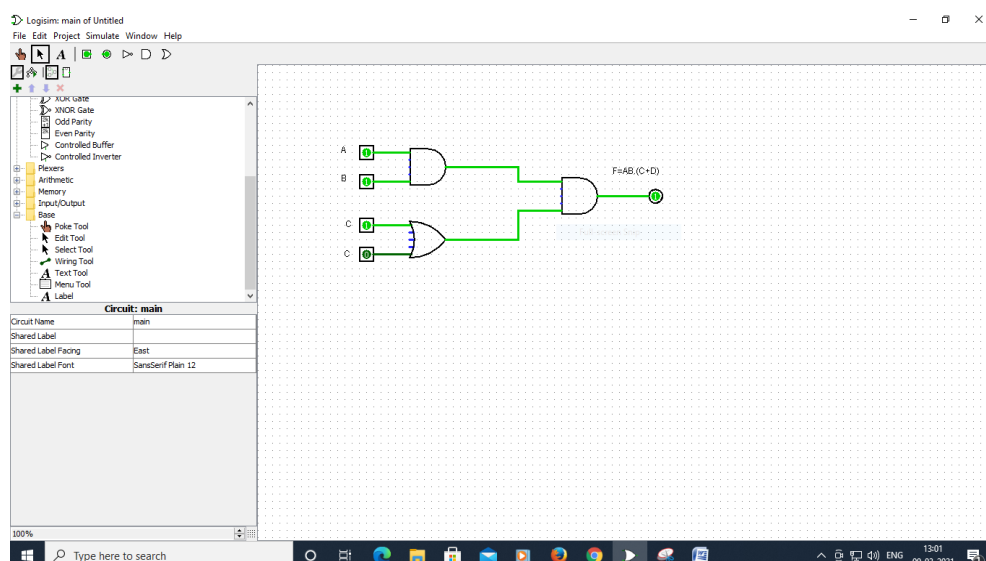
Before using the tool, make ensure that, your system/laptop have to install the Logisim simulation software along with Java. This tool can be used in teaching field to demonstrate the working principle of various Logic circuits (combinational and sequential) like counters, multiplexors, priority encoders, memory design, realization of circuits etc.

In order to understand the tool usage, consider the an example to Simulate the realization of Boolean function  $F = AB.(C+D)$  using NAND Gates.

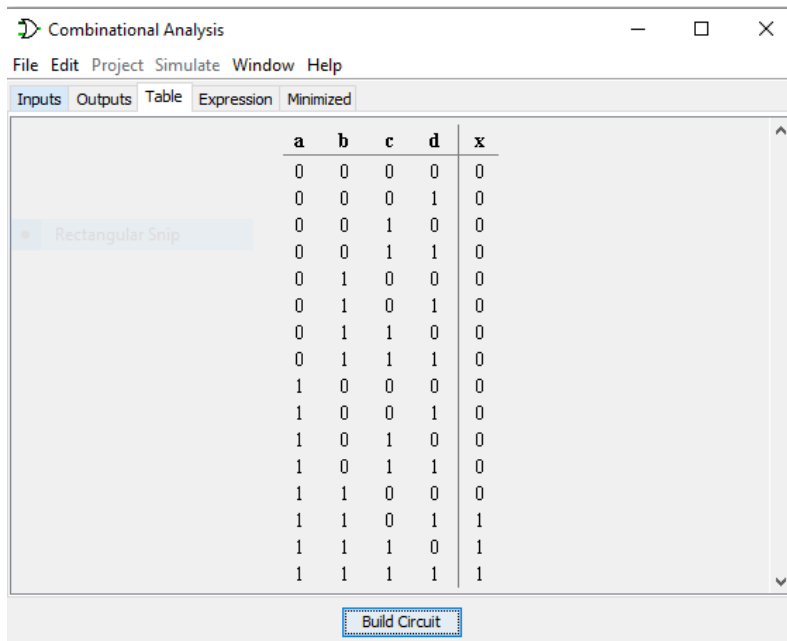
**Solution:**

**Step-1:** Invoke the Logisim tool by clicking Logisim icon to get home page of the tool.

**Step-2:** The given function designed by using base gate components shown in top left corner of screen as shown below:

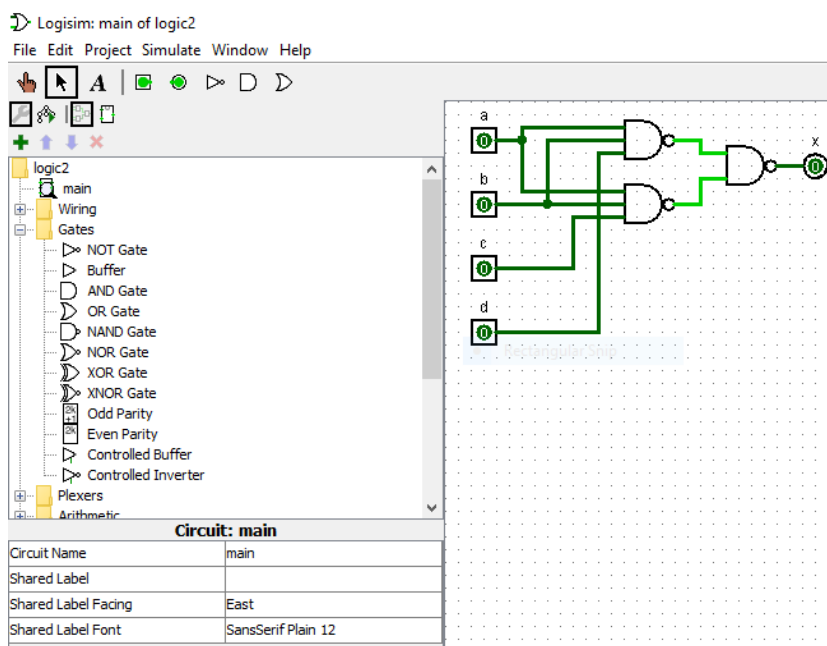


**Step-3:** By selecting the analyze circuit from project option shown in main menu of tool, to get truth table of the given circuit as shown below:



a	b	c	d	x
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

**Step-4:** By clicking Build circuit from truth table, we get the circuit using NAND gates only as shown below:



**Step-5:** To verify the each entries of truth table, click the rectangle part at each input, to toggle input value 0 or 1 to get the corresponding output at output X automatically.

**Step-6:** Save the circuit with filename with extension as .circ and exit the tool.

**Reference(s):**

Download Link / URL with Latest version: <https://sourceforge.net/projects/circuit/files/>