Mode of Evaluation (DLD)	(%)
1. Mid-sem + Viva	(15+5)
2. End-sem + Viva	(25+5)
3. Surprise Quizzes	10
4. Schedule Quiz	15
5. Assignments	5
6. Lab (Continuous, report, Exam)	20

Simulation software	
Java	https://java.com/en/download/
Logisim	https://sourceforge.net/projects/circuit/

Lab report: Hand written + Simulation (file)

Consists of following sections:

- Title of the Lab experiment
- Name, Roll-no, Sec

1. Objective of the experiment
2. About the experiments (procedure/diagram/programme source code/flowchart etc)
3. Your observation/what you learned

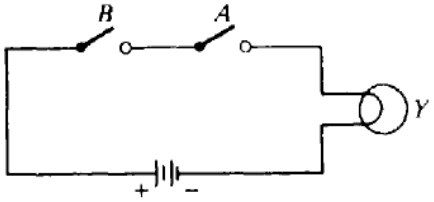
After complementation of the LAB, document has to be uploaded in Google classroom within **given deadline**

filename: Rollnumber_lastname

Logic gates

- Logic gates are **the basic building blocks of any digital** electronic circuits
- Operates on one/more input signals to produce output
- Input elect. signal **(0-2.5/3V)** could be either **High** or **Low**
- High – **logic 1**, Low- **logic 0**

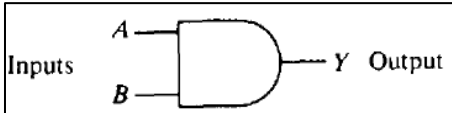
Gates: AND, NAND



AND circuit using switches

Input switches		Output light
B	*A*	*Y*
open	open	no
open	closed	no
closed	open	no
closed	closed	yes

Truth table



AND-gate symbol

Inputs		Output
B	*A*	*Y*
0	0	0
0	1	0
1	0	0
1	1	1

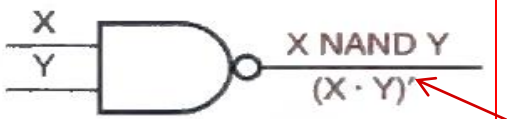
0 = low voltage
1 = high voltage

3-input AND gate symbol

$A \cdot B \cdot C = Y$

Inputs			Output
C	*B*	*A*	*Y*
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

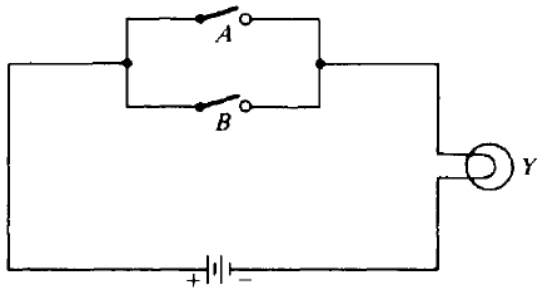
Truth table with three variables



X	Y	X NAND Y
0	0	1
0	1	1
1	0	1
1	1	0

Complement

Gates: OR, NOR



OR circuit using switches

Input switches		Output light
B	*A*	*Y*
open	open	no
open	closed	yes
closed	open	yes
closed	closed	yes

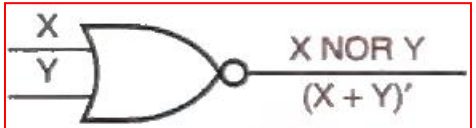
Truth table

OR-gate symbol

Inputs		Output
B	*A*	*Y*
0	0	0
0	1	1
1	0	1
1	1	1

0 = low voltage
1 = high voltage

OR truth table



X	Y	X NOR Y
0	0	1
0	1	0
1	0	0
1	1	0

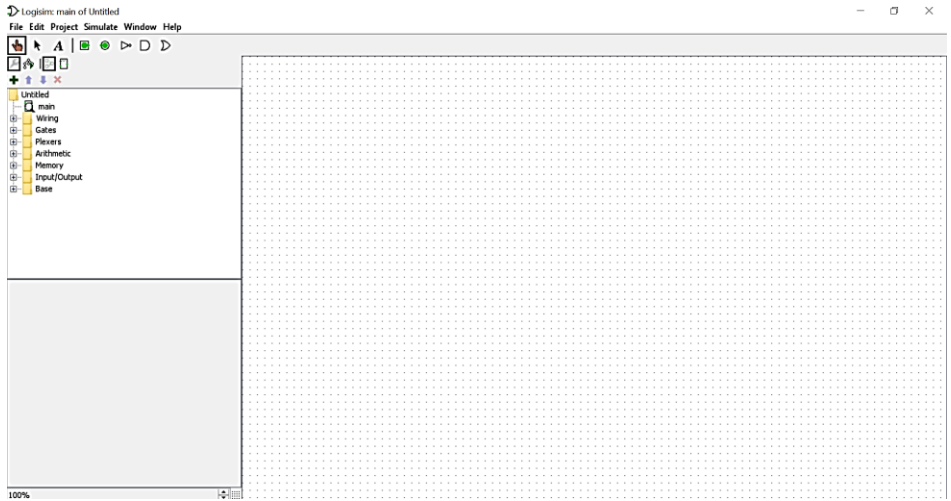
Lab1: Introduction to Logisim

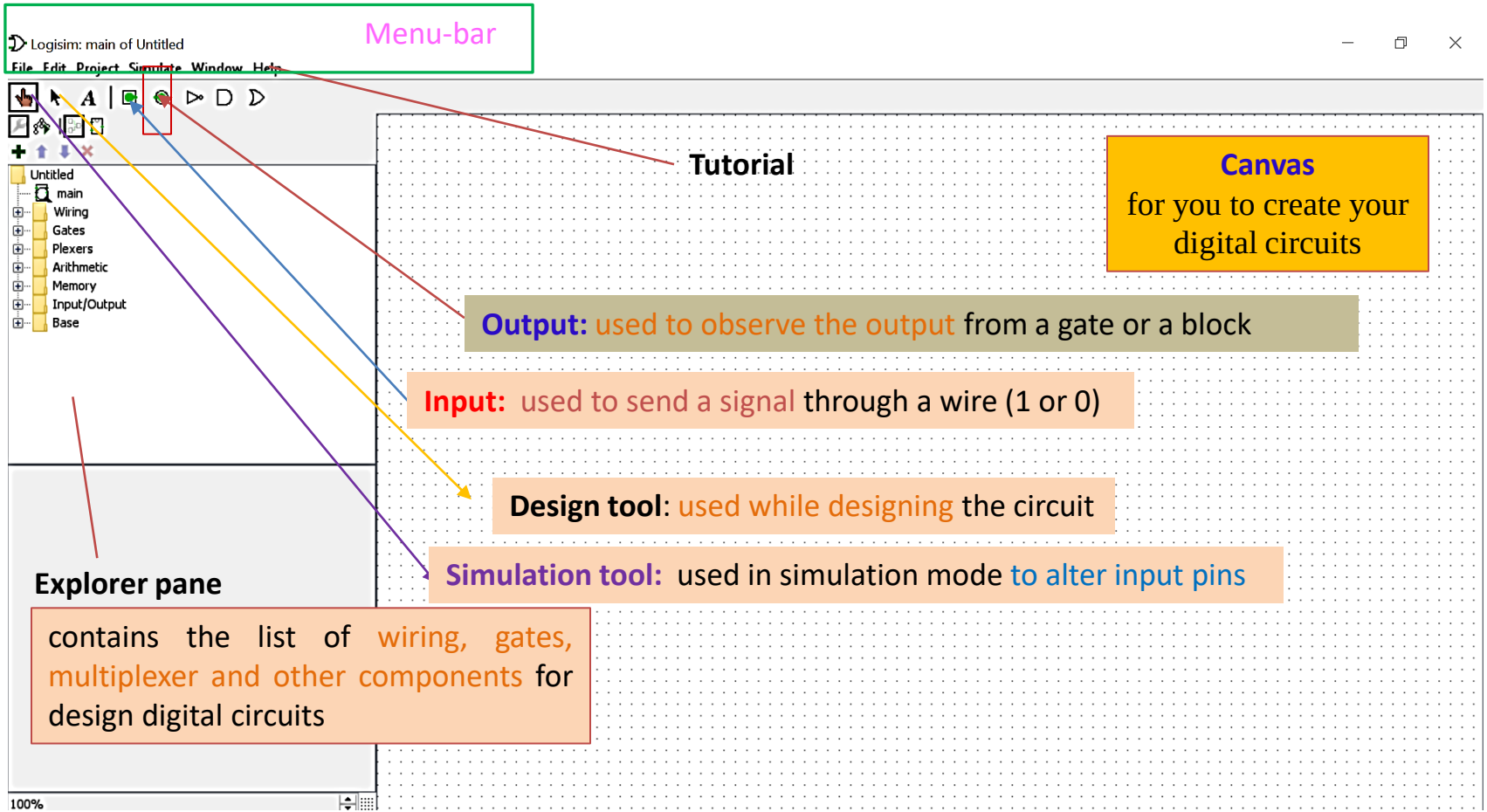
- Logisim is an software/tool for designing and simulating digital logic circuits
- It has simple and user friendly toolbar interface for simulation of circuit
- It is simple enough to facility learning the most basic concepts related to logic circuits

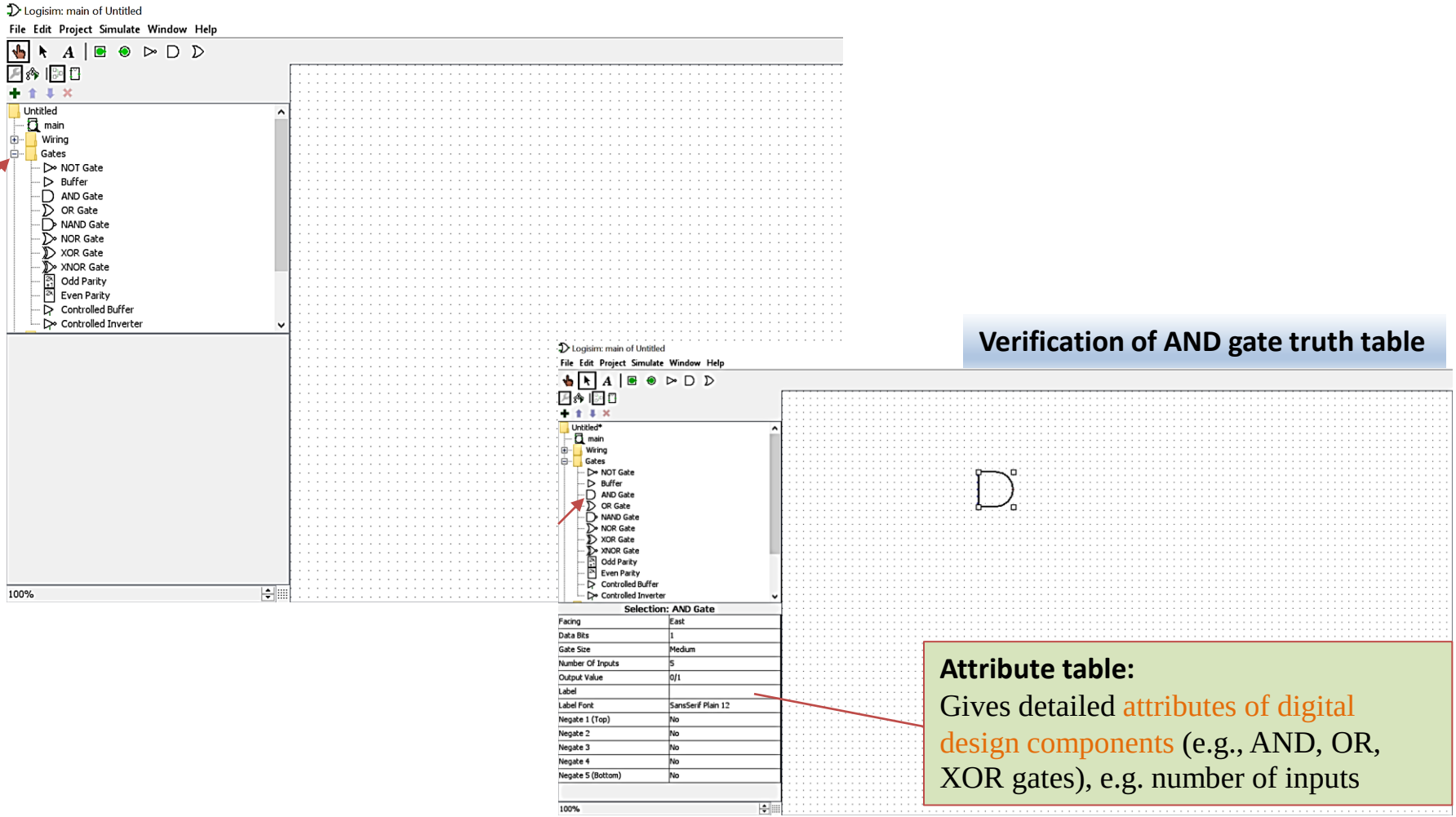
Step-1: Download and Install → a) Java https://java.com/en/download/
b) **Logisim** https://sourceforge.net/projects/circuit/

Step-2: After Install →

Step-3: Click on

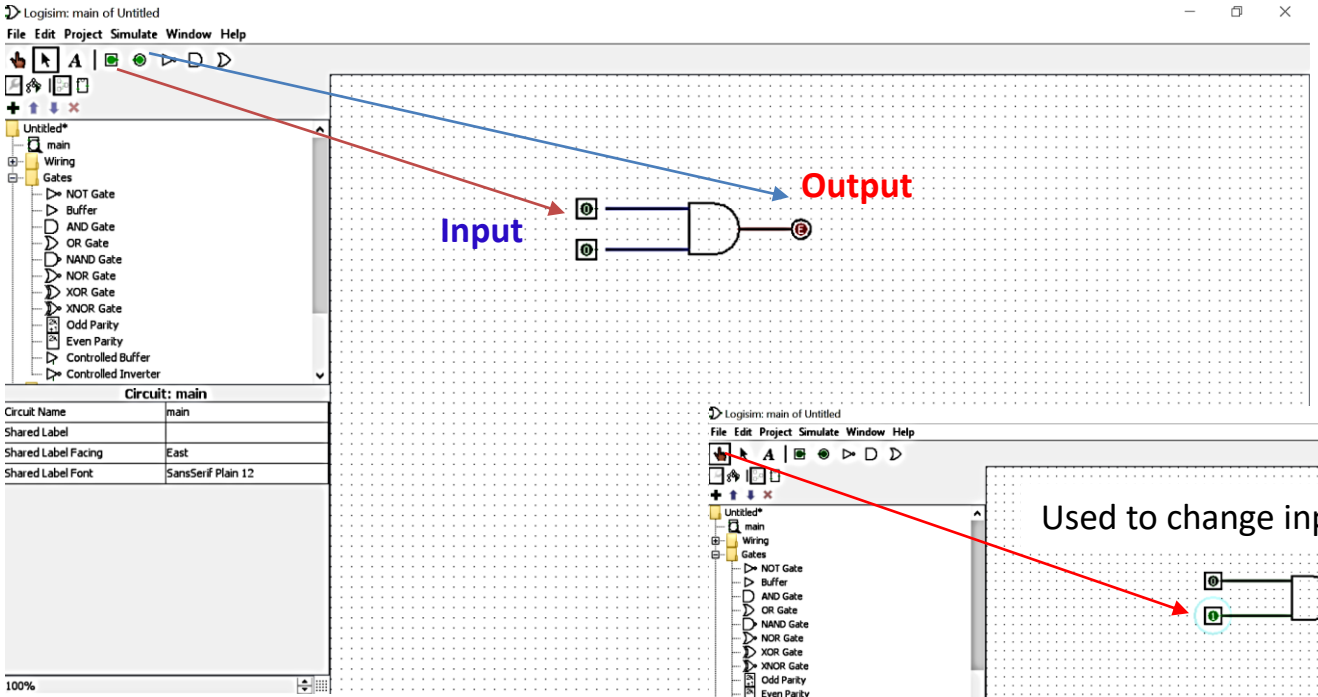


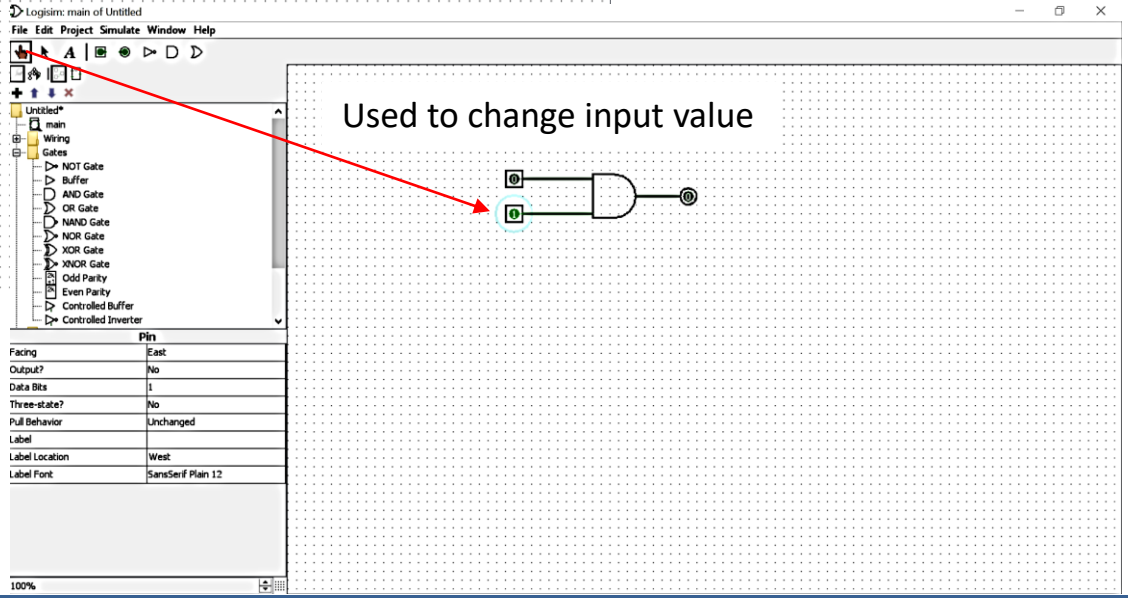

Menu-bar
Logisim: main of Untitled
File Edit Project Simulate Window Help
Untitled
main
Wiring
Gates
Plexers
Arithmetic
Memory
Input/Output
Base
100%
Tutorial
Canvas
for you to create your digital circuits
Output: used to observe the output from a gate or a block
Input: used to send a signal through a wire (1 or 0)
Design tool: used while designing the circuit
Simulation tool: used in simulation mode to alter input pins
Explorer pane
contains the list of wiring, gates, multiplexer and other components for design digital circuits



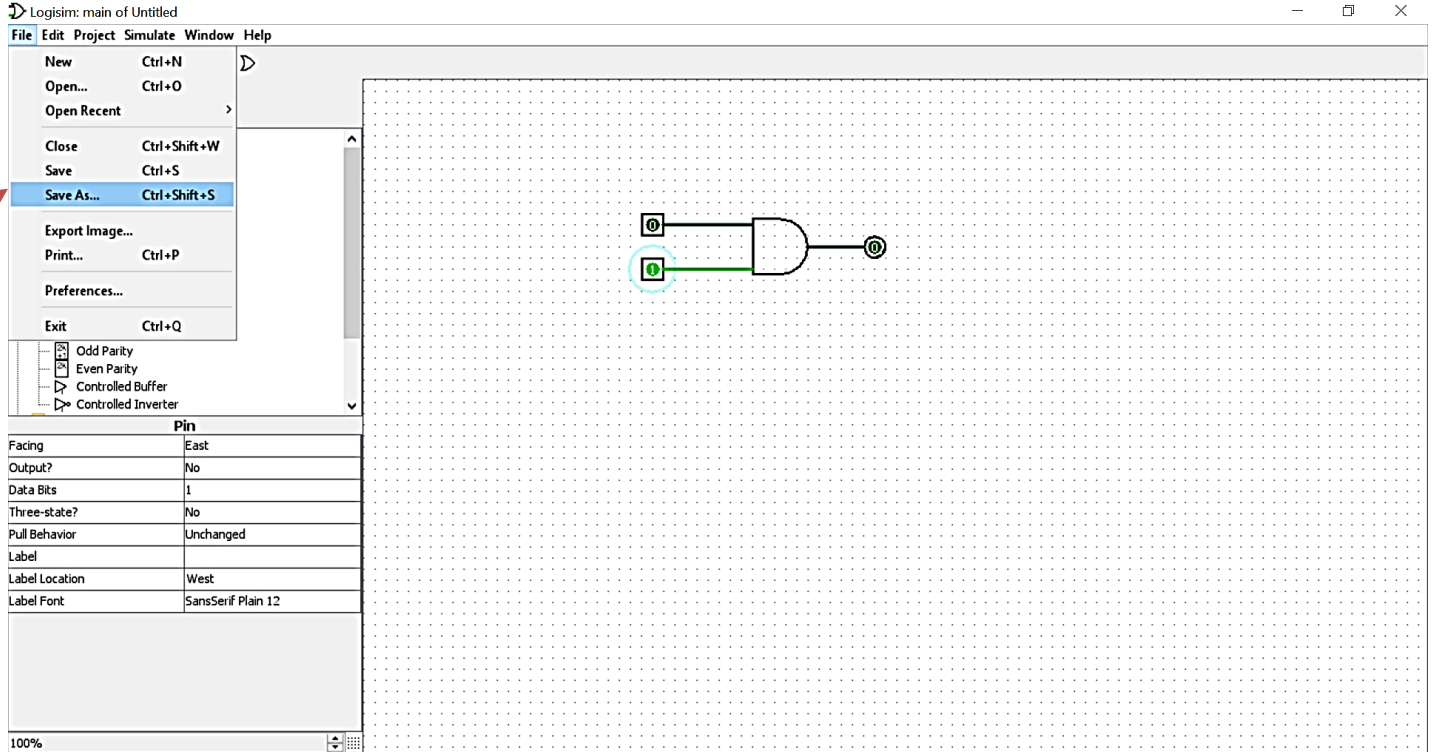
Verification of AND gate truth table

Attribute table:
Gives detailed attributes of digital design components (e.g., AND, OR, XOR gates), e.g. number of inputs


Logisim: main of Untitled
File Edit Project Simulate Window Help
Untitled*
main
Wiring
Gates
NOT Gate
Buffer
AND Gate
OR Gate
NAND Gate
NOR Gate
XOR Gate
XNOR Gate
Odd Parity
Even Parity
Controlled Buffer
Controlled Inverter
Circuit: main
Circuit Name main
Shared Label
Shared Label Facing East
Shared Label Font SansSerif Plain 12
100%
Input
Output


Logisim: main of Untitled
File Edit Project Simulate Window Help
Untitled*
main
Wiring
Gates
NOT Gate
Buffer
AND Gate
OR Gate
NAND Gate
NOR Gate
XOR Gate
XNOR Gate
Odd Parity
Even Parity
Controlled Buffer
Controlled Inverter
Pin
Facing East
Output? No
Data Bits 1
Three-state? No
Pull Behavior Unchanged
Label
Label Location West
Label Font SansSerif Plain 12
100%
Used to change input value

To Save the design



Thank you!