21. **HALF ADDER**

EXP.NO: 21

AIM: To design and implement the two bit half adder using Logisim simulator.

PROCEDURE:

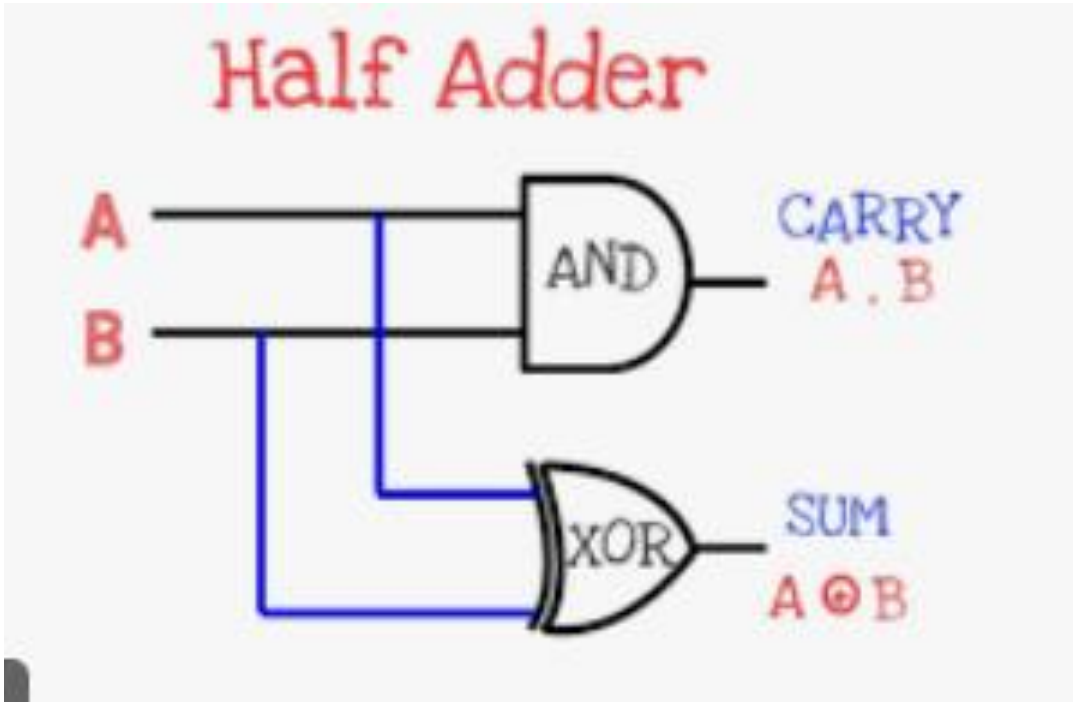
1) Pick and place the necessary gates.
2) Insert 2 inputs into the canvas.
3) Connect the inputs to the XOR gate and AND gate.
4) Insert 2 outputs into the canvas.
5) Make the connections using the connecting wires.
6) Verify the truth table.

TRUTH TABLE:

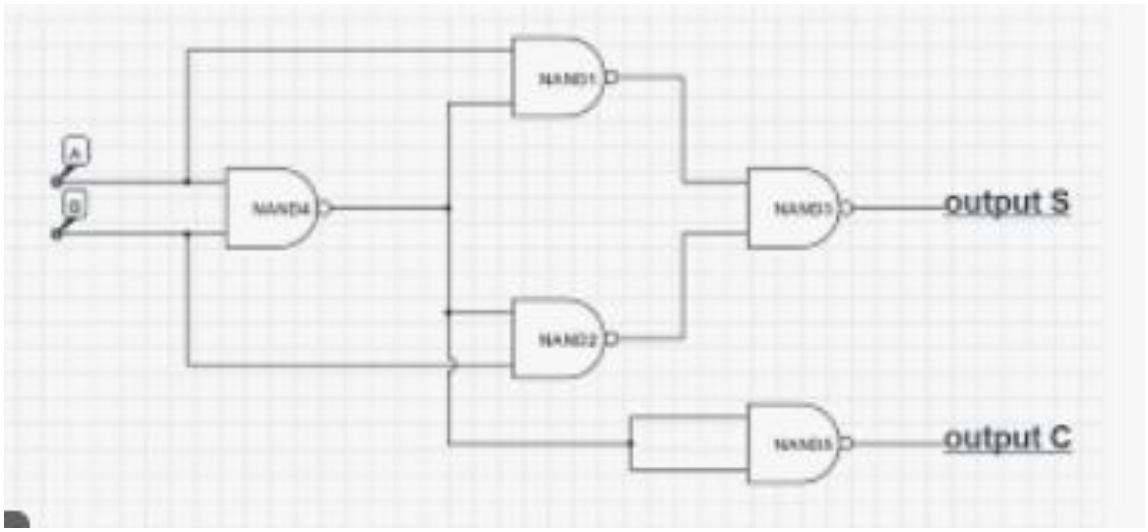
Truth Table			
Input		Output	
A	B	Sum	Carry
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

S = A XOR B C = A AND B

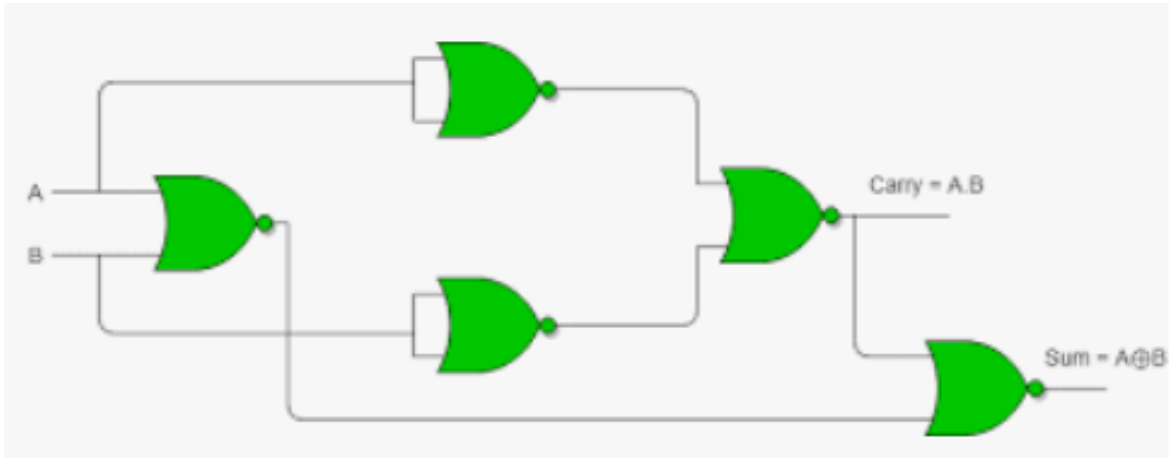
Logical Diagram:



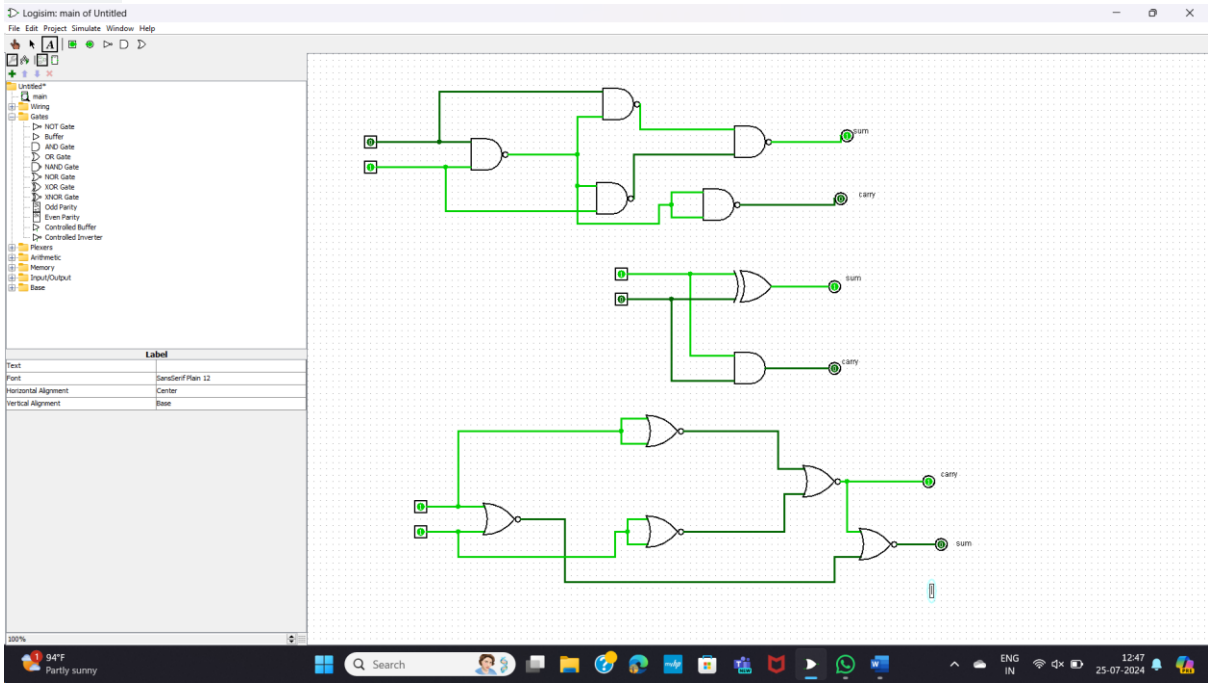
Half Adder using NAND Gates:



Half Adder using NOR Gates:



OUTPUT



RESULT: Thus 2-bit half adder has been designed and implemented successfully using logisim simulator.