23. **FULL ADDER**
EXP.NO: 23
AIM: To design and implement the full adder using Logisim simulator.
PROCEDURE:
1)   Pick and place the necessary gates.
2)   Insert 3 inputs into the canvas.
3)   Connect the inputs to the XOR gate, AND gate and OR gate.
4)   Insert 2 outputs into the canvas.
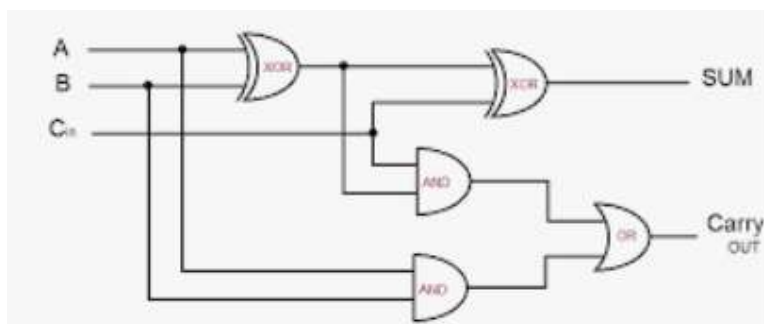5)   Make the connections using the connecting wires.
6)   Verify the truth table.
TRUTH TABLE:

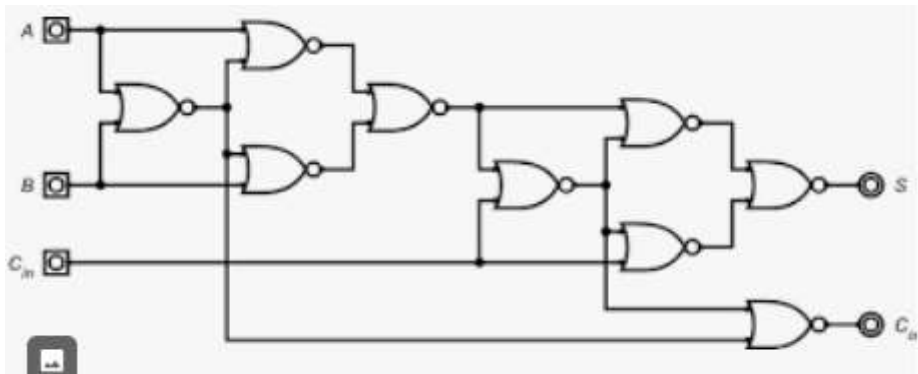| Inputs			Outputs	
A	B	C_{in}	Sum	Carry
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

Sum=(A⊕B) ⊕Cin

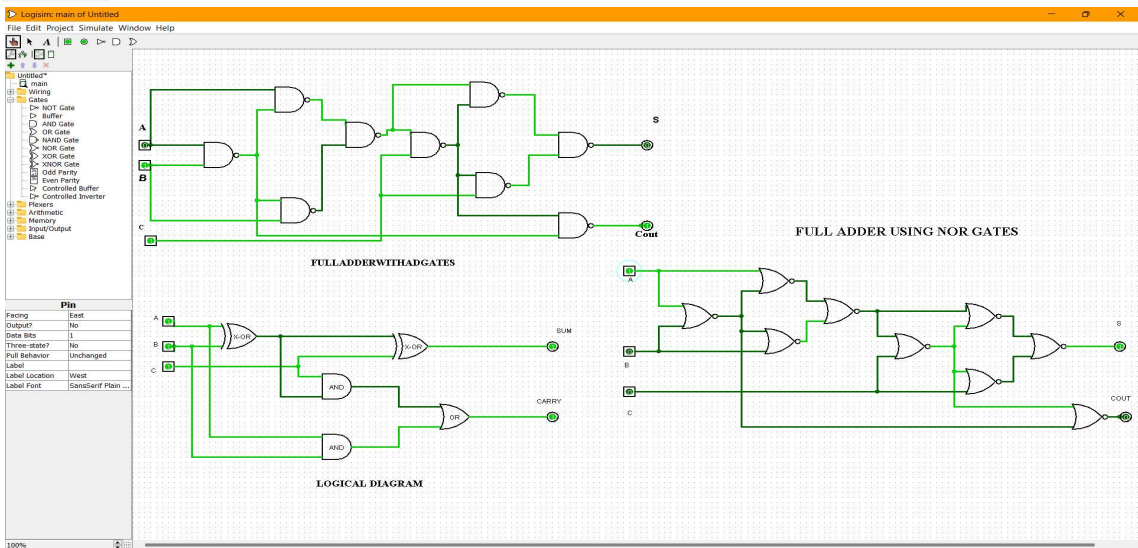Carry=A.B+ (A ⊕B)

Logical Diagram:

Full adder using NAND Gates:
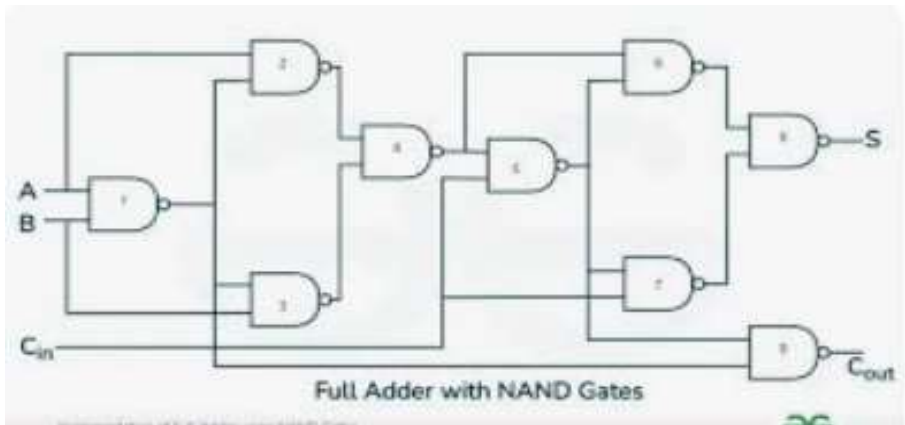
Full adder using NOR Gates:

OUTPUT

RESULT: Thus full adder has been designed and implemented successfully using logisim simulator.