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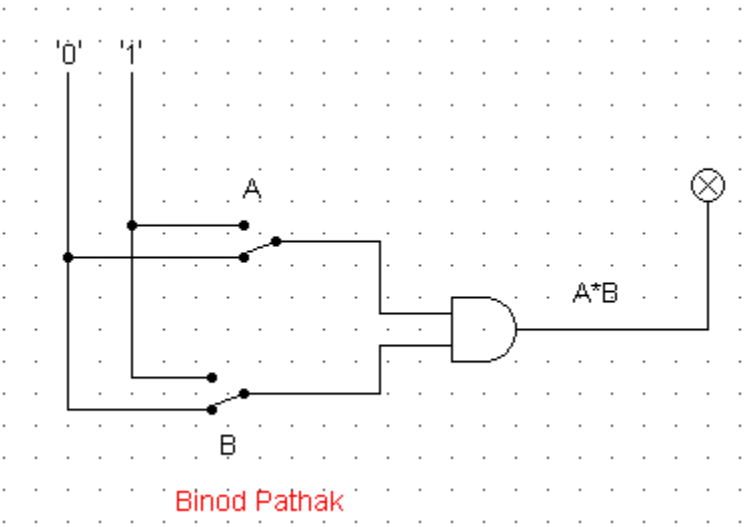
1. Draw the logic diagram of the following gates using logsim and complete the Truth tables.

a) AND
Answer:

A	B	A.B
0	**0**	**0**
0	**1**	**0**
1	**0**	**0**
1	**1**	**1**



b) NOR
Answer:

A	B	A.B
0	**0**	**1**

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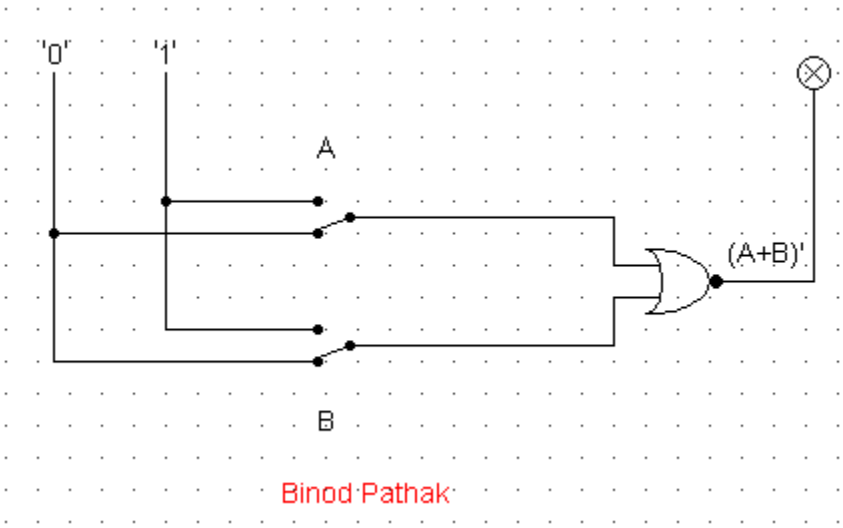
0	**1**	**0**
1	**0**	**0**
1	**1**	**0**



c) OR
Answer:

A	**B**	**A.B**
0	**0**	**0**
0	**1**	**1**
1	**0**	**1**
1	**1**	**1**

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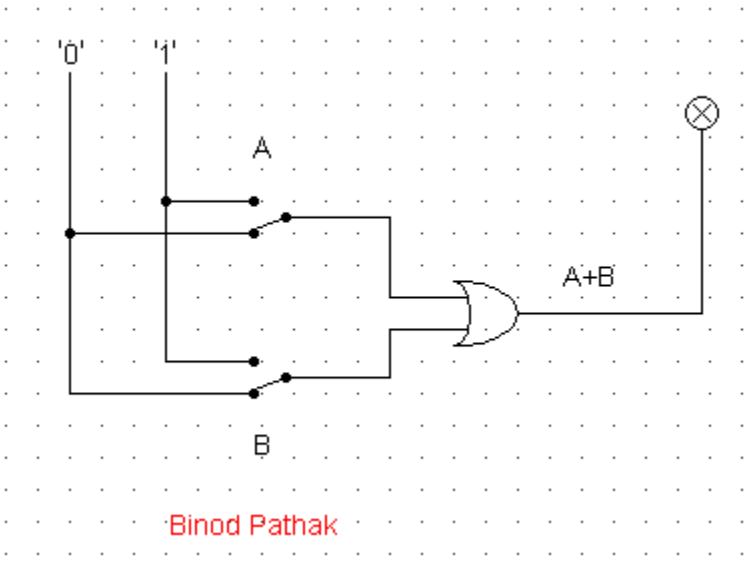

d) NAND (using NOT and AND)
Answer:

A	B	A.B
0	0	0
0	1	1
1	0	1
1	1	1

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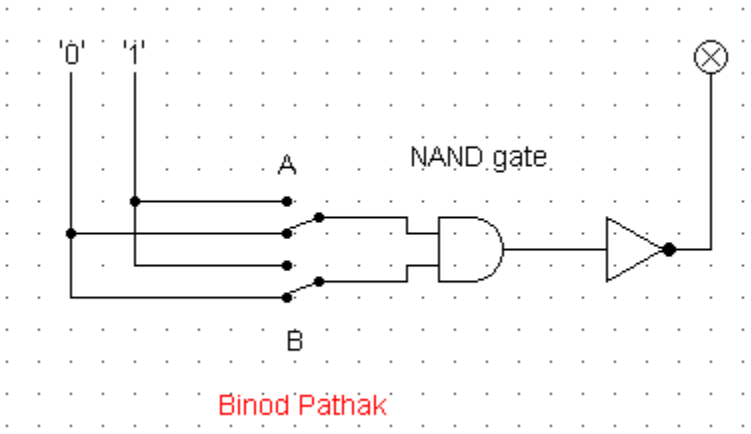

e) XOR using AOI

Answer:

A	B	(AB' + A'B)
0	0	0
0	1	1
1	0	1
1	1	0

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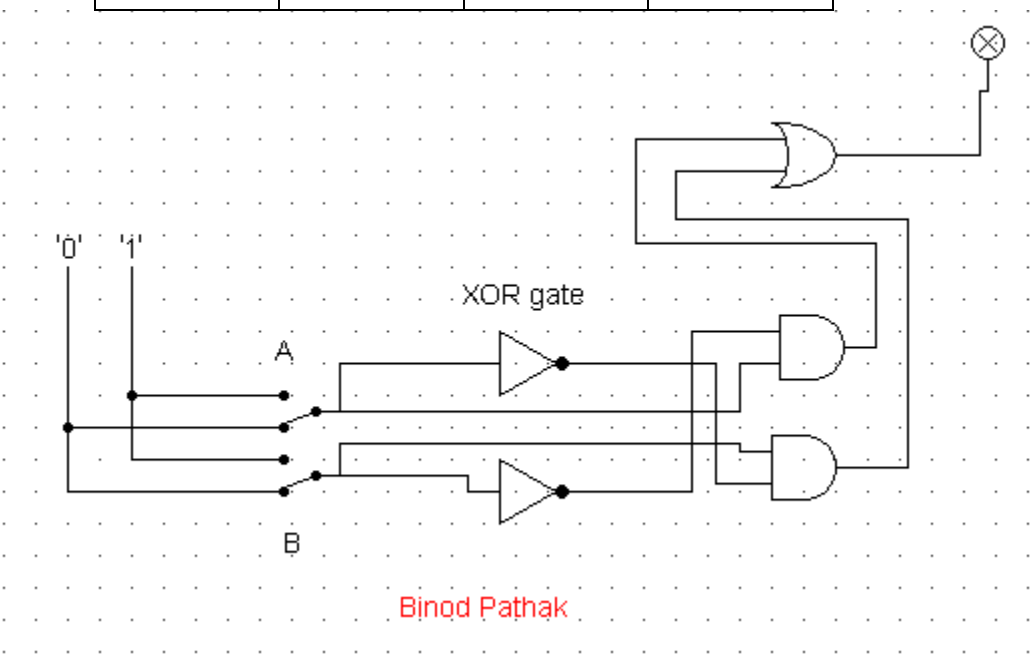
A	B	!(A+B)	!A . !B
0	0	1	1
0	1	0	0
1	0	0	0
1	1	0	0



2. Use LogSim to build the equivalent circuit for the following Boolean equations. Prove that the expressions are equivalent by computing truth table.

$$!(A + B) = !A.!B$$

Answer:

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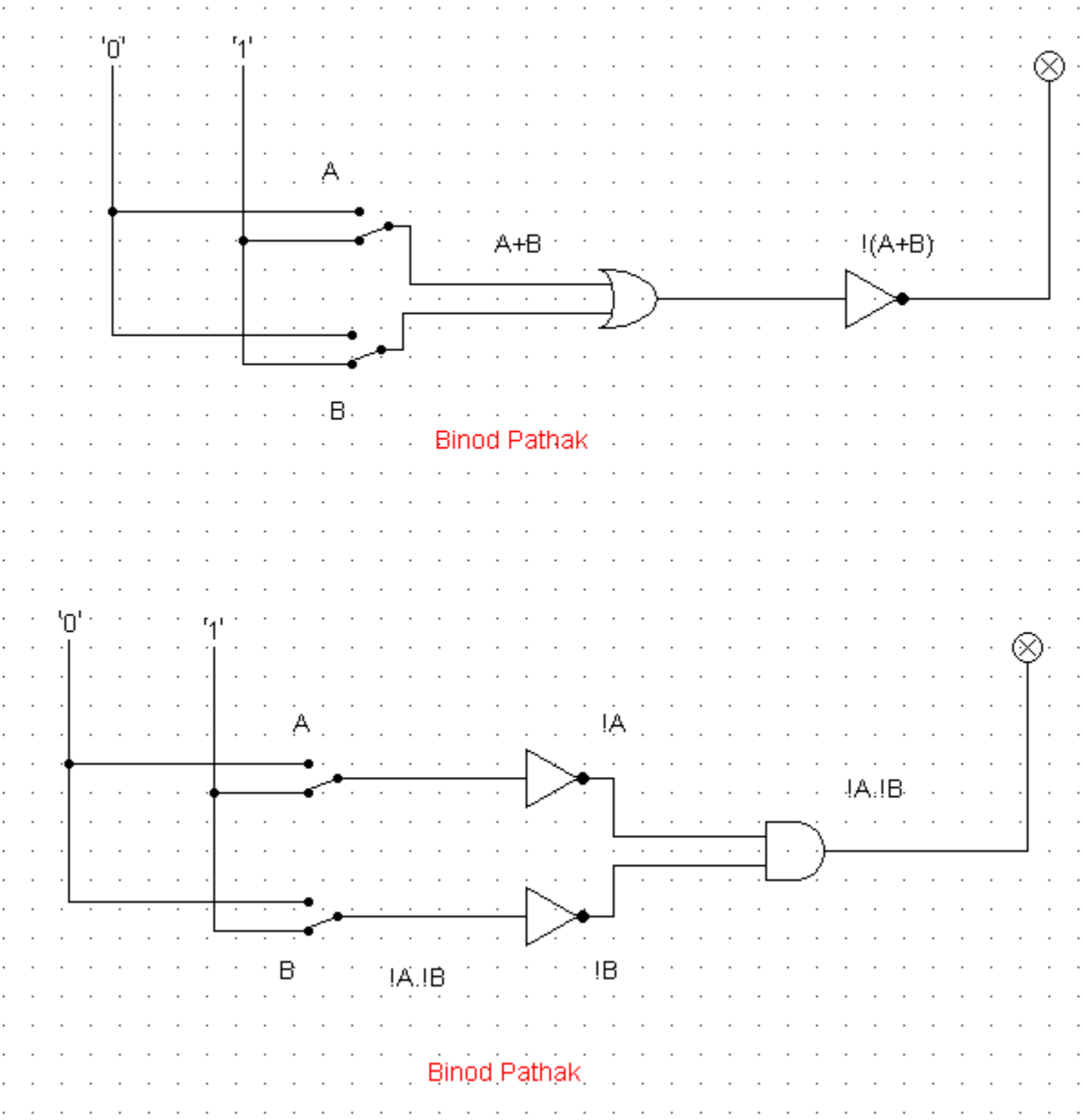

3. Draw the following circuit of half adder using LogSim.

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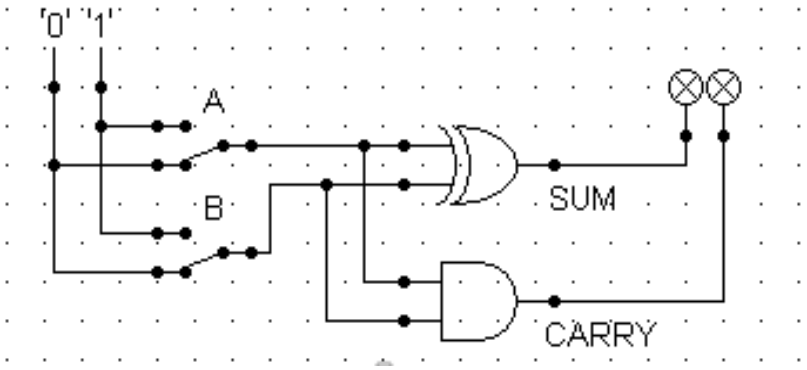
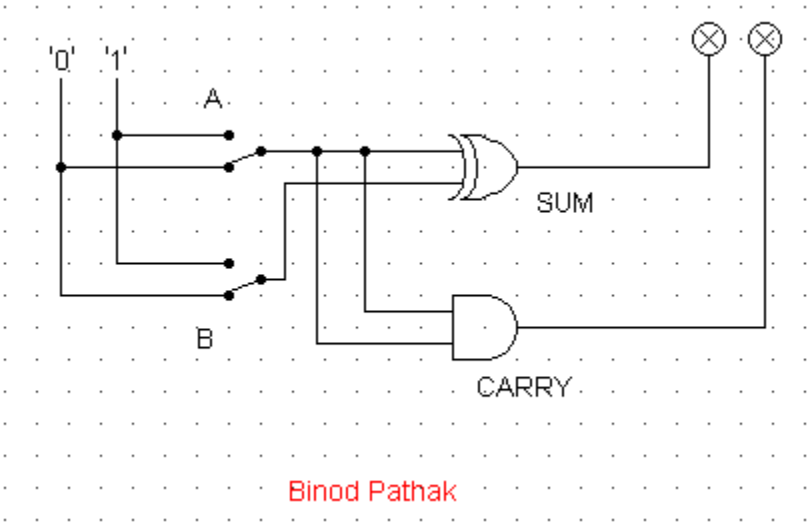


Answer:



4. Draw full adder using Logsim and construct truth table.
   Answer:

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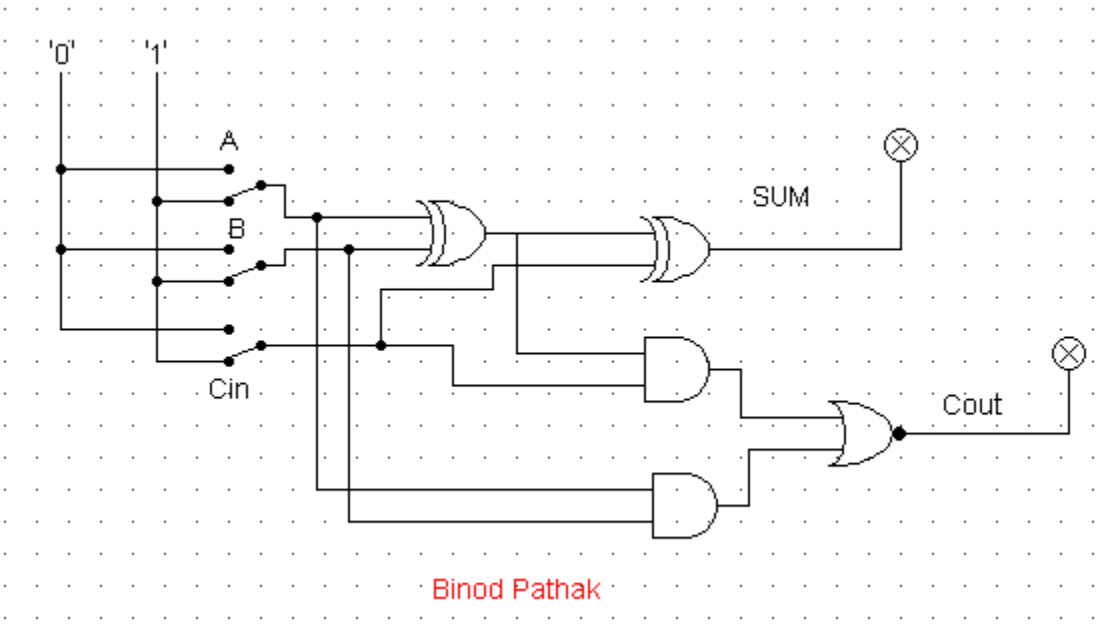
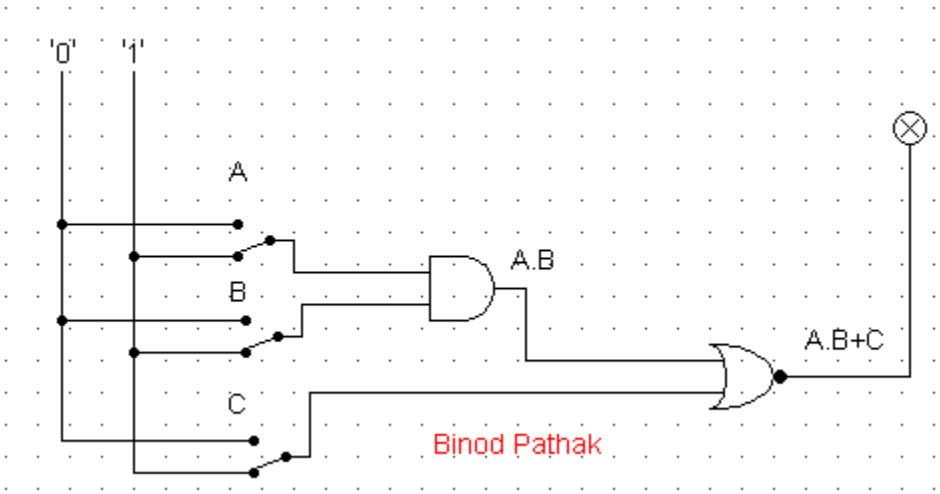


5. Draw the logic circuit for the following Boolean equations using logsim simulator.
    a. AB+C

Answer:



    b. A(B+C)

Answer:

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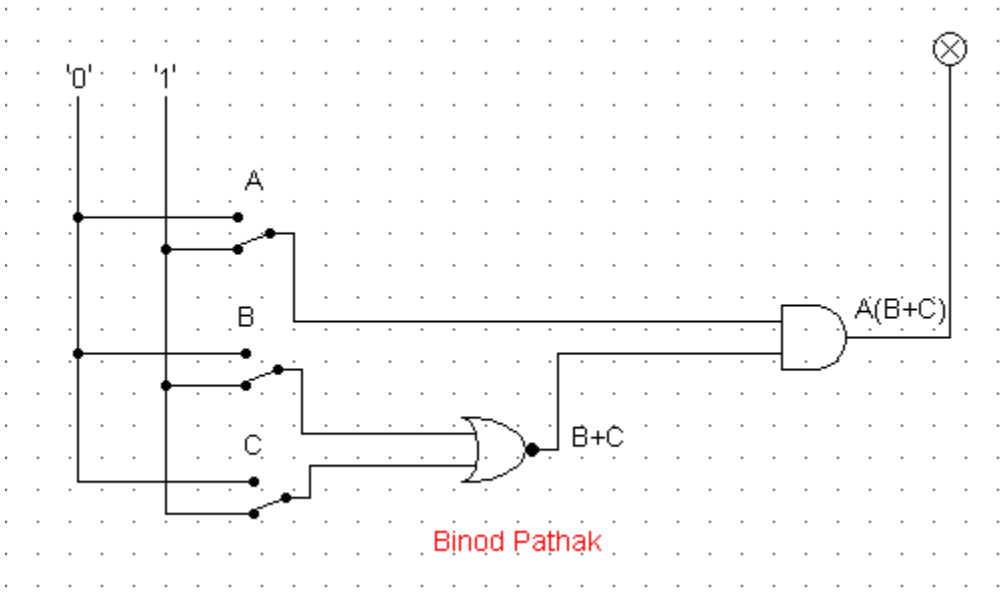

c. X'Y'Z'
Answer: