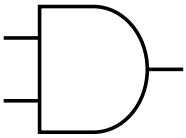
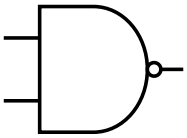
Logic Gates

Kai
2025



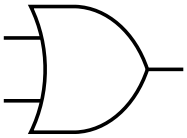
AND

input	output
0 0	0
0 1	0
1 0	0
1 1	1



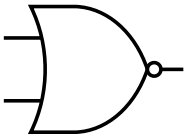
NAND

input	output
0 0	1
0 1	1
1 0	1
1 1	0



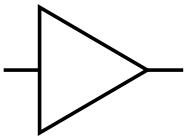
OR

input	output
0 0	0
0 1	1
1 0	1
1 1	1



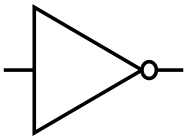
NOR

input	output
0 0	1
0 1	0
1 0	0
1 1	0



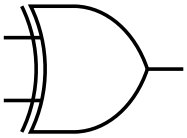
buffer

input	output
0	0
1	1



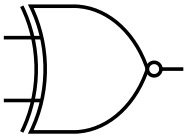
NOT

input	output
0	1
1	0



XOR

input	output
0 0	0
0 1	1
1 0	1
1 1	0

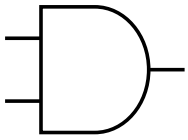


XNOR

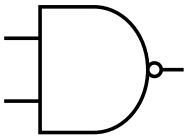
input	output
0 0	1
0 1	0
1 0	0
1 1	1

Log tables: pg 78

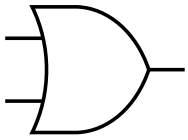
NAND = not AND
XOR = exlusive OR
buffer = does nothing
NOT = inverter



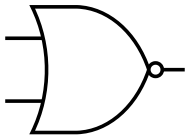
input	output



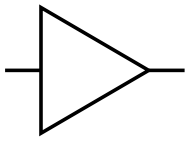
input	output



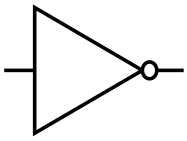
input	output



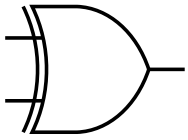
input	output



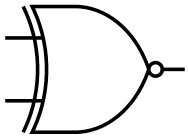
input	output



input	output

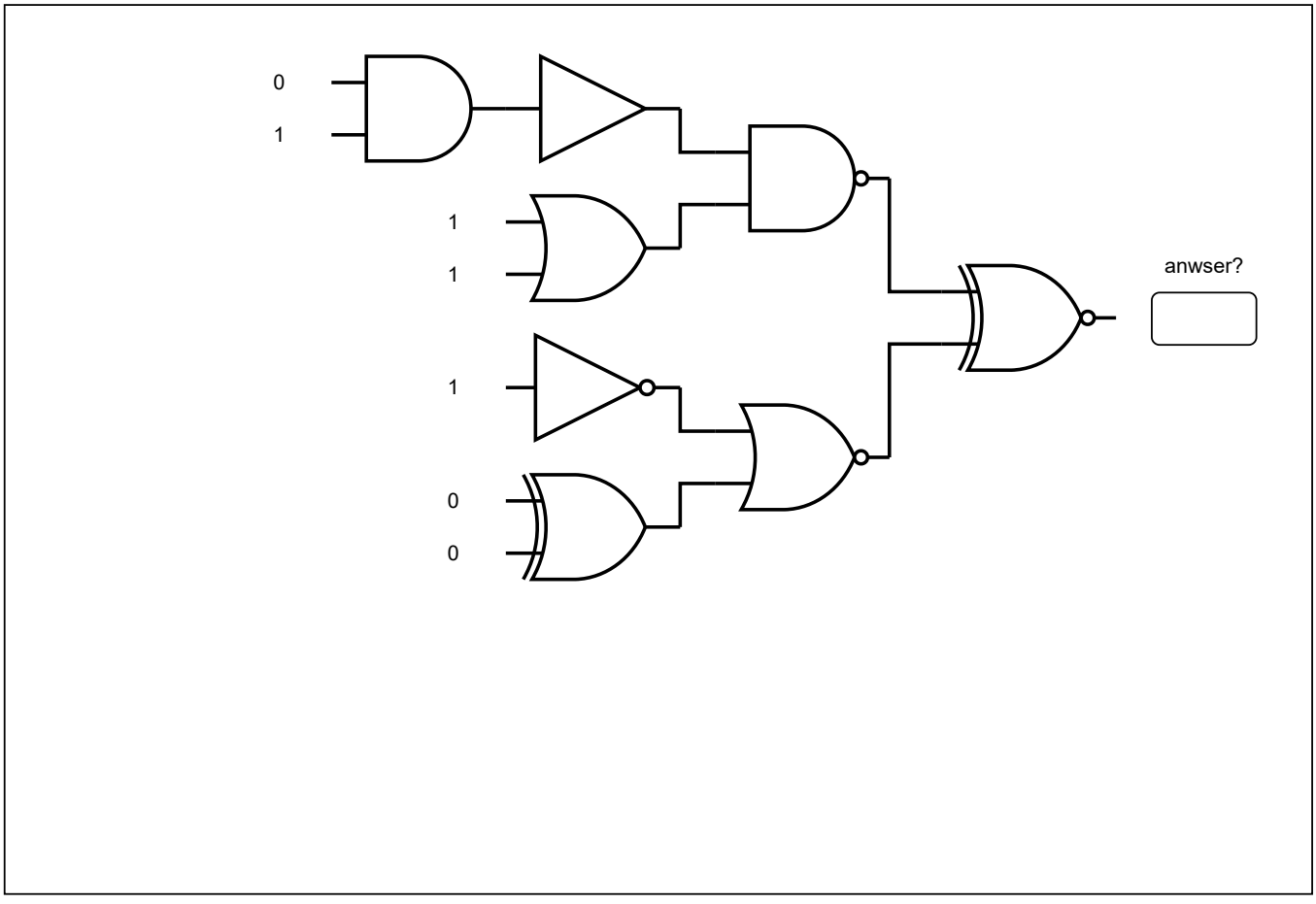


input	output



input	output

my own questions:



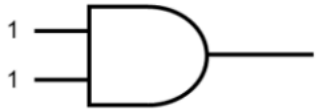
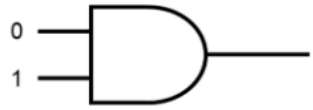
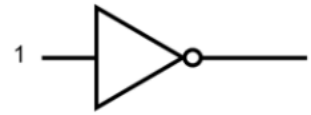
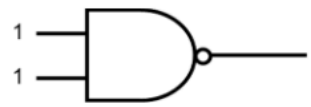
my own questions

Draw an inverter:	Draw an OR gate:	Draw an exlusive NOR:

LC HL 2024

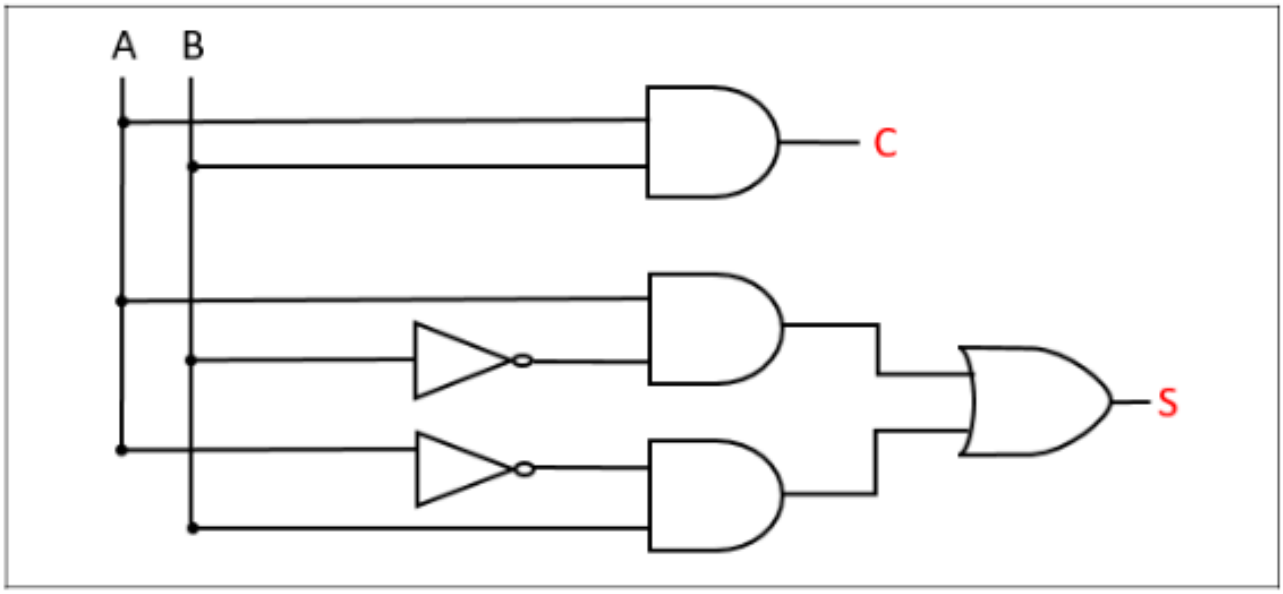
Question 1

Logic gates have one or more inputs and a single output. For each logic gate in Column A in the table below enter the output, either 0 or 1, in Column B.

Column A Logic gate with input(s)	Column B Output (0 or 1)
	
	
	
	
	
	

Question 5

The half-adder logic circuit shown below generates two outputs, S and C, from two inputs, A and B.



(a) What is the value of **C** when the inputs A and B are both 0?

(b) What is the value of **S** when the inputs A and B are both 1?

Question 4

An automatic garage door has three inputs:

- A, the master ON/OFF switch
- B, a sensor on the left hand side
- C, a sensor on the right hand side

Once the master switch has been set ON, either sensor can trigger the door. This scenario can be represented by the logical statement: `A AND (B OR C)`.

(a) Complete the truth table for the logical statement `A AND (B OR C)`.

A	B	C	A AND (B OR C)
0	0	0	0
0	0	1	0
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

(b) Use the relevant gate symbols to draw the circuit diagram for this system.