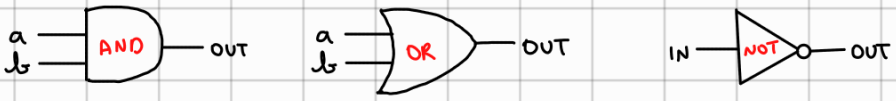
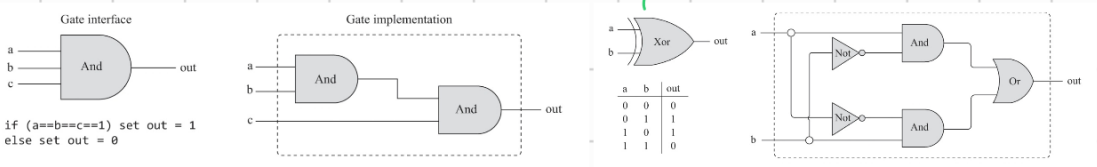
1.1 & 1.2

A BOOLEAN EXPRESSION CAN BE SYNTHESIZED FROM ANY TRUTH TABLE.

A LOGIC GATE IS A PHYSICAL DEVICE THAT IMPLEMENTS A SIMPLE BOOLEAN FUNCTION.



→ INTERFACE (WHAT THE GATE IS SUPPOSED TO DO)



THREE-WAY AND

XOR

↳ IMPLEMENTATION (HOW TO BUILD THE GATE'S FUNCTIONALITY)

1.4 MULTIPLEXER WORKS SIMILARLY TO AN "IF":

IT TAKES TWO INPUT BITS, a AND b, AND INTERPRETS THEM AS DATA BITS.

THE THIRD INPUT BIT, NAMED sel, IS THE SELECTION BIT.

IT OUTPUTS EITHER a OR b.

DEMULTIPLEXER IS THE OPPOSITE:

TAKES A SINGLE INPUT VALUE AND PASSES IT EITHER TO A OR B, DEPENDING ON THE SELECTOR.

MULTI-BIT GATE: AN N-BIT GATE APPLIES THE BOOLEAN OPERATION IT HOLDS TO EVERY ONE OF THE BITS IN ITS N-BIT INPUT.

Ex. 16 BIT NOT GATE:

FOR i = 0...15 OUT[i] = NOT(in[i])

MULTI-WAY GATE:

EX. AN M-WAY OR GATE OUTPUTS 1 WHEN AT LEAST ONE OF ITS M INPUT BITS IS 1, AND 0 OTHERWISE.

1.5 NOT: CAN BE IMPLEMENTED USING A SINGLE NAND

AND: NOT AND NAND

OR: AND AND NOT

XOR AND, NOT, AND OR

1.6 ORDER: