Sep 09

Circuits

Computers → 5V vs. 0V (diff in voltage → CIRCUITS)

→ current on vs. off (→ CIRCUITS)

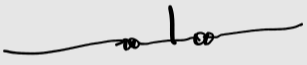
→ TRUE vs. FALSE ↔ LOGIC

→ 1 vs. 0

Switch



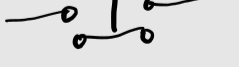
Switch it on



- by default open
- no current
- FALSE
- 0

- now closed
- current can pass
- TRUE
- 1

Other switch



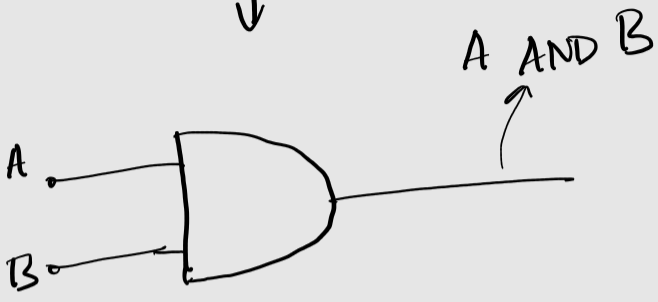
→ by defaut closed.

Consider

→ AND Gate



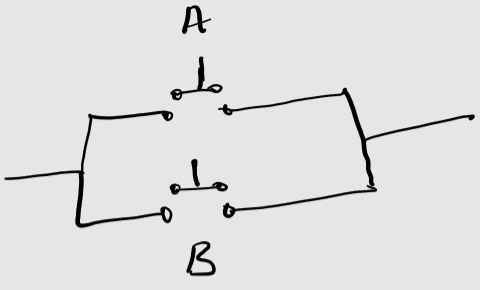




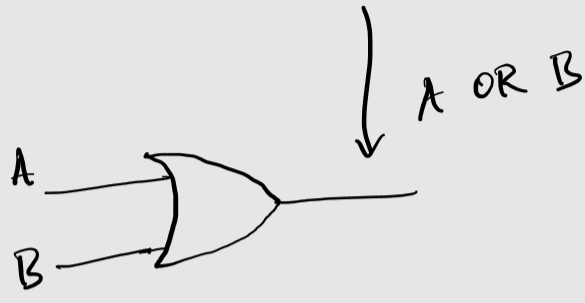
A	B	A AND B
0	0	0
0	1	0
1	0	0
1	1	1

→ Truth table for the AND Gate

Consider as soon as any input is 1, the output is 1



OR Gate



A	B	A OR B
0	0	0
0	1	1
1	0	1
1	1	1

NOT Gate

Truth table



A	NOT A
0	1
1	0

Addition

1 + 1 → 2 but no 2 in circuit world.

1 + 1 → 10 → create a new spot

Solution to no 2 → 1 + 1 = 10 (in binary world)

A	B	A + B
0	0	00
0	1	01
1	0	01
1	1	10

A	B	Carry
0	0	0
0	1	0
1	0	0
1	1	1

→ AND Gate

A	B	Sum
0	0	0
0	1	1
1	0	1
1	1	0

→ XOR Gate

Exclusive-OR gate.



"Adder"

