

# Digital Logic

By  
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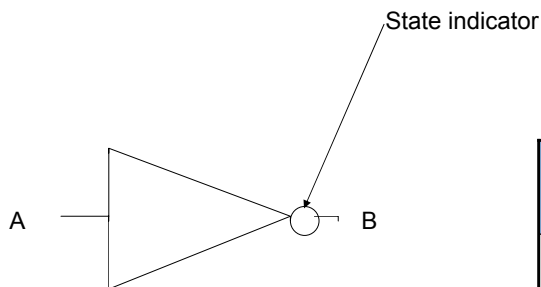
## Basics

- Only two states exists:
  - On/Off
  - True/False
  - Hi/Low
- Voltages represent these states
  - Actual voltage depends on IC power supplies
  - If Powered by +5v referenced to Ground then:
    - Hi,True,On = +5
    - Lo,False,Off = 0V

## Logic Levels

- Since power supplies can vary, the level that constitutes a Hi or Low has a range of valid voltages.
- These differ by the logic “family” they belong to.
  - For TTL, Low=0 to 0.8v, Hi=2 to 5v
  - For CMOS, Low<= 30% of supply voltage, Hi>=70% of supply voltage.

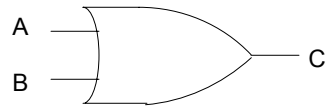
## Inverter



Truth Table

A	B
0	1
1	0

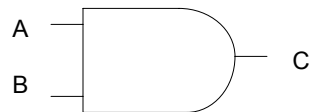
# OR Gate



Truth Table

A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

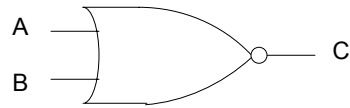
# AND Gate



Truth Table

A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

# NOR Gate



Truth Table

A	B	C
0	0	1
0	1	0
1	0	0
1	1	0

# NAND Gate



Truth Table

A	B	C
0	0	1
0	1	1
1	0	1
1	1	0

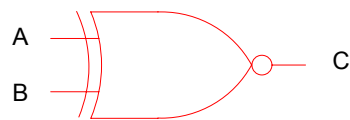
## Exclusive OR Gate



Truth Table

A	B	C
0	0	0
0	1	1
1	0	1
1	1	0

## Exclusive NOR Gate



Truth Table

A	B	C
0	0	1
0	1	0
1	0	0
1	1	1



The End



This is a “logical” place to stop!