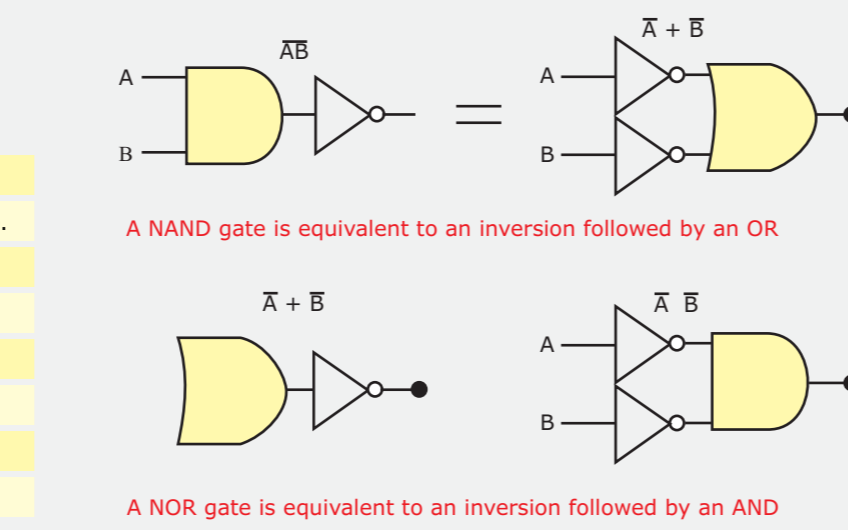
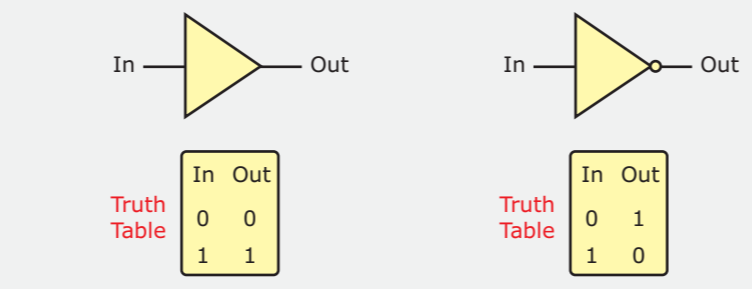
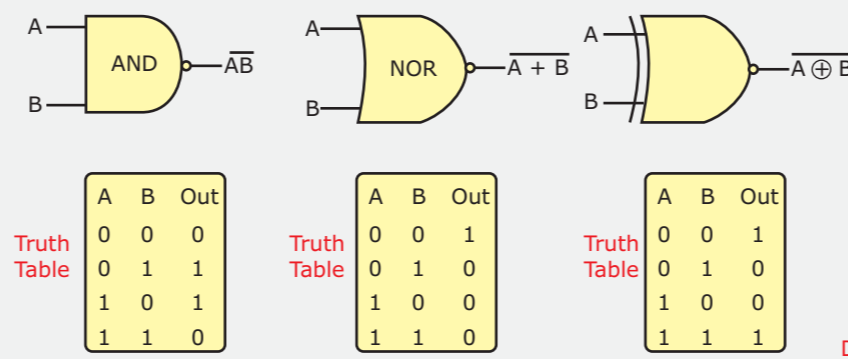
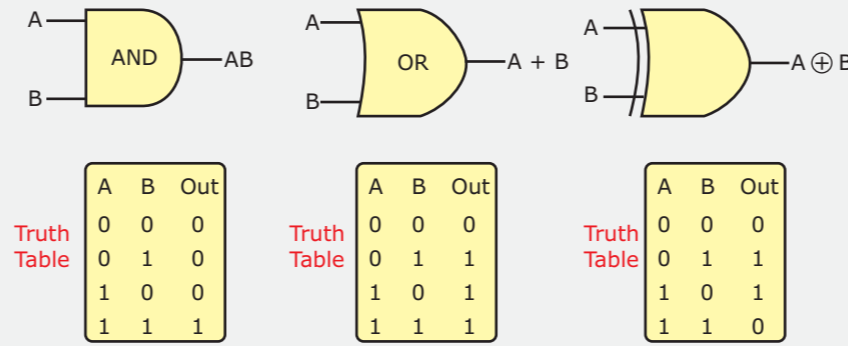


Logic Devices Families

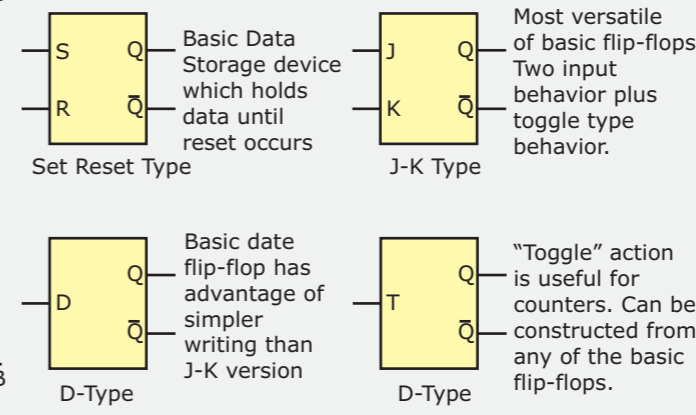
The types of logic devices are classified in "families", of which the most important are TTL and CMOS. The main families are:

- * TTL (Transistor-Transistor Logic), made of bipolar transistors.
- * CMOS (Complementary Metal Oxide Semiconductor) made from MOSFETs
- * ECL (Emitter Coupled Logic) for extremely High speeds.
- * NMOS, PMOS for VLSI large scale integrated circuits.



Binary Function of Two Variables

1.	Null	0
2.	AND	AB
3.	A AND NOT B	AB
4.	NOT A AND B	AB
5.	Exclusive OR	AB+AB
6.	OR	A+B
7.	NOT OR	A+B
8.	Exclusive NOR	AB+AB
9.	Not B	B
10.	A OR NOT B	A + B
11.	NOT A	A
12.	NOT A OR B	A + B
13.	NOT A AND B	AB
14.	IDENTITY	1



Different Bases Conversion Table

Decimal (Base 10)	Octal (base 8)
Binary (Base 2)	Hexadecimal (base 16)

Different Binary Representations of Integers Comparison Table

BDC	Sign Magnitude	
Offset Binary	2's Complement	
Excess 3	4221 Code	Gray Code

Rules of Digital Logic

- $ABC = (AB)C = A(BC)$, $A+B+C = (A+B)+C = A+(B+C)$ AND, OR, are associative
- $AB = BA$, $A + B = B + A$ -----AND and OR operations are commutative.
- $A+BC = (A+B)(A+C)$, $A(B+C) = AB.AC$ -----Forms of the distributive property
- $A+B = \overline{AB}$ -----a form of De-Morgan's Theorem.
- $\overline{AB} = \overline{A} + \overline{B}$ -----a form of De-Morgan's Theorem.
- $AA=A$, $A+A = A$, $A+A = 1$, $AA = 0$, $A = \overline{\overline{A}}$ -----Single Variable Theorems.
- $A+AB = A$, $A+\overline{A}B = A+B$ -----More two-variable Theorems.
- $A1 = A$, $A+1=1$, $A+0 = A$, $A0 = 0$, $1=1$, $0=0$ -----Identity and Null operations.

IC Series Designation

TTL Series	Prefix	CMOS Series	Prefix
Standard TTL	74	Metal-gate CMOS	40 to 140
High-Speed TTL	74H	Metal-gate, pin compatible with TTL	74C
Low-Power TTL	74L	Silicon-gate, pin-compatible with TTL, High-speed	74HC
Schottky TTL	74S	Si gate, high-speed, elect compatible with TTL	74HCT
Low-power Schottky TTL	74LS		
Advanced Schottky TTL	74AS		
Advanced low-power Schottky TTL	74ALS		