Logic

Digital electronics

9/6/2023

1 Binary Codes

Binary Code is how information is represented with binary digits, mulitple exist.Codes provide further implementation methods of binary into a digital system.

Binary Coded Decimal is code to represent decimal in binary. Each digit is represented by its binary 4-bit equivalent.

Application include numeric LED displays. (BCD is translated digit by digit and the appropriate number is shown)

Logic

Logic math (`Boolean Algebra`) existed before digital computers. It explained logic, by the means of math, utilizing 2 values (*True or False*).

- As a transistor is a binary output, logic can be implemented
- Basic functions are `AND, OR, NOT`

- **AND** →All inputs mus tbe true for the expression too be true. $z = xy, z = x * y$
- **OR** →Any 1 input can be true for the expression to be true. $z = x + y$
- **NOT** →Reverse the expression/scoped output from true to false and vice versa. $z = x' = \bar{x}$

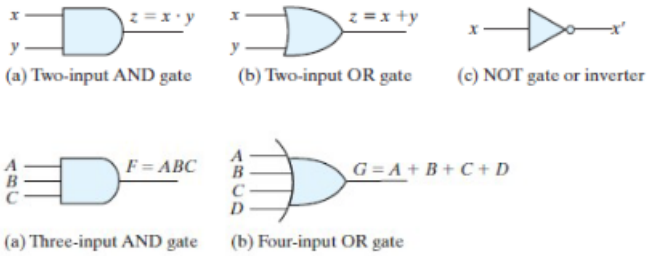
Truth Tables of Logical Operations

AND			OR			NOT	
x	y	$x \cdot y$	x	y	$x + y$	x	x'
0	0	0	0	0	0	0	1
0	1	0	0	1	1	1	0
1	0	0	1	0	1		
1	1	1	1	1	1		

Logic gates

These functions are implemented with logic gates, Electronic device to implement Boolean function.

- These gatees have mulitple inputs and one output.
- They use specific symbols in their schematic representation



Boolean Functions

Varibales are used to represent inputs and outputs. in a Boolean function, ANDs appear as a product and ORs appear as a sum. NOT is represented with a ‘ or a bar above the variable.