CA FUNSTA
UNBOX THE NEW WAY OF LEARNING

Computer Awareness

Part 6

- Funsta Team

Lets Start

Computer Awareness

Part 1 Intro/Generation/ Classification of Computers

Part 2 Computer Architecture & Memory

Part 3 Computer Hardware

Part 4 Computer Software and System Utilities

Part 5 Number System

Lets move on to
Next Part

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Computer Codes

Computer Codes

Extended Binary Coded Decimal Interchange Code (EBCDIC)

Binary Coded Decimal (BCD)

American Standard Code for Information Interchange (ASCII)

Unicode

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Binary Coded Decimal (BCD)

- Binary coded Decimal is a way to store decimal numbers in binary
- This number representation uses 4 bits to store each digit from 0 to 9.
- E.g. 199910 = 0001 1001 1001 1001
- BCD is often used in business applications and calculators
- This can handle 2^6 = 64 characters only.
- BCD is developed by IBM corporation

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American Standard Code for Information Interchange (ASCII)

- This characters are represented by 7 bits
- This can handle 2^7 bit which means 128 characters.
- The new edition ASCII -8, has 2^8 bits and can handle 256 characters are represented from 0 to 255 unique numbers.
- Out of this 33 are non-printing, mostly obsolete control characters that affect how text is processed
- 95 are printable characters
- Example: An uppercase “A” is represented by the decimal number 65

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Extended Binary Coded Decimal Interchange Code (EBCDIC)

- This is similar to ASCII Code with 8 bit representation.
- This coding system is formulated by International Business Machine(IBM).
- The coding system can handle 256 characters.

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Unicode

- Unicode is a universal character encoding standard.
- It defines the way individual characters are represented in text files, web pages, and other types of documents.
- This is 16 bit code and can handle 65536 characters
- Unicode scheme is denoted by hexadecimal numbers.

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Logic Gates

RECAP

- Logic gates are the basic building blocks of any digital system.
- It is an electronic circuit having one or more than one input and only one output.
- The relationship between the input and the output is based on a **Certain Logic**.
- Based on this, logic gates are named as AND gate, OR gate, NOT gate etc.
- Types of Logic Gates

- Inverter or NOT Gate
- AND Gate
- NAND Gate
- OR Gate
- NOR Gate
- Exclusive OR or XOR Gate
- Exclusive NOR or XNOR Gate

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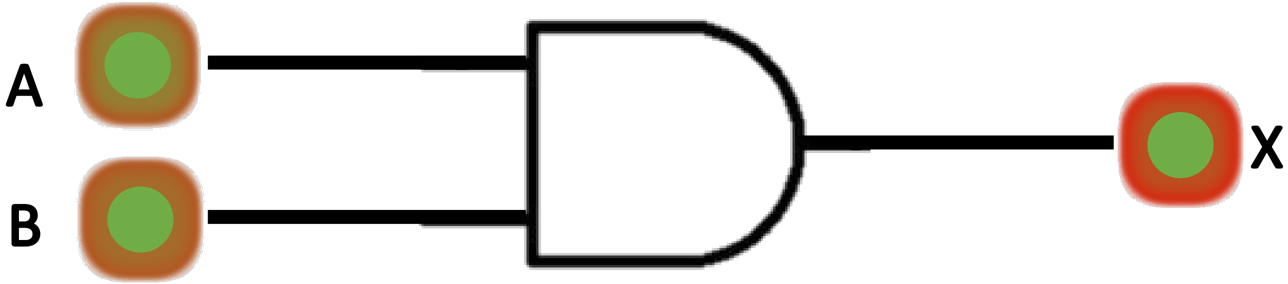
AND Gate

- The AND operator is defined in Boolean algebra by the use of the dot (.) operator.
- It is similar to multiplication in ordinary algebra.
- The AND operator combines two or more input variables so that the output is true only if all the inputs are true
- AND operation is expressed as: $X = A . B$

A	B	X
0	0	0
0	1	0
1	0	0
1	1	1



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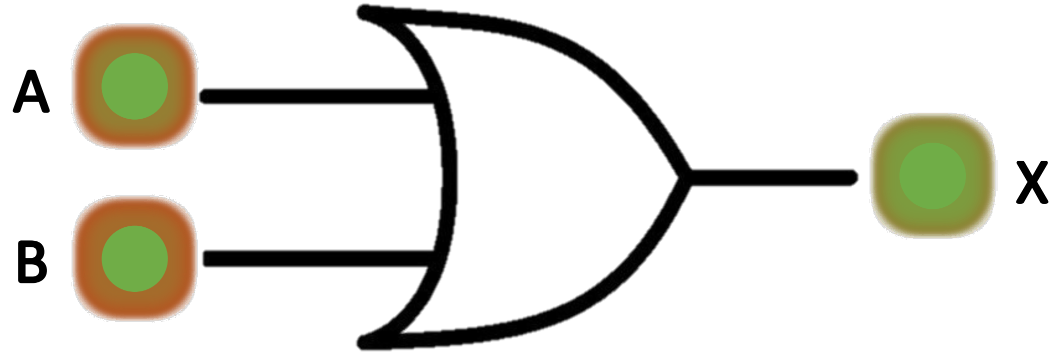
OR Gate

- The plus sign is used to indicate the OR operator.
- The OR operator combines two or more input variables so that the output is true if at least one input is true.
- OR operation is expressed as: X = A + B

A	B	X
0	0	0
0	1	1
1	0	1
1	1	1



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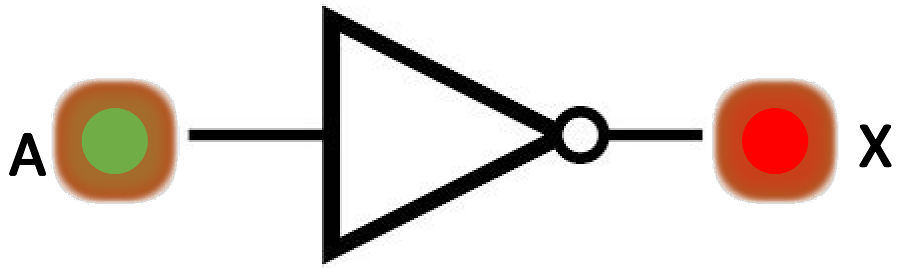
Inverter or NOT Gate

- The NOT operator has one input and one output.
- The input is either true or false, and the output is always the opposite, that is, the NOT operator inverts the input
- The NOT operator is represented algebraically by the Boolean expression: $X = \overline{A}$ or A’



A	X=A’
0	1
1	0

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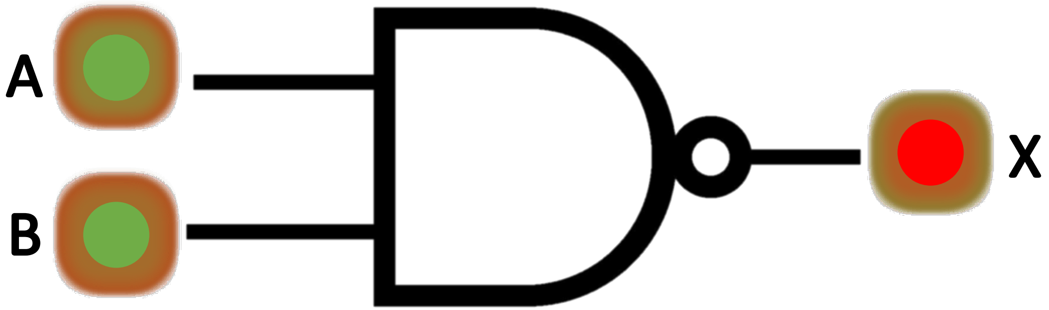
NAND Gate

- It is also called Universal Gates.
- The NAND is the combination of NOT and AND.
- The NAND is generated by inverting the output of an AND operator.
- The algebraic expression of the NAND function is:,$X = \overline{(A . B)} = \overline{A} + \overline{B}$

A	B	X
0	0	1
0	1	1
1	0	1
1	1	0



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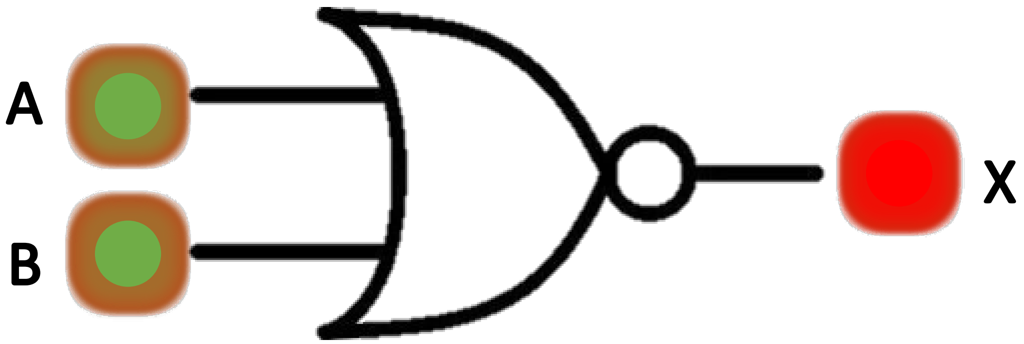
NOR Gate

- It is also called Universal Gates.
- The NOR is the combination of NOT and OR.
- The NOR is generated by inverting the output of an OR operator
- The algebraic expression of the NOR function is: $X = \overline{A + B} = \overline{A} \, . \, \overline{B}$

A	B	X
0	0	1
0	1	0
1	0	0
1	1	0



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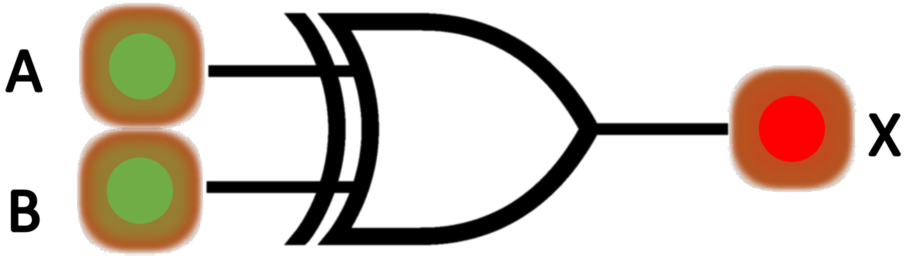
Exclusive OR or XOR Gate

- The XOR (exclusive - OR) gate acts in the same way as the logical "either/or."
- The output is "true" if either, but not both, of the inputs are "true". The output is "false"
- If both inputs are "false" or if both inputs are "true".
- The algebraic expression of the NOR function is: $X = A \oplus B = \overline{A}B + A\overline{B}$

A	B	X
0	0	0
0	1	1
1	0	1
1	1	0



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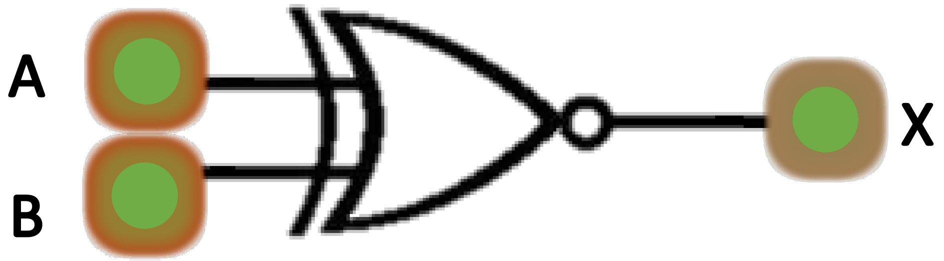
Exclusive NOR or XNOR Gate

- The XNOR (exclusive - NOR) gate is a combination XOR gate followed by an inverter.
- Its output is "true" if the inputs are the same, and "false" if the inputs are different.
- In simple words, the output is 1 if the input are the same, otherwise the output is 0.
- The algebraic expression of the XNOR function is: $X = \overline{A \oplus B}$

  $= AB + \bar{A}\bar{B}$

A	B	X
0	0	1
0	1	0
1	0	0
1	1	1



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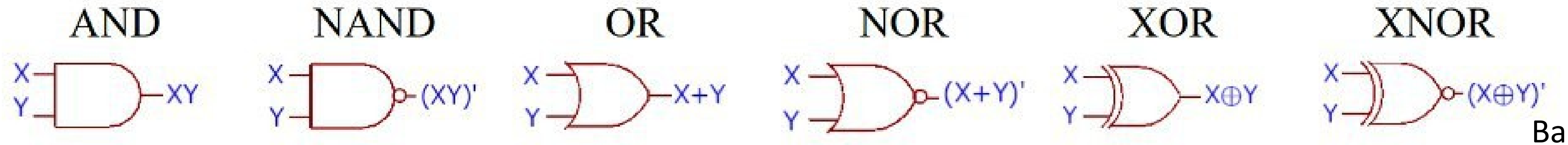
Recap Session

Complete the truth table below for the AND, NAND, OR, NOR, XOR, and XNOR functions.

X	Y	X•Y	(X•Y)'	X+Y	(X+Y)'	X ⊕ Y	(X ⊕ Y)'
0	0						
0	1						
1	0						
1	1						

The logic gates for these functions are shown below:



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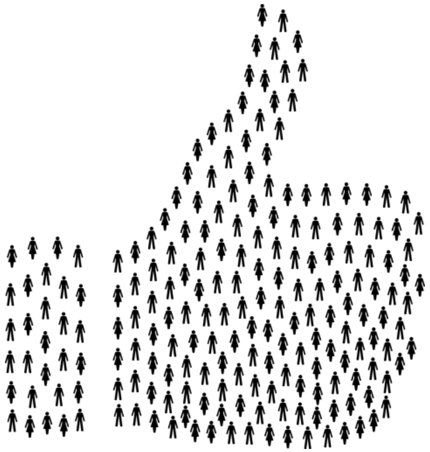
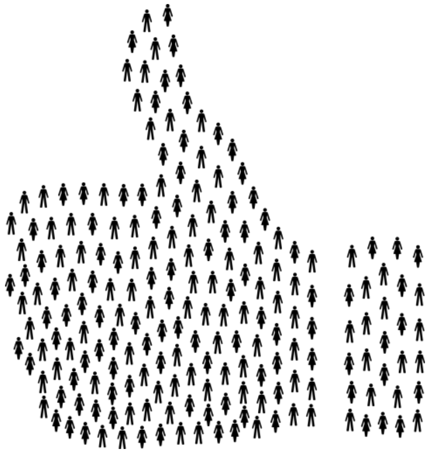
'Hurrah!'
We completed this section.



Next Section

Coming Soon...



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