

Bases

0x0F > 0000 1111
 Convert by each byte for bitstrings.
 1100 + 11 =
 1100 + 0011
 Pad from the left.
 0x0F + 0x0A
 15 + 10 = 25
REMEMBER TO CONVERT BASES BACK UNLESS STATED OTHERWISE

Logic

p	implies	q
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0	0	1
---	---	---

0	1	1
---	---	---

1	0	0
---	---	---

1	1	1
---	---	---

p	or	q
---	----	---

0	0	0
---	---	---

0	1	1
---	---	---

1	0	1
---	---	---

1	1	1
---	---	---

p	and	q
---	-----	---

0	0	0
---	---	---

0	1	0
---	---	---

1	0	0
---	---	---

1	1	1
---	---	---

Sets

Sets have no duplicates, and are unordered.
 set('john, stop')
 = {'j', 'o', 'h', 'n', ',', 's', 't', 'o', 'p'}
 commas and spaces count as characters
 A = {j, o, h, n}, B = {s, t, o, p}
 $A \cup B = \{j, o, h, n, s, t, o, p\}$
 $A \cap B = \{o\}$
 $A - B = \{j, h, n\}$
 $\text{Symdiff} = A \cup B - A \cap B = \{j, h, n, s, t, p\}$
 = XOR

Graphs

For $(v, w) \in E \Rightarrow (w, v) \in E$ to be true...

It must be an undirected graph.
 (v, w) is an edge in the set of all edges E

Trees are graphs but cannot have cycles.

Edge list: (NODE, COST, NODE)

Big O

Most Efficient
 $O(1)$
 $O(\log n)$
 $O(n)$
 $O(n \log n)$
 $O(n^2)$
 $O(n!)$
 Least Efficient
 logn is hopping halfway between

Functions

Domain = Source/Left
 Range = Result/Right
 A relation can be thought of as a set that contains every pair which maps from an element in the domain to an element in the range.
 For a function, every element in the range is mapped to from a unique element in the domain. This is to say, that an element on the left of this diagram can ONLY map to ONE element on the right.

Matrices

$1 \times 2 \ 2 \times 1$
 $[5, 7] [3]$
 [4]
 If the two inside numbers are the same, dot product can be performed, the resulting matrix is the rows x column

Relations

Domain/Range is the same
RELATIONS CAN MAP MULTIPLE DOMAIN ELEMENTS TO A RANGE ELEMENT
 Transitive
 Triangle line.
 I'm taller than Pramod, who is taller than Alex, therefore, I'm taller than Alex.
 $x > y, y > z \Rightarrow x > z$
 Reflexive
 Diagonal line
 I know myself
 $x = x$
 Symmetric
 Diagonal with identical results mirrored.
 They're sitting across from me, therefore I'm sitting across from them.
 $x + y / 2 = y \Rightarrow x = y$

