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
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 ∪ B = {j, o, h, n, s, t , o, p}
A ∩ B = {o}
A - B = {j, h, n}
Symdiff = A ∪ B - A ∩ B =
{j, h, n, s, t, p}
= XOR

Graphs

For (v, w) ∈ E => (w, v) ∈ 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(logn)
O(n)
O(nlogn)
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 x 2 2 x 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 => 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 => x=y