

A		Arrays; N-dimensional arrays; Stacks; Queues
1	1	Maximum value of an array without using loops
2	2	Display the numbers from 1 to 100 without using loops/conditionals
3	3	Find the greatest area formed by rectangles of 1's in a binary matrix
4	4	Find groups of 1's in an MxN matrix
5	5	Rotate a matrix of numbers by 90 deg
6	6	Merge two sorted arrays where one has enough space at the end for the other
7	7	Given an MxN matrix, if any element is zero, make that column and row all zeroes.
8	8	Given two arrays of single-digit numbers, create a function that will add them and produce the result in the same format as the inputs. Example: a = [9,9], b=[1] so o = [1,0,0]
9	9	Given an array with values ranging from 0 to n-1, swap each array location with the value on the nth position with a[a[n]]
10	10	Shuffle an array
11	11	Write a function that will reverse N sized blocks of an array.
12	12	Implement a circular queue
13	13	Flatten an array, Recursive and iterative implementation
14	14	Given the start and end position of an NxM matrix, find all possible routes from start to end given the only valid movements of right or down.
15	15	Given an MxN matrix that is in ascending order both on rows and columns, create a search function.
16	16	Given an array of numbers of length N, find the index of that array that balances the left and right sum.
17	17	Optimize space through triangular arrays
18	18	Optimize storing a sparse matrix
19	19	Determine if a series of parenthesis are balanced, and if not, how many parenthesis are missing at the first instance of an error
20	20	Check if an expression consisting of parenthesis, square brackets and curly brackets is balanced.
21	21	<p>Given a set of N cars that travel at the same speed but may be traveling in opposite direction, write a function that will determine the number of times cars will pass each other.</p> <pre> ----- c-> c-> c-> c-> <-c <-c <-c <-c c-> ----- 7 times </pre>
22	22	<p>There is a set of N fish that are of varying sizes (no two are alike) and travel in one of two possible directions. Initially all fish are alive. When the fish meet each other, the larger fish will eat the smaller fish. Determine how many fish will be alive at the end of any given arrangement.</p> <p>example:</p> <pre> ----- <-2 6-> 1-> <-7 <-5 4-> <-3 ----- </pre> <p>4 fish remain</p>
23	23	Convert a base 10 number to any other base by making use of stacks
24	24	Implement a hot-potato simulation using queues.
B		Strings
25	1	
26	2	Find the distance between two strings (Levenshtein)
27	3	Finding anagrams
28	4	Determine if a string is a rotation of another
29	5	Determine if a string is a permutation of another.
30	6	Reversing the odd positioned words of a string
C		Linked Lists
31	1	Find the middle node of a single linked list.
32	2	Find the node at the beginning of a loop in a singly linked list
33	3	Find the k-th to last node of a singly linked list.
34	4	Implement merge sort for linked lists
35	5	Given a single linked list as input, Determine if the contents is a palindrome.
36	6	Reverse a Linked List

37	7	Implement a priority queue with a linked list
D	Search/Sort	
38	1	Given a random set of letters, find the longest word that can be formed
39	2	Find the 2nd largest number
40	3	Find the 2nd largest number in a stream.
41	4	Find the Kth largest numbers in an unsorted list.
42	5	Given a set of numbers of size N-1 whose values range from 1 to N, finding the missing number
43	6	Longest Common Subsequence (LCS)
44	7	Given a string of lowercase letters, find a string that contains all unique characters and has the lowest lexicographic value possible
45	8	Find the consecutive sequence of numbers that sums up to a target number
46	9	Find the largest run of at most two distinct numbers ex: Input: "1212223311212223" Output: "1121222" Input: "111" Output: "111"
47	10	Find the majority number in an array
48	11	Find the smallest substring in S that contains all the characters in the string T. T is a string of unique characters.
49	12	ICPC 2007 Problem A - Consanguine Calculations
50	13	Given A, B, and C as inputs, determine if C can be formed by an interleaved combination of the characters of A and B. Example: A = "abcd" B = "abcd" C = "aabcbbcd"
E	Trees	
51	1	Lowest Common Ancestor (LCA)
52	2	Given a binary tree, print out the nodes in order of top-to-bottom, and left-to-right
53	3	Given the root of a tree, write a function that takes two numbers (n1 and n2). Search for these two numbers within the tree and indicate if they are found at the same depth.
54	4	Given a dictionary input, output a trie structure representing the dictionary.
55	5	Determine if a tree is mirrored
56	6	Given an input stream, detect when the series of characters correspond to a word found in a word array.
57	7	Implement insert and delete operations on an BST
58	8	Implement searching in an AVL tree
59	9	Implement the rebalancing algorithm for an AVL tree
60	10	Create a priority queue using the heap tree structure
61	11	Sweep line algorithm. Find the intersections of horizontal and vertical lines
F	Graphs	
62	1	Topological Sort (DAG-algorithm)
63	2	Find the inner-most cycles in a graph
64	3	Represent a graph in an adjacency matrix and as a list of nodes
65	4	Implement shortest path algorithm for unweighted graphs. BFS approach
66	5	AMC ICPC 2017 - problem I: Chamber of Secrets
G	Bit manipulation	
67	1	Find the numbers that are repeated an odd number of times in an array.
68	2	Given x, find y that is min x-y , y has the same number of set bits as x and y!=x
69	3	Find the number of different bits between two numbers

	H	HTML/CSS challenges
70	1	CSS challenge: Checked button
71	2	CSS Geometry problem. Trapezoid picture
72	3	CSS Geometry problem. Two circles
73	4	Trace the path of a star (hypotrochoid)
74	5	Make a ball follow an elliptical orbit
75	6	Create a bouncing ball animation
	I	Mathematics/Logic/Patterns
76	1	Einstein's riddle
77	2	Logic problem from www.printable-puzzles.com ID: U357WZ
78	3	Generate the next numbers in the series 1, 2, 4, 5, 8, 10, 16,...
79	4	Find the next elements in the series 1, 2, 6,15, 31, 56, ...
80	5	Find the nth element in the series: 3, 5, 6, 9, 10, 12, 17, 18, 20, 24, ... (two bit series)
81	6	Find the numbers whose digits sum 5 from 1 to 200
82	7	<p>"Given an infinit series as input, an array of increasing numbers (e.g. [2,3,5]), find out if a number N survives the cutting off of the series</p> <p>Example: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,...</p> <p>Remove every 2 1,3,5,7,9,11,13,15,17,19,21</p> <p>Remove ever 3 1,3,7,9,13,15,19,21</p> <p>Remove every 5 1,3,7,9,15,19,21,...</p> <p>does N survive?"</p>
83	8	Find Prime numbers in a range
84	9	Find first N prime numbers
85	10	Get prime factors of a given number.
86	11	Find the largest possible number that can be formed with an input array of N digits that is also divisible by 3
87	12	ICPC 2015 Problem D - Dividing a block of cheese
88	13	<p>Given a number that can be divided into at least two other integer numbers (eg: $10 = 5+2+2+1$), find the targets value that can be obtained from multiplying its parts.</p> <p>Example: $2 = 1 * 1 = 1$ $7 = 3 * 4 = 12$</p>
89	14	Given a range of natural numbers from 0 to N, determine the number of 2s that are found in the digits of each of those numbers
90	15	Convert a number to its text representation
91	16	Write an algorithm that will transform arabic numerals to roman, and from roman to arabic as well.

92	17	<p>Decrypt chunks of text that use a substitution cypher</p> <p>qgeixed ylv bszly teszxdvixp ylvev xaxu dspaxmvdugy ylgr ylv pgbdsve nuviapgavuv lxd tbrudvevd ylvsepugy ygaxnv evhbmylvsep ugy ygevxpgu ilm ylvsep tryyg dg xud dsvsuyg ylv cxbvmgq dvxyl egdvylv psfrudevdxuugu ygeszly gq ylva wxuuguyg bvqygq ylvawxuugu suqeguy gqylva cgbbvmvd xud ylrudvevdpygeavd xy isyl plgyxud plvbbtgdbdm ylv m egdv xudivbbsuygylv oxip gqdvxylsuyg ylv agryl gq lvbbegdv ylvpsf lrudevd qbxplvdxbb ylvse pxtvep txevqbxplvd xp ylv m yreuvd su xsepstesuz ylv zruuvep ylvevwixezsuz xuxeam ilsbvxb ylvigebd igudvevdhbruzvdsu ylv txyvem pagnveszlyylegr ylv bsuv ylv m tegnvwgppxwn xuderppsuevvbvd qegaylv pxtvev pyegnvlpxyyevd xudprudvevdylvu ylv megdv txwn tryugyugy ylvpsf lrudevd</p> <p>lrmnir bpr sumvbwvr jx bpr lmiwv yjerykbi jx qmbm wi bpr xjvni mkd ymibrut jx irhx wi bpr riirkvr jx ymbinlmtmipw utn qmumbr dj w ipmhh but bj rhnvwdmbr bpr yjerykbi jx bpr qmbm mvvjudwko bj yt wkbrusurbmbwjk lmird jk xjibt trmui jx ibndt wb wi kjb mk rmit bmiq bj rashmwk rmvp yjerykb mkd wbi iwokwxwvmkvr mkd ijyr ynib urymwk nkrashmwkrd bj ower m vjyshrbr rashmkmbwjk jkr cjnhd pmer bj lr fnmhwxwrd mkd wkiswurd bj invp mk rabrkb bpmb pr vjnhd urmvp bpr ibmbr jx rkhwoibrkrd ywkd vmsmlhr jx urvjokwgwko ijnkdhrri ijnkd mkd ipmsrhrii ipmsr w dj kjb dry ytirhx bpr xwkmh mnbpjuwbt lnb yt rasruwrkvr cwbp qmbm pmi hrxb kj djnlb bpmb bpr xjhhjcwko wi bpr sujsru msshwvmbwjk mkd wkbrusurbmbwjk w jxxru yt bprjuwri wk bpr pjsr bpmb bpr riirkvr jx jqwkmcmk qmumbr cwhh urymwk wkbmvb</p>
93	18	<p>Translate from one unknown language to another (Centauri/Arcturon)</p> <p>farok crrrok hihok yorok klok kantok ok-yurp</p> <p>farok - jjat crrrok - hihok - arrat yorok - mat klok - bat kantok - oloat ok-yurp - at-yurp</p> <p>lalok - wat</p> <p>1a. ok-voon ororok sprok . 1b. at-voon bichat dat .</p> <p>2a. ok-drubel ok-voon anak plok sprok . 2b. at-drubel at-voon pippat rrat dat .</p> <p>3a. erok sprok izok hihok ghiron . 3b. totat dat arrat vat hilat .</p> <p>4a. ok-voon anak drok brok jok . 4b. at-voon krat pippat sat lat .</p> <p>5a. wiwok farok izok stok . 5b. totat jjat quat cat .</p> <p>6a. lalok sprok izok jok stok . 6b. wat dat krat quat cat .</p> <p>7a. lalok farok ororok lalok sprok izok enemok . 7b. wat jjat bichat wat dat vat eneat .</p> <p>8a. lalok brok anak plok nok . 8b. iat lat pippat rrat nnat .</p> <p>9a. wiwok nok izok kantok ok-yurp . 9b. totat nnat quat oloat at-yurp .</p> <p>10a. lalok mok nok yorok ghiron klok . 10b. wat nnat gat mat bat hilat .</p> <p>11a. lalok nok crrrok hihok yorok zanzanak . 11b. wat nnat arrat mat zanzanat .</p> <p>12a. lalok rarok nok izok hihok mok . 12b. wat nnat forat arrat vat gat .</p>