Arrays

1. Given an array A[] and a number x, check for pair in A[] with sum as x
2. Majority Element
3. Find the Number Occurring Odd Number of Times
4. Largest Sum Contiguous Subarray
5. Find the Missing Number
6. Search an element in a sorted and pivoted array
7. Merge an array of size n into another array of size m+n
8. Median of two sorted arrays
9. Write a program to reverse an array
10. Program for array rotation
11. Reversal algorithm for array rotation
12. Block swap algorithm for array rotation
13. Maximum sum such that no two elements are adjacent
14. Leaders in an array
15. Sort elements by frequency | Set 1
16. Count Inversions in an array
17. Count Inversions in an array-using merge
18. Two elements whose sum is closest to zero
19. Find the smallest and second smallest element in an array
20. Check for Majority Element in a sorted array
21. Maximum and minimum of an array using minimum number of comparisons
22. Segregate 0s and 1s in an array
23. k largest(or smallest) elements in an array | added Min Heap method(using sorting)
24. Maximum difference between two elements
25. Union and Intersection of two sorted arrays
26. Floor and Ceiling in a sorted array
27. A Product Array Puzzle
28. Segregate Even and Odd numbers
29. Find the two repeating elements in a given array
30. Sort an array of 0s, 1s and 2s // try using dutch national flag algorithm
31. Find the Minimum length Unsorted Subarray, sorting which makes the complete array sorted
32. Find duplicates in O(n) time and O(1) extra space
33. Equilibrium index of an array
34. Linked List vs Array
35. Which sorting algorithm makes minimum number of memory writes?
36. Turn an image by 90 degree
37. Next Greater Element
38. Check if array elements are consecutive | Added Method 3
39. Find the smallest missing number
40. Count the number of occurrences in a sorted array
41. Interpolation search vs Binary search
42. Given an array arr[], find the maximum j – i such that arr[j] > arr[i]
43. Maximum of all subarrays of size k (Added a O(n) method)
44. Find whether an array is subset of another array | Added Method 3
45. Find the minimum distance between two numbers
46. Find the repeating and the missing | Added 3 new methods
47. Median in a stream of integers (running integers)
48. Find a Fixed Point in a given array
49. Maximum Length Bitonic Subarray
50. Find the maximum element in an array which is first increasing and then decreasing
51. Count smaller elements on right side
52. Minimum number of jumps to reach end
53. Implement two stacks in an array
54. Find subarray with given sum
55. Dynamic Programming | Set 14 (Maximum Sum Increasing Subsequence)
56. Longest Monotonically Increasing Subsequence Size (N log N)
57. Find a triplet that sum to a given value
58. Find the smallest positive number missing from an unsorted array
59. Find the two numbers with odd occurrences in an unsorted array
60. The Celebrity Problem
61. Dynamic Programming | Set 15 (Longest Bitonic Subsequence)
62. Find a sorted subsequence of size 3 in linear time
63. Largest subarray with equal number of 0s and 1s
64. Dynamic Programming | Set 18 (Partition problem)
65. Maximum Product Subarray
66. Find a pair with the given difference
67. Replace every element with the next greatest
68. Dynamic Programming | Set 20 (Maximum Length Chain of Pairs)
69. Find four elements that sum to a given value | Set 1 (n^3 solution)
70. Find four elements that sum to a given value | Set 2 ( O(n^2Logn) Solution)
71. Sort a nearly sorted (or K sorted) array
72. Maximum circular subarray sum
73. Find the row with maximum number of 1s
74. Median of two sorted arrays of different sizes
75. Shuffle a given array
76. Count the number of possible triangles
77. Iterative Quick Sort
78. Find the number of islands
79. Construction of Longest Monotonically Increasing Subsequence (N log N)
80. Find the first circular tour that visits all petrol pumps
81. Arrange given numbers to form the biggest number
82. Pancake sorting
83. A Pancake Sorting Problem
84. Tug of War
85. Divide and Conquer | Set 3 (Maximum Subarray Sum)
86. Counting Sort
87. Merge Overlapping Intervals
88. Find the maximum repeating number in O(n) time and O(1) extra space
89. Stock Buy Sell to Maximize Profit
90. Rearrange positive and negative numbers in O(n) time and O(1) extra space
91. Sort elements by frequency | Set 2
92. Find a peak element
93. Print all possible combinations of r elements in a given array of size n
94. Given an array of of size n and a number k, find all elements that appear more than n/k times
95. Find the point where a monotonically increasing function becomes positive first time
96. Find the Increasing subsequence of length three with maximum product
97. Find the minimum element in a sorted and rotated array
98. Stable Marriage Problem
99. Merge k sorted arrays | Set 1
100. Radix Sort
101. Move all zeroes to end of array
102. Find number of pairs such that x^y > y^x
103. Count all distinct pairs with difference equal to k
104. Find if there is a subarray with 0 sum
105. Smallest subarray with sum greater than a given value
106. Sort an array according to the order defined by another array
107. Maximum Sum Path in Two Arrays
108. Sort an array in wave form
109. K’th Smallest/Largest Element in Unsorted Array
110. K’th Smallest/Largest Element in Unsorted Array in Expected Linear Time
111. K’th Smallest/Largest Element in Unsorted Array in Worst Case Linear Time
112. Find Index of 0 to be replaced with 1 to get longest continuous sequence of 1s in a binary array
113. Find the closest pair from two sorted arrays
114. Given a sorted array and a number x, find the pair in array whose sum is closest to x
115. Count 1’s in a sorted binary array
116. Print All Distinct Elements of a given integer array
117. Construct an array from its pair-sum array
118. Find common elements in three sorted arrays
119. Find the first repeating element in an array of integers
120. Find the smallest positive integer value that cannot be represented as sum of any subset of a given array
121. Rearrange an array such that ‘arr[j]’ becomes ‘i’ if ‘arr[i]’ is ‘j’
122. Find position of an element in a sorted array of infinite numbers
123. Can QuickSort be implemented in O(nLogn) worst case time complexity?
124. Check if a given array contains duplicate elements within k distance from each other
125. Find the element that appears once
126. Replace every array element by multiplication of previous and next
127. Check if any two intervals overlap among a given set of intervals
128. Delete an element from array (Using two traversals and one traversal)
129. Find the largest pair sum in an unsorted array
130. Online algorithm for checking palindrome in a stream
131. Pythagorean Triplet in an array
132. Maximum profit by buying and selling a share at most twice
133. Find Union and Intersection of two unsorted Arrays
134. Count frequencies of all elements in array in O(1) extra space and O(n) time
135. Generate all possible sorted arrays from alternate elements of two given sorted arrays
136. Minimum number of swaps required for arranging pairs adjacent to each other
137. Trapping Rain Water
138. Convert array into Zig-Zag fashion
139. Find maximum average subarray of k length
140. Find maximum value of Sum( i\*arr[i]) with only rotations on given array allowed
141. Reorder an array according to given indexes
142. Find zeroes to be flipped so that number of consecutive 1’s is maximized
143. Count triplets with sum smaller than a given value
144. Find the subarray with least average
145. Count Inversions of size three in a give array
146. Longest Span with same Sum in two Binary arrays
147. Merge two sorted arrays with O(1) extra space
148. Form minimum number from given sequence
149. Subarray/Substring vs Subsequence and Programs to Generate them
150. Count Strictly Increasing Subarrays
151. Rearrange an array in maximum minimum form
152. Find minimum difference between any two elements
153. Find lost element from a duplicated array
154. Count pairs with given sum
155. Count minimum steps to get the given desired array
156. Find minimum number of merge operations to make an array palindrome
157. Minimize the maximum difference between the heights

Singly Linked List:

1. Introduction to Linked List
2. Linked List vs Array
3. Linked List Insertion
4. Linked List Deletion (Deleting a given key)
5. Linked List Deletion (Deleting a key at given position)
6. A Programmer’s approach of looking at Array vs. Linked List
7. Find Length of a Linked List (Iterative and Recursive)
8. Search an element in a Linked List (Iterative and Recursive)
9. How to write C functions that modify head pointer of a Linked List?
10. Swap nodes in a linked list without swapping data
11. Write a function to get Nth node in a Linked List
12. Print the middle of a given linked list
13. Nth node from the end of a Linked List
14. Write a function to delete a Linked List
15. Write a function that counts the number of times a given int occurs in a Linked List
16. Reverse a linked list
17. Detect loop in a linked list
18. Merge two sorted linked lists
19. Generic Linked List in C
20. Given a linked list which is sorted, how will you insert in sorted way
21. Given only a pointer to a node to be deleted in a singly linked list, how do you delete it?
22. Function to check if a singly linked list is palindrome
23. Intersection point of two Linked Lists.
24. Recursive function to print reverse of a Linked List
25. Remove duplicates from a sorted linked list
26. Remove duplicates from an unsorted linked list
27. Pairwise swap elements of a given linked list
28. Practice questions for Linked List and Recursion
29. Move last element to front of a given Linked List
30. Intersection of two Sorted Linked Lists
31. Delete alternate nodes of a Linked List
32. Alternating split of a given Singly Linked List
33. Identical Linked Lists
34. Merge Sort for Linked Lists
35. Reverse a Linked List in groups of given size
36. Reverse alternate K nodes in a Singly Linked List
37. Delete nodes which have a greater value on right side
38. Segregate even and odd nodes in a Linked List
39. Detect and Remove Loop in a Linked List
40. Add two numbers represented by linked lists | Set 1
41. Delete a given node in Linked List under given constraints
42. Union and Intersection of two Linked Lists
43. Find a triplet from three linked lists with sum equal to a given number
44. Rotate a Linked List
45. Flattening a Linked List
46. Add two numbers represented by linked lists | Set 2
47. Sort a linked list of 0s, 1s and 2s
48. Flatten a multilevel linked list
49. Delete N nodes after M nodes of a linked list
50. QuickSort on Singly Linked List
51. Merge a linked list into another linked list at alternate positions
52. Pairwise swap elements of a given linked list by changing links
53. Given a linked list of line segments, remove middle points
54. Construct a Maximum Sum Linked List out of two Sorted Linked Lists having some Common nodes
55. Can we reverse a linked list in less than O(n)?
56. Clone a linked list with next and random pointer | Set 1
57. Clone a linked list with next and random pointer | Set 2
58. Insertion Sort for Singly Linked List
59. Point to next higher value node in a linked list with an arbitrary pointer
60. Rearrange a given linked list in-place.
61. Sort a linked list that is sorted alternating ascending and descending orders?
62. Select a Random Node from a Singly Linked List
63. Why Quick Sort preferred for Arrays and Merge Sort for Linked Lists?
64. Merge two sorted linked lists such that merged list is in reverse order
65. Compare two strings represented as linked lists
66. Rearrange a linked list such that all even and odd positioned nodes are together
67. Rearrange a Linked List in Zig-Zag fashion
68. Add 1 to a number represented as linked list
69. Point arbit pointer to greatest value right side node in a linked list
70. Merge two sorted linked lists such that merged list is in reverse order
71. Convert a given Binary Tree to Doubly Linked List | Set
72. Check if a linked list of strings forms a palindrome
73. Sort linked list which is already sorted on absolute values
74. Delete last occurrence of an item from linked list
75. Delete a Linked List node at a given position
76. Linked List in java

Circular Linked List:

1. Circular Linked List Introduction and Applications,
2. Circular Linked List Traversal
3. Split a Circular Linked List into two halves
4. Sorted insert for circular linked list

Doubly Linked List:

1. Doubly Linked List Introduction and Insertion
2. Delete a node in a Doubly Linked List
3. Reverse a Doubly Linked List
4. The Great Tree-List Recursion Problem.
5. Copy a linked list with next and arbit pointer
6. QuickSort on Doubly Linked List
7. Swap Kth node from beginning with Kth node from end in a Linked List
8. Merge Sort for Doubly Linked List

Stacks:

1. Introduction to Stack
2. Infix to Postfix Conversion using Stack
3. Evaluation of Postfix Expression
4. Reverse a String using Stack
5. Implement two stacks in an array
6. Check for balanced parentheses in an expression
7. Next Greater Element
8. Reverse a stack using recursion
9. Sort a stack using recursion
10. The Stock Span Problem
11. Design and Implement Special Stack Data Structure
12. Implement Stack using Queues
13. Design a stack with operations on middle element
14. How to efficiently implement k stacks in a single array?
15. Iterative Tower of Hanoi
16. Length of the longest valid substring
17. Find maximum of minimum for every window size in a given array
18. Check if a given array can represent Preorder Traversal of Binary Search Tree
19. Minimum number of bracket reversals needed to make an expression balanced
20. Iterative Depth First Traversal of Graph
21. How to create mergable stack?
22. Print ancestors of a given binary tree node without recursion
23. Expression Evaluation
24. Largest Rectangular Area in a Histogram | Set 2
25. The Celebrity Problem
26. Iterative Postorder Traversal | Set 2 (Using One Stack)
27. Iterative Postorder Traversal | Set 1 (Using Two Stacks)
28. Implement a stack using single queue
29. Design a stack that supports getMin() in O(1) time and O(1) extra space

Queues:

1. Queue Introduction and Array Implementation
2. Linked List Implementation of Queue
3. Applications of Queue Data Structure
4. Priority Queue Introduction
5. Deque (Introduction and Applications)
6. Implement Queue using Stacks
7. Check whether a given Binary Tree is Complete or not
8. Find the largest multiple of 3
9. Find the first circular tour that visits all petrol pumps
10. Maximum of all subarrays of size k
11. An Interesting Method to Generate Binary Numbers from 1 to n
12. How to efficiently implement k Queues in a single array?
13. Minimum time required to rot all oranges
14. Iterative Method to find Height of Binary Tree
15. Construct Complete Binary Tree from its Linked List Representation
16. Implement LRU Cache
17. Breadth First Traversal for a Graph
18. Implement a stack using single queue

Binary Tree:

1. Binary Tree Introduction
2. Handshaking Lemma and Interesting Tree Properties
3. Binary Tree Properties
4. Types of Binary Tree
5. Enumeration of Binary Tree
6. Applications of tree data structure
7. Tree Traversals
8. BFS vs DFS for Binary Tree
9. Level Order Tree Traversal
10. Print level order traversal line by line
11. Inorder Tree Traversal without Recursion
12. Inorder Tree Traversal without recursion and without stack!
13. Threaded Binary Tree
14. Size of a tree
15. Determine if Two Trees are Identical
16. Maximum Depth or Height of a Tree
17. Write a C program to Delete a Tree.
18. Write an Efficient C Function to Convert a Binary Tree into its Mirror Tree
19. If you are given two traversal sequences, can you construct the binary tree?
20. Given a binary tree, print out all of its root-to-leaf paths one per line.
21. The Great Tree-List Recursion Problem.
22. Count leaf nodes in a binary tree
23. Level order traversal in spiral form
24. Check for Children Sum Property in a Binary Tree.
25. Convert an arbitrary Binary Tree to a tree that holds Children Sum Property
26. Diameter of a Binary Tree
27. How to determine if a binary tree is height-balanced?
28. Root to leaf path sum equal to a given number
29. Construct Tree from given Inorder and Preorder traversals
30. Given a binary tree, print all root-to-leaf paths
31. Double Tree
32. Maximum width of a binary tree
33. Foldable Binary Trees
34. Print nodes at k distance from root
35. Get Level of a node in a Binary Tree
36. Print Ancestors of a given node in Binary Tree
37. Check if a given Binary Tree is SumTree
38. Check if a binary tree is subtree of another binary tree
39. Connect nodes at same level
40. Connect nodes at same level using constant extra space
41. Populate Inorder Successor for all nodes
42. Convert a given tree to its Sum Tree
43. Vertical Sum in a given Binary Tree
44. Find the maximum sum leaf to root path in a Binary Tree
45. Construct Special Binary Tree from given Inorder traversal
46. Construct a special tree from given preorder traversal
47. Check whether a given Binary Tree is Complete or not
48. Boundary Traversal of binary tree
49. Construct Full Binary Tree from given preorder and postorder traversals
50. Iterative Preorder Traversal
51. Morris traversal for Preorder
52. Linked complete binary tree & its creation
53. Ternary Search Tree
54. Largest Independent Set Problem
55. Iterative Postorder Traversal | Set 1 (Using Two Stacks)
56. Iterative Postorder Traversal | Set 2 (Using One Stack)
57. Reverse Level Order Traversal
58. Construct Complete Binary Tree from its Linked List Representation
59. Convert a given Binary Tree to Doubly Linked List | Set 1
60. Tree Isomorphism Problem
61. Find all possible interpretations of an array of digits
62. Iterative Method to find Height of Binary Tree
63. Custom Tree Problem
64. Convert a given Binary Tree to Doubly Linked List | Set 2
65. Print ancestors of a given binary tree node without recursion
66. Difference between sums of odd level and even level nodes of a Binary Tree
67. Print Postorder traversal from given Inorder and Preorder traversals
68. Find depth of the deepest odd level leaf node
69. Check if all leaves are at same level
70. Print Left View of a Binary Tree
71. Remove all nodes which don’t lie in any path with sum>= k
72. Extract Leaves of a Binary Tree in a Doubly Linked List
73. Deepest left leaf node in a binary tree
74. Find next right node of a given key
75. Sum of all the numbers that are formed from root to leaf paths
76. Convert a given Binary Tree to Doubly Linked List | Set 3
77. Lowest Common Ancestor in a Binary Tree | Set 1
78. Find distance between two given keys of a Binary Tree
79. Print all nodes that are at distance k from a leaf node
80. Check if a given Binary Tree is height balanced like a Red-Black Tree,
81. Print all nodes at distance k from a given node
82. Print a Binary Tree in Vertical Order | Set 1
83. Construct a tree from Inorder and Level order traversals
84. Find the maximum path sum between two leaves of a binary tree
85. Reverse alternate levels of a perfect binary tree
86. Check if two nodes are cousins in a Binary Tree
87. Check if a binary tree is subtree of another binary tree | Set 2
88. Serialize and Deserialize a Binary Tree
89. Print nodes between two given level numbers of a binary tree
90. closest leaf in a Binary Tree
91. Convert a Binary Tree to Threaded binary tree
92. Print Nodes in Top View of Binary Tree
93. Bottom View of a Binary Tree
94. Perfect Binary Tree Specific Level Order Traversal
95. Convert left-right representation of a bianry tree to down-right
96. Minimum no. of iterations to pass information to all nodes in the tree
97. Clone a Binary Tree with Random Pointers
98. Given a binary tree, how do you remove all the half nodes?
99. Vertex Cover Problem | Set 2 (Dynamic Programming Solution for Tree)
100. Check whether a binary tree is a full binary tree or not
101. Find sum of all left leaves in a given Binary Tree
102. Remove nodes on root to leaf paths of length < K
103. Find Count of Single Valued Subtrees
104. Check if a given array can represent Preorder Traversal of Binary Search Tree
105. Mirror of n-ary Tree
106. Find multiplication of sums of data of leaves at sane levels
107. Succinct Encoding of Binary Tree
108. Construct Binary Tree from given Parent Array representation
109. Symmetric Tree (Mirror Image of itself)
110. Find Minimum Depth of a Binary Tree
111. Maximum Path Sum in a Binary Tree
112. Expression Tree
113. Check whether a binary tree is a complete tree or not | Set 2 (Recursive Solution)
114. Change a Binary Tree so that every node stores sum of all nodes in left subtree
115. Iterative Search for a key ‘x’ in Binary Tree
116. Find maximum (or minimum) in Binary Tree

Binary Search Tree:

1. Search and Insert in BST
2. Deletion from BST
3. Data Structure for a single resource reservations
4. Advantages of BST over Hash Table
5. Minimum value in a Binary Search Tree
6. Inorder predecessor and successor for a given key in BST
7. Check if a binary tree is BST or not
8. Lowest Common Ancestor in a Binary Search Tree.
9. Sorted order printing of a given array that represents a BST
10. Inorder Successor in Binary Search Tree
11. Find k-th smallest element in BST (Order Statistics in BST)
12. K’th smallest element in BST using O(1) Extra Space
13. Print BST keys in the given range
14. Sorted Array to Balanced BST
15. Find the largest BST subtree in a given Binary Tree
16. Check for Identical BSTs without building the trees
17. Add all greater values to every node in a given BST
18. Remove BST keys outside the given range
19. Check if each internal node of a BST has exactly one child
20. Find if there is a triplet in a Balanced BST that adds to zero
21. Merge two BSTs with limited extra space
22. Two nodes of a BST are swapped, correct the BST
23. Construct BST from given preorder traversal | Set 1
24. Construct BST from given preorder traversal | Set 2
25. Floor and Ceil from a BST
26. Convert a BST to a Binary Tree such that sum of all greater keys is added to every key
27. Sorted Linked List to Balanced BST
28. In-place conversion of Sorted DLL to Balanced BST
29. Find a pair with given sum in a Balanced BST
30. Total number of possible Binary Search Trees with n keys
31. Merge Two Balanced Binary Search Trees
32. Binary Tree to Binary Search Tree Conversion
33. Transform a BST to greater sum tree
34. K’th Largest Element in BST when modification to BST is not allowed
35. How to handle duplicates in Binary Search Tree?
36. Print Common Nodes in Two Binary Search Trees
37. Construct all possible BSTs for keys 1 to N
38. Print Common Nodes in Two Binary Search Trees
39. Count BST subtrees that lie in given range
40. Count BST nodes that lie in a given range
41. How to implement decrease key or change key in Binary Search Tree
42. Second largest element in BST
43. Count inversions in an array | Set 2 (Using Self-Balancing BST)

Matrix:

1. Search in a row wise and column wise sorted matrix
2. Print a given matrix in spiral form
3. A Boolean Matrix Question
4. Print unique rows in a given boolean matrix
5. Maximum size square sub-matrix with all 1s
6. Inplace M x N size matrix transpose | Updated
7. Print Matrix Diagonally
8. Dynamic Programming | Set 27 (Maximum sum rectangle in a 2D matrix)
9. Strassen’s Matrix Multiplication
10. Create a matrix with alternating rectangles of O and X
11. Find the row with maximum number of 1s
12. Print all elements in sorted order from row and column wise sorted matrix
13. Given an n x n square matrix, find sum of all sub-squares of size k x k
14. Count number of islands where every island is row-wise and column-wise separated
15. Given a matrix of ‘O’ and ‘X’, replace ‘O’ with ‘X’ if surrounded by ‘X’
16. Find the longest path in a matrix with given constraints
17. Given a Boolean Matrix, find k such that all elements in k’th row are 0 and k’th column are 1.
18. Find the largest rectangle of 1’s with swapping of columns allowed
19. Validity of a given Tic-Tac-Toe board configuration
20. Minimum Initial Points to Reach Destination
21. Find length of the longest consecutive path from a given starting character
22. Collect maximum points in a grid using two traversals
23. Rotate Matrix Elements
24. Find sum of all elements in a matrix except the elements in row and/or column of given cell?
25. Find a common element in all rows of a given row-wise sorted matrix
26. Number of paths with exactly k coins
27. Collect maximum coins before hitting a dead end
28. Program for Rank of Matrix
29. Submatrix Sum Queries
30. Maximum size rectangle binary sub-matrix with all 1s
31. Count Negative Numbers in a Column-Wise and Row-Wise Sorted Matrix
32. Construct Ancestor Matrix from a Given Binary Tree
33. Construct tree from ancestor matrix
34. In-place convert matrix in specific order
35. Common elements in all rows of a given matrix
36. Print maximum sum square sub-matrix of given size
37. Find a specific pair in Matrix
38. Find orientation of a pattern in a matrix
39. Shortest path in a Binary Maze
40. Inplace rotate square matrix by 90 degrees
41. Return previous element in an expanding matrix