500+ Data Structures and Algorithms practice problems

Array

1.Find pair with given sum in the array

2.Check if subarray with 0 sum is exists or not

3.Print all sub-arrays with 0 sum

4.Sort binary array in linear time

5.Find a duplicate element in a limited range array

6.Find largest sub-array formed by consecutive integers

7.Find maximum length sub-array having given sum

8.Find maximum length sub-array having equal number of 0's and 1's

9.Sort an array containing 0's, 1's and 2's (Dutch national flag problem)

10.Inplace merge two sorted arrays

11.Merge two arrays by satisfying given constraints

12.Find index of 0 to replaced to get maximum length sequence of continuous ones

13.Find maximum product of two integers in an array

14.Shuffle a given array of elements (Fisher–Yates shuffle)

15.Rearrange the array with alternate high and low elements

16.Find equilibrium index of an array

17.Find majority element in an array (Boyer–Moore majority vote algorithm)

18.Move all zeros present in the array to the end

19.Replace each element of array with product of every other element without using / operator

20.Find Longest Bitonic Subarray in an array

21.Find maximum difference between two elements in the array by satisfying given constraints

22.Maximum subarray problem (Kadane's algorithm)

23.Print continuous subarray with maximum sum

24.Maximum Sum Circular Subarray

25.Find all distinct combinations of given length

26.Find all distinct combinations of given length with repetition allowed

27.Find maximum sequence of continuous 1's formed by replacing at-most k zeroes by ones

28.Find minimum sum subarray of given size k

29.Find subarray having given sum in given array of integers

30.Find the length of smallest subarray whose sum of elements is greater than the given number

31.Find largest number possible from set of given numbers

32.Find the smallest window in array sorting which will make the entire array sorted

33.Find maximum sum path involving elements of given arrays

34.Maximum profit earned by buying and selling shares any number of times

35.Trapping Rain Water within given set of bars

36.Longest Increasing Subsequence

37.Longest Decreasing Subsequence Problem

38.Find maximum product subarray in a given array

39.Find maximum sum of subsequence with no adjacent elements

40.Find minimum platforms needed in the station so to avoid any delay in arrival of any train

41.Decode the array constructed from another array

42.Sort an array using one swap

43.Find Triplet with given sum in an array

44.Length of longest continuous sequence with same sum in given binary arrays

[45.Rearrange array such that A[A[i]] is set to i for every element A[i]](http://www.techiedelight.com/rearrange-array-such-that-array-index-is-set-to-i/)

46.Reverse every consecutive m elements of the given subarray

47.Maximum Product Subset Problem

48.Find pairs with given difference k in the array

49.Find pairs with given difference k in the array | Constant space solution

50.4 sum problem | Quadruplets with given sum

51.Print all quadruplets with given sum | 4-sum problem extended

52.Find odd occurring element in an array in single traversal

53.Find two odd occurring element in an array without using any extra space

54.Quickselect Algorithm

55.Print all Triplets that forms Arithmetic Progression

56.Print all triplets that forms Geometric Progression

57.Print all combination of numbers from 1 to n having sum n

58.Replace each element of the array by its corresponding rank in the array

59.Print all Triplets in an array with sum less than or equal to given number

60.Group elements of an array based on their first occurrence

61.Find minimum difference between index of two given elements present in the array

62.Find maximum absolute difference between sum of two non-overlapping sub-arrays

63.Find all Symmetric Pairs in an Array of Pairs

64.Partition an array into two sub-arrays with the same sum

65.Find count of distinct elements in every sub-array of size k

66.Find two numbers with maximum sum formed by array digits

67.Print all sub-arrays of an array having distinct elements

68.Find a Triplet having Maximum Product in an Array

69.Find ways to calculate a target from elements of specified array

70.Find Minimum Index of Repeating Element in an Array

71.Generate Random Input from an Array according to given Probabilities

72.Find pair in an array having minimum absolute sum

73.Find Index of Maximum Occurring Element with Equal Probability

74.Check if an Array is Formed by Consecutive Integers

75.Find two non-overlapping pairs having same sum in an array

76.Find Minimum Product among all Combinations of Triplets in an Array

77.Replace every element of an array with the least greater element on its right

78.Find all odd occurring elements in an array having limited range of elements

79.Add elements of two arrays into a new array

80.Count the distinct absolute values in the sorted array

81.Print all combinations of positive integers in increasing order that sum to a given number

82.Find all distinct combinations of given length — Part 2

83.Find subarrays with given sum in an array

84.Find the surpasser count for each element of an array

85.Find maximum length sequence of continuous ones (Using Sliding Window)

86.Find maximum length sequence of continuous ones

87.Merging Overlapping Intervals

88.Activity Selection Problem

89.Job Sequencing Problem with Deadlines

90.Introduction to Priority Queues using Binary Heaps

91.Min Heap and Max Heap Implementation in C++

92.Min Heap and Max Heap Implementation in Java

93.Heap Sort (Out-of-place and In-place implementation in C++ and C)

94.Check if given array represents min heap or not

95.Convert Max Heap to Min Heap in linear time

96.Find K’th largest element in an array

97.Sort a K-Sorted Array

98.Merge M sorted lists of variable length

99.Find K’th smallest element in an array

100.Find smallest range with at-least one element from each of the given lists

101.Merge M sorted lists each containing N elements

102.Insertion sort | Iterative & Recursive

103.Selection sort | Iterative & Recursive

104.Bubble sort | Iterative & Recursive

105.Merge Sort

106.Quicksort

107.Iterative Implementation of Quicksort

108.Hybrid QuickSort

109.Quicksort using Dutch National Flag Algorithm

110.Quick Sort using Hoare’s Partitioning scheme

111.External merge sort

112.Custom Sort | Sort elements by their frequency and Index

113.Custom Sort | Sort elements of the array by order of elements defined by the second array

114.Inversion Count of an array

115.Segregate positive and negative integers in linear time

116.Binary Search

117.Ternary Search vs Binary search

118.Interpolation search

119.Exponential search

120.Find number of rotations in a circularly sorted array

121.Search an element in a circular sorted array

122.Find first or last occurrence of a given number in a sorted array

123.Count occurrences of a number in a sorted array with duplicates

124.Find smallest missing element from a sorted array

125.Find Floor and Ceil of a number in a sorted array

126.Search in a nearly sorted array in O(logn) time

127.Find number of 1’s in a sorted binary array

128.Find the peak element in an array

129.Maximum Sum Subarray using Divide & Conquer

130.Find Minimum and Maximum element in an array using minimum comparisons

131.Matrix Chain Multiplication

132.0–1 Knapsack problem

133.Maximize value of the expression

134.Partition problem

135.Subset sum problem

136.Minimum Sum Partition problem

137.Rod Cutting

138.Coin change-making problem (unlimited supply of coins)

139.Coin Change Problem (Total number of ways to get the denomination of coins)

140.Longest alternating subsequence

141.Combinations of words formed by replacing given numbers with corresponding alphabets

142.Decode the given sequence to construct minimum number without repeated digits

143.All combinations of elements satisfying given constraints

144.Find Missing Term in a Sequence in log(n) time

145.Print all distinct Subsets of a given Set

146.Find Floor and Ceil of a number in a sorted array (Recursive solution)

147.Set both elements of a binary array to 0 in single line

148.K-Partition Problem | Printing all Partitions

149.3 Partition Problem

150.3-partition problem extended | Print all partitions

151.Iterative Merge Sort Algorithm (Bottom-up Merge Sort)

152.Find two duplicate elements in an limited range array (using XOR)

153.Find missing number and duplicate elements in an array

154.Find Minimum and Maximum element in an array by doing minimum comparisons

155.Find Frequency of each element in a sorted array containing duplicates

156.Difference between Subarray, Subsequence and Subset

Backtracking

1.Print all possible solutions to N Queens problem

2.Print all Possible Knight's Tours in a chessboard

3.Find Shortest Path in Maze

4.Find Longest Possible Route in a Matrix

5.Find path from source to destination in a matrix that satisfies given constraints

6.Find total number of unique paths in a maze from source to destination

7.Print All Hamiltonian Path present in a graph

8.Print all k-colorable configurations of the graph (Vertex coloring of graph)

9.Find all Permutations of a given string

10.All combinations of elements satisfying given constraints

11.Find all binary strings that can be formed from given wildcard pattern

12.K-Partition Problem | Printing all Partitions

13.Magnet Puzzle

14.Find ways to calculate a target from elements of specified array

15.Find minimum number possible by doing at-most K swaps

16.Determine if a pattern matches with a string or not

Binary

1.Bit Hacks—Part 1 (Basic)

2.Bit Hacks—Part 2 (Playing with k'th bit)

3.Bit Hacks—Part 3 (Playing with rightmost set bit of a number)

4.Bit Hacks—Part 4 (Playing with letters of English alphabet)

5.Bit Hacks—Part 5 (Find absolute value of an integer without branching)

6.Bit Hacks—Part 6 (Random Problems)

7.Brian Kernighan's Algorithm to count set bits in an integer

8.Compute parity of a number using lookup table

9.Count set bits using lookup table

10.Find the minimum or maximum of two integers without using branching

11.Multiply 16-bit integers using 8-bit multiplier

12.Round up to the next highest power of 2

13.Round up to the previous power of 2

14.Swap individual bits at given position in an integer

15.Check if given number is power of 4 or not

16.Reverse Bits of a given Integer

17.Find odd occurring element in an array in single traversal

18.Find two odd occurring element in an array without using any extra space

19.Swap two bits at given position in an integer

20.Add binary representation of two integers

21.Swap Adjacent Bits of a Number

22.Print all distinct Subsets of a given Set

23.Perform Division of two numbers without using division operator (/)

24.Check if adjacent bits are set in binary representation of a given number

25.Conditionally negate a value without branching

26.Find two duplicate elements in an limited range array (using XOR)

27.Find missing number and duplicate elements in an array

28.Check if given number is power of 8 or not

29.Circular shift on binary representation of an integer by k positions

30.Solve given set of problems without using multiplication or division operators

31.Reverse Bits of an integer using lookup table

32.Generate binary numbers between 1 to N

33.Efficiently implement power function | Recursive and Iterative

34.Find square of a number without using multiplication and division operator | 3 methods

35.Generate power set of a given set

36.Huffman Coding

37.Find all odd occurring elements in an array having limited range of elements

Binary Tree

1.Check if two given binary trees are identical or not | Iterative & Recursive

2.Calculate height of a binary tree | Iterative & Recursive

3.Delete given Binary Tree | Iterative & Recursive

4.Inorder Tree Traversal | Iterative & Recursive

5.Preorder Tree Traversal | Iterative & Recursive

6.Postorder Tree Traversal | Iterative & Recursive

7.Level Order Traversal of Binary Tree

8.Spiral Order Traversal of Binary Tree

9.Reverse Level Order Traversal of Binary Tree

10.Print all nodes of a given binary tree in specific order

11.Print left view of binary tree

12.Print Bottom View of Binary Tree

13.Print Top View of Binary Tree

14.Find next node in same level for given node in a binary tree

15.Check if given binary tree is complete binary tree or not

16.Determine if given two nodes are cousins of each other

17.Print cousins of given node in a binary tree

18.In-place convert given binary tree to its sum tree

19.Check if given binary tree is a sum tree or not

20.Combinations of words formed by replacing given numbers with corresponding alphabets

21.Determine if given binary tree is a subtree of another binary tree or not

22.Find diameter of a binary tree

23.Check if given binary Tree has symmetric structure or not

24.Convert binary tree to its mirror

25.Check if binary tree can be converted to another by doing any no. of swaps of left & right child

26.Find Lowest Common Ancestor (LCA) of two nodes in a binary tree

27.Print all paths from root to leaf nodes in given binary tree

28.Find ancestors of given node in a Binary Tree

29.Find the distance between given pairs of nodes in a binary tree

30.Find Vertical Sum in a given Binary Tree

31.Print nodes in vertical order of a given Binary Tree (Vertical Traversal)

32.Find the diagonal sum of given binary tree

33.Print Diagonal Traversal of Binary Tree

34.Print corner nodes of every level in binary tree

35.In-place convert convert given Binary Tree to Doubly Linked List

36.Sink nodes containing zero to the bottom of the binary tree

37.Convert given binary tree to full tree by removing half nodes

38.Truncate given binary tree to remove nodes which lie on a path having sum less than K

39.Find maximum sum root-to-leaf path in a binary tree

40.Check if given binary tree is height balanced or not

41.Convert normal binary tree to Left-child right-sibling binary tree

42.Determine if given Binary Tree is a BST or not

43.Convert a Binary Tree to BST by maintaining its original structure

44.Invert given Binary Tree | Recursive and Iterative solution

45.Print Right View of a Binary Tree

46.Print leaf to root path for every leaf node in a binary tree

47.Find maximum width of given binary tree

48.Build Binary Tree from given Parent array

49.C++ Program to Print Binary Tree Structure

50.Find all nodes at given distance from leaf nodes in a binary tree

51.Count all subtrees having same value of nodes in a binary tree

52.Find Maximum Difference Between a Node and its Descendants in a Binary Tree

53.Construct a Binary Tree from Ancestor Matrix

54.Calculate height of a binary tree with leaf nodes forming a circular doubly linked list

BST

1.Insertion in BST

2.Search given key in BST

3.Deletion from BST

4.Construct balanced BST from given keys

5.Determine if given Binary Tree is a BST or not

6.Check if given keys represents same BSTs or not without building the BST

7.Find inorder predecessor for given key in a BST

8.Find Lowest Common Ancestor (LCA) of two nodes in a Binary Search Tree

9.Find K'th smallest and K'th largest element in BST

10.Floor and Ceil in a Binary Search Tree

11.Find optimal cost to construct binary search tree

12.Convert a Binary Tree to BST by maintaining its original structure

13.Remove nodes from BST that have keys outside the valid range

14.Find a pair with given sum in a BST

15.Find inorder successor for given key in a BST

16.Replace every element of an array with the least greater element on its right

Divide & Conquer

1.Binary Search

2.Find number of rotations in a circularly sorted array

3.Search an element in a circular sorted array

4.Find first or last occurrence of a given number in a sorted array

5.Count occurrences of a number in a sorted array with duplicates

6.Find smallest missing element from a sorted array

7.Find Floor and Ceil of a number in a sorted array

8.Search in a nearly sorted array in O(logn) time

9.Find number of 1's in a sorted binary array

10.Find the peak element in an array

11.Maximum Sum Subarray using Divide & Conquer

12.Find Minimum and Maximum element in an array using minimum comparisons

13.Efficiently implement power function | Recursive and Iterative

14.Find Missing Term in a Sequence in log(n) time

15.Division of Two Numbers using Binary Search Algorithm

16.Find Floor and Ceil of a number in a sorted array (Recursive solution)

17.Find Minimum and Maximum element in an array by doing minimum comparisons

18.Find Frequency of each element in a sorted array containing duplicates

19.Ternary Search vs Binary search

20.Exponential search

21.Interpolation search

22.Merge Sort Algorithm

23.Iterative Merge Sort Algorithm (Bottom-up Merge Sort)

24.Merge Sort Algorithm for Singly Linked List

25.Inversion Count of an array

26.Quicksort Algorithm

27.Iterative Implementation of Quicksort

28.Hybrid QuickSort

29.Quicksort using Dutch National Flag Algorithm

30.Quick Sort using Hoare's Partitioning scheme

Dynamic Programming

1.Introduction to Dynamic Programming

2.Longest Common Subsequence | Introduction & LCS Length

3.Longest Common Subsequence | Space optimized version

4.Longest Common Subsequence of K-sequences

5.Longest Common Subsequence | Finding all LCS

6.Longest Common Substring problem

7.Longest Palindromic Subsequence using Dynamic Programming

8.Longest Repeated Subsequence problem

9.Implement Diff Utility

10.Shortest Common Supersequence | Introduction & SCS Length

11.Shortest Common Supersequence | Finding all SCS

12.Shortest Common Supersequence | Using LCS

13.Longest Increasing Subsequence using Dynamic Programming

14.Longest Bitonic Subsequence

15.Increasing Subsequence with Maximum Sum

16.The Levenshtein distance (Edit distance) problem

17.Find size of largest square sub-matrix of 1's present in given binary matrix

18.Matrix Chain Multiplication

19.Find the minimum cost to reach last cell of the matrix from its first cell

20.Find longest sequence formed by adjacent numbers in the matrix

21.Count number of paths in a matrix with given cost to reach destination cell

22.0–1 Knapsack problem

23.Maximize value of the expression

24.Partition problem

25.Subset sum problem

26.Minimum Sum Partition problem

27.Find all N-digit binary strings without any consecutive 1's

28.Rod Cutting

29.Maximum Product Rod Cutting

30.Coin change-making problem (unlimited supply of coins)

31.Coin Change Problem — Find total number of ways to get the denomination of coins

32.Total possible solutions to linear equation of k variables

33.Longest alternating subsequence

34.Count number of times a pattern appears in given string as a subsequence

35.Collect maximum points in a matrix by satisfying given constraints

36.Count total possible combinations of N-digit numbers in a mobile keypad

37.Find optimal cost to construct binary search tree

38.Word Break Problem

39.Word Break Problem | Using Trie Data Structure

40.Determine Minimal Adjustment Cost of an Array

41.Check if a string is K-Palindrome or not

42.Wildcard Pattern Matching

43.Find probability that a person is alive after taking N steps on the island

44.Calculate sum of all elements in a sub-matrix in constant time

45.Find maximum sum K x K sub-matrix in a given M x N matrix

46.Find maximum sum submatrix present in a given matrix

47.Find maximum sum of subsequence with no adjacent elements

48.Maximum subarray problem (Kadane's algorithm)

49.Single-Source Shortest Paths — Bellman Ford Algorithm

50.All-Pairs Shortest Paths — Floyd Warshall Algorithm

51.Longest Decreasing Subsequence Problem

52.Pots of Gold Game using Dynamic Programming

53.Find minimum cuts needed for palindromic partition of a string

54.Maximum Length Snake Sequence

55.3 Partition Problem

56.Calculate size of the largest plus of 1's in binary matrix

57.Check if given string is interleaving of two other given strings

58.Longest Increasing Subsequence using LCS

59.Determine negative-weight cycle in a graph

Graphs

1.Terminology and Representations of Graphs

2.Graph Implementation using STL

3.Graph Implementation in C++ without using STL

4.Implement Graph Data Structure in C

5.Graph Implementation in Java using Collections

6.Breadth First Search (BFS) | Iterative & Recursive Implementation

7.Depth First Search (DFS) | Iterative & Recursive Implementation

8.Arrival and Departure Time of Vertices in DFS

9.Types of edges involved in DFS and relation between them

10.Bipartite Graph

11.Determine if a given graph is Bipartite Graph using DFS

12.Minimum number of throws required to win Snake and Ladder game

13.Topological Sorting in a DAG

14.Kahn's Topological Sort Algorithm

15.Transitive Closure of a Graph

16.Check if an undirected graph contains cycle or not

17.Total paths in given digraph from given source to destination having exactly m edges

18.Determine if an undirected graph is a Tree (Acyclic Connected Graph)

19.2-Edge Connectivity in the graph

20.2-Vertex Connectivity in the graph

21.Check if given digraph is a DAG (Directed Acyclic Graph) or not

22.Disjoint-Set Data Structure (Union-Find Algorithm)

23.Chess Knight Problem—Find Shortest path from source to destination

24.Check if given Graph is Strongly Connected or not

25.Check if given Graph is Strongly Connected or not using one DFS Traversal

26.Union-Find Algorithm for Cycle Detection in undirected graph

27.Kruskal's Algorithm for finding Minimum Spanning Tree

28.Single-Source Shortest Paths—Dijkstra's Algorithm

29.Single-Source Shortest Paths—Bellman Ford Algorithm

30.All-Pairs Shortest Paths—Floyd Warshall Algorithm

31.Find Cost of Shortest Path in DAG using one pass of Bellman-Ford

32.Least Cost Path in Weighted Digraph using BFS

33.Find maximum cost path in graph from given source to destination

34.Determine negative-weight cycle in a graph

35.Print all k-colorable configurations of the graph (Vertex coloring of graph)

36.Print All Hamiltonian Path present in a graph

37.Greedy coloring of graph

Heap

1.Introduction to Priority Queues using Binary Heaps

2.Min Heap and Max Heap Implementation in C++

3.Min Heap and Max Heap Implementation in Java

4.Heap Sort

5.Check if given array represents min heap or not

6.Convert Max Heap to Min Heap in linear time

7.Find K'th largest element in an array

8.Sort a K-Sorted Array

9.Merge M sorted lists of variable length

10.Find K'th smallest element in an array

11.Find smallest range with at-least one element from each of the given lists

12.Merge M sorted lists each containing N elements

13.External merge sort

14.Huffman Coding

15.Find first k maximum occurring words in given set of strings

16.Find first k non-repeating characters in a string in single traversal

Linked List

1.Introduction to Linked Lists

2.Linked List Implementation | Part 1

3.Linked List Implementation | Part 2

4.Static Linked List in C

5.Clone given Linked List

6.Delete Linked List

7.Pop operation in linked list

8.Insert given node into the correct sorted position in the given sorted linked list

9.Given a linked list, change it to be in sorted order

10.Split the nodes of the given linked list into front and back halves

11.Remove duplicates from a sorted linked list

12.Move front node of the given list to the front of the another list

13.Move even nodes to the end of the list in reverse order

14.Split given linked list into two lists where each list containing alternating elements from it

15.Construct a linked list by merging alternate nodes of two given lists

16.Merge given sorted linked lists into one

17.Merge Sort Algorithm for Singly Linked List

18.Intersection of two given sorted linked lists

19.Reverse linked list | Part 1 (Iterative Solution)

20.Reverse linked list | Part 2 (Recursive Solution)

21.Reverse every group of k nodes in given linked list

22.Find K'th node from the end in a linked list

23.Merge alternate nodes of two linked lists into the first list

24.Merge two sorted linked lists from their end

25.Delete every N nodes in a linked list after skipping M nodes

26.Rearrange linked list in specific manner in linear time

27.Check if linked list is palindrome or not

28.Move last node to front in a given Linked List

29.Rearrange the linked list in specific manner

30.Detect Cycle in a linked list (Floyd's Cycle Detection Algorithm)

31.Sort linked list containing 0's, 1's and 2's

32.Stack Implementation using Linked List

33.Queue Implementation using Linked List

34.Remove duplicates from a linked list

35.Rearrange the linked list so that it has alternating high, low values

36.Rearrange a Linked List by Separating Odd Nodes from the Even Ones

37.Calculate height of a binary tree with leaf nodes forming a circular doubly linked list

Matrix

1.Print Matrix in Spiral Order

2.Create Spiral Matrix from given array

3.Shift all matrix elements by 1 in Spiral Order

4.Find Shortest path from source to destination in a matrix that satisfies given constraints

5.Change all elements of row i and column j in a matrix to 0 if cell (i, j) has value 0

6.Print diagonal elements of the matrix having positive slope

7.Find all paths from first cell to last cell of a matrix

8.Replace all occurrences of 0 that are not surrounded by 1 in a binary matrix

9.In-place rotate the matrix by 90 degrees in clock-wise direction

10.Count negative elements present in sorted matrix in linear time

11.Report all occurrences of an element in row wise and column wise sorted matrix in linear time

12.Calculate sum of all elements in a sub-matrix in constant time

13.Find maximum sum K x K sub-matrix in a given M x N matrix

14.Find maximum sum submatrix present in a given matrix

15.Find probability that a person is alive after taking N steps on the island

16.Count the number of islands

17.Flood fill Algorithm

18.Find shortest safe route in a field with sensors present

19.Find all occurrences of given string in a character matrix

20.Shortest path in a Maze | Lee algorithm

21.Check if given matrix is Toeplitz matrix or not

22.In-place rotate the matrix by 180 degrees

23.Fill Binary Matrix with Alternating Rectangles of 0 and 1

24.Find all common elements present in every row of given matrix

25.Construct a Binary Tree from Ancestor Matrix

26.Find common elements present in all rows of a matrix

27.Travelling Salesman Problem using Branch and Bound

28.Collect maximum points in a matrix by satisfying given constraints

29.Count number of paths in a matrix with given cost to reach destination cell

30.Find longest sequence formed by adjacent numbers in the matrix

31.Find the minimum cost to reach last cell of the matrix from its first cell

32.Matrix Chain Multiplication

33.Find size of largest square sub-matrix of 1's present in given binary matrix

34.Chess Knight Problem—Find Shortest path from source to destination

35.Find Duplicate rows in a binary matrix

36.Print all possible solutions to N Queens problem

37.Print all Possible Knight's Tours in a chessboard

38.Find Shortest Path in Maze

39.Find Longest Possible Route in a Matrix

40.Calculate size of the largest plus of 1's in binary matrix

41.Find the maximum value of M[c][d]—M[a][b] over all choices of indexes

42.Find shortest distance of every cell from landmine in a Maze

43.Find shortest route in a device to construct the given string

Queue

1.Queue Implementation

2.Queue Implementation using Linked List

3.Chess Knight Problem—Find Shortest path from source to destination

4.Shortest path in a Maze | Lee algorithm

5.Find shortest safe route in a field with sensors present

6.Flood fill Algorithm

7.Count the number of islands

8.Find Shortest path from source to destination in a matrix that satisfies given constraints

9.Generate binary numbers between 1 to N

10.Calculate height of a binary tree | Iterative & Recursive

11.Delete given Binary Tree | Iterative & Recursive

12.Level Order Traversal of Binary Tree

13.Spiral Order Traversal of Binary Tree

14.Reverse Level Order Traversal of Binary Tree

15.Print all nodes of a given binary tree in specific order

16.Print left view of binary tree

17.Find next node in same level for given node in a binary tree

18.Check if given binary tree is complete binary tree or not

19.Print Diagonal Traversal of Binary Tree

20.Print corner nodes of every level in binary tree

21.Breadth First Search (BFS) | Iterative & Recursive Implementation

22.Minimum number of throws required to win Snake and Ladder game

23.Check if an undirected graph contains cycle or not

24.Invert given Binary Tree | Recursive and Iterative solution

25.Find maximum cost path in graph from given source to destination

26.Find shortest distance of every cell from landmine in a Maze

Sorting

1.Insertion sort | Iterative & Recursive

2.Selection sort | Iterative & Recursive

3.Bubble sort | Iterative & Recursive

4.Merge Sort Algorithm

5.Iterative Merge Sort Algorithm (Bottom-up Merge Sort)

6.Quicksort Algorithm

7.Iterative Implementation of Quicksort

8.Hybrid QuickSort

9.Quicksort using Dutch National Flag Algorithm

10.Quick Sort using Hoare's Partitioning scheme

11.External merge sort

12.Counting Sort Algorithm

13.Custom Sort | Sort elements by their frequency and Index

14.Custom Sort | Sort elements of the array by order of elements defined by the second array

15.Inversion Count of an array

16.Segregate positive and negative integers in linear time

17.Efficiently Sort an Array with many Duplicated Values

18.Find the smallest window in array sorting which will make the entire array sorted

19.Find largest number possible from set of given numbers

20.Move all zeros present in the array to the end

21.Sort binary array in linear time

22.Sort linked list containing 0's, 1's and 2's

23.Merge Sort Algorithm for Singly Linked List

24.Group anagrams together from given list of words

25.Activity Selection Problem

26.Lexicographic sorting of given set of keys

27.Heap Sort

28.Merge M sorted lists of variable length

29.Merge M sorted lists each containing N elements

30.Find all palindromic permutations of a string

31.Find all lexicographically next permutations of a string sorted in ascending order

32.Merge two sorted linked lists from their end

33.Sort an array containing 0's, 1's and 2's (Dutch national flag problem)

34.Find pair with given sum in the array

35.Inplace merge two sorted arrays

36.Merge two arrays by satisfying given constraints

37.Find maximum product of two integers in an array

38.Find all distinct combinations of given length

39.Find all distinct combinations of given length with repetition allowed

40.Merging Overlapping Intervals

41.Print all quadruplets with given sum | 4-sum problem extended

42.4 sum problem | Quadruplets with given sum

43.Find two numbers with maximum sum formed by array digits

44.Find a Triplet having Maximum Product in an Array

45.Find Minimum Product among all Combinations of Triplets in an Array

46.Find all distinct combinations of given length — Part 2

47.Find the surpasser count for each element of an array

Stack

1.Stack Implementation

2.Stack Implementation using Linked List

3.Check if given expression is balanced expression or not

4.Find duplicate parenthesis in an expression

5.Evaluate given postfix expression

6.Decode the given sequence to construct minimum number without repeated digits

7.Inorder Tree Traversal | Iterative & Recursive

8.Preorder Tree Traversal | Iterative & Recursive

9.Postorder Tree Traversal | Iterative & Recursive

10.Find ancestors of given node in a Binary Tree

11.Check if two given binary trees are identical or not | Iterative & Recursive

12.Reverse given text without reversing the individual words

13.Find all binary strings that can be formed from given wildcard pattern

14.Iterative Implementation of Quicksort

15.Depth First Search (DFS) | Iterative & Recursive Implementation

16.Invert given Binary Tree | Recursive and Iterative solution

17.Print leaf to root path for every leaf node in a binary tree

String

1.Check if given string is a rotated palindrome or not

2.Longest Palindromic Substring (Non-DP Space Optimized Solution)

3.Check if repeated subsequence is present in the string or not

4.Check if strings can be derived from each other by circularly rotating them

5.Check if given set of moves is circular or not

6.Convert given number into corresponding excel column name

7.Determine if two strings are anagram or not

8.Find all binary strings that can be formed from given wildcard pattern

9.Find all interleavings of given strings

10.Isomorphic Strings

11.Find all possible palindromic substrings in a string

12.Find all possible combinations of words formed from mobile keypad

13.Find all possible combinations by replacing given digits with characters of the corresponding list

14.Find all words from given list that follows same order of characters as given pattern

15.Find first k non-repeating characters in a string in single traversal

16.Group anagrams together from given list of words

17.Introduction to Pattern Matching

18.Inplace remove all occurrences of ‘AB’ and ‘C’ from the string

19.Longest even length palidromic sum substring

20.Print string in zig-zag form in k rows

21.Reverse given text without reversing the individual words

22.Run Length Encoding (RLE) data compression algorithm

23.Validate an IP address

24.Find the longest substring of given string containing k distinct characters

25.Find all palindromic permutations of a string

26.Find all substrings of a string that are permutation of a given string

27.Find the longest substring of given string containing all distinct characters

28.Find all Permutations of a given string

29.Iterative Approach to find Permutations of a String in C++ and Java

30.Generate all Permutations of a String in Java | Recursive & Iterative

31.Find all lexicographically next permutations of a string sorted in ascending order

32.Find Lexicographically minimal string rotation

33.Find all strings of given length containing balanced parentheses

34.Find all N-digit strictly increasing numbers (Bottom-Up and Top-Down Approach)

35.Find all N-digit binary numbers having more 1’s than 0’s for any prefix

36.Find all N-digit numbers with given sum of digits

37.Find all N-digit binary numbers with k-bits set where k ranges from 1 to N

38.Generate binary numbers between 1 to N

39.Find all combinations of non-overlapping substrings of a string

40.Check if given sentence is syntactically correct or not

41.Calculate rank of given string among all its lexicographically sorted permutations

42.Find all Lexicographic Permutations of a String

43.Find all N-digit binary numbers with equal sum of bits in its two halves

44.Check if given string is interleaving of two other given strings

45.Difference between Subarray, Subsequence and Subset

46.std::next_permutation | Overview & Implementation in C++

47.std::prev_permutation | Overview & Implementation in C++

48.Implementation of KMP Algorithm in C, C++ and Java

49.Reverse String without using Recursion

50.Reverse given string using Recursion

51.Reverse a String in Java in 10 different ways

52.Determine if a given string is palindrome or not

53.In-place remove all adjacent duplicates from the given string

54.Find the minimum number of inversions needed to make the given expression balanced

55.Replace all non-overlapping occurrences of the pattern

56.Construct the longest palindrome by shuffling or deleting characters from a string

57.Determine if characters of a String follows a specified order or not

58.Print all combinations of phrases that can be formed by picking words from each of the given lists

59.Remove all extra spaces from a string

60.Break a string into all possible combinations of non-overlapping substrings

61.Remove adjacent duplicate characters from a string

62.Combinations of words formed by replacing given numbers with corresponding alphabets

63.Word Break Problem

64.Wildcard Pattern Matching

65.Count number of times a pattern appears in given string as a subsequence

66.The Levenshtein distance (Edit distance) problem

67.Longest Common Subsequence | Introduction & LCS Length

68.Longest Common Subsequence | Space optimized version

69.Longest Common Subsequence of K-sequences

70.Longest Common Subsequence | Finding all LCS

71.Longest Repeated Subsequence problem

72.Longest Palindromic Subsequence using Dynamic Programming

73.Longest Common Substring problem

74.Shortest Common Supersequence | Introduction & SCS Length

75.Shortest Common Supersequence | Finding all SCS

76.Shortest Common Supersequence | Using LCS

77.Implement Diff Utility

78.Word Break Problem | Using Trie Data Structure

79.Find minimum cuts needed for palindromic partition of a string

80.Check if a string is K-Palindrome or not

81.Find shortest route in a device to construct the given string

82.Find minimum number possible by doing at-most K swaps

83.Determine if a pattern matches with a string or not

Trie

1.Trie Implementation | Insert, Search and Delete

2.Memory efficient Trie Implementation using Map | Insert, Search and Delete

3.C++ Implementation of Trie Data Structure

4.Longest Common Prefix in given set of strings (using Trie)

5.Lexicographic sorting of given set of keys

6.Find maximum occurring word in given set of strings

7.Find first k maximum occurring words in given set of strings

8.Find Duplicate rows in a binary matrix

9.Word Break Problem | Using Trie Data Structure

Greedy

1.Activity Selection Problem

2.Huffman Coding

3.Shortest Superstring Problem

4.Job Sequencing Problem with Deadlines

5.Greedy coloring of graph

6.Kruskal's Algorithm for finding Minimum Spanning Tree

7.Single-Source Shortest Paths — Dijkstra's Algorithm

Puzzles

1.Clock angle problem — Find angle between hour and minute hand

2.Add two numbers without using addition operator | 4 methods

3.Generate power set of a given set

4.Implement power function without using multiplication and division operators

5.Print all numbers between 1 to N without using semicolon

6.Swap two numbers without using third variable | 5 methods

7.Determine the if condition to print specific output

8.Find maximum, minimum of three numbers without using conditional statement and ternary operator | 4 methods

9.Find numbers represented as sum of two cubes for two different pairs

10.Print “Hello World” with empty main() function | 3 methods

11.Tower of Hanoi Problem

12.Print all numbers between 1 to N without using any loop | 4 methods

13.Print a semicolon without using semicolon anywhere in the program

14.Multiply two numbers without using multiplication operator or loops

15.Find square of a number without using multiplication and division operator | 3 methods

16.Find if a number is even or odd without using any conditional statement

17.Set both elements of a binary array to 0 in single line

18.Find minimum number without using conditional statement or ternary operator

19.Perform Division of two numbers without using division operator (/)

20.Generate 0 and 1 with 75% and 25% Probability

21.Generate Desired Random Numbers With Equal Probability

22.Return 0, 1 and 2 with equal Probability using the specified function

23.Generate Fair Results from a Biased Coin

24.Generate numbers from 1 to 7 with equal probability using specified function

25.Implement Ternary Operator Without Using Conditional Expressions

26.Determine if two integers are equal without using comparison and arithmetic operators

27.Return 0 and 1 with equal Probability using the specified function

28.Generate Random Input from an Array according to given Probabilities

29.Generate Fair Results from a Biased Coin

30.Magnet Puzzle