

Array

Rearrange the array with alternate high and low elements

Sort binary array in linear time

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

Find pair with given sum in the array

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

Find equilibrium index of an array

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

Move all zeros present in the array to the end

Inplace merge two sorted arrays

Merge two arrays by satisfying given constraints

Find sub-array with 0 sum

Find maximum length sub-array having given sum

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

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

Find maximum product of two integers in an array

Replace each element of array with product of every other element without using division operator

Find a duplicate element in a limited range array

Find largest sub-array formed by consecutive integers

Find Longest Bitonic Subarray in an array

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

Maximum subarray problem (Kadane's algorithm)

Maximum Sum Circular Subarray

Find all distinct combinations of given length

Find all distinct combinations of given length with repetition allowed

Find max sequence of continuous 1's that can be formed by replacing at-most k zeroes by ones

Find minimum sum subarray of given size k

Find subarray having given sum in given array of integers

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

Find largest number possible from set of given numbers

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

Find maximum sum path involving elements of given arrays

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

Trapping Rain Water within given set of bars

Longest Increasing Subsequence

Find maximum product subarray in a given array

Find maximum sum of subsequence with no adjacent elements

Find min number of platforms needed in the station so to avoid any delay in arrival of any train

Merging Overlapping Intervals
Activity Selection Problem
Job Sequencing Problem with Deadlines
Introduction to Priority Queues using Binary Heaps
Min Heap and Max Heap Implementation in C++
Heap Sort (Out-of-place and In-place implementation in C++ and C)
Check if given array represents min heap or not
Convert Max Heap to Min Heap in linear time
Find K'th largest element in an array
Sort a K-Sorted Array
Merge M sorted lists of variable length
Find K'th smallest element in an array
Find smallest range with at-least one element from each of the given lists
Merge M sorted lists each containing N elements
Insertion sort | Iterative & Recursive
Selection sort | Iterative & Recursive
Bubble sort | Iterative & Recursive
Merge Sort
Quicksort
Iterative Implementation of Quicksort
Hybrid QuickSort
External merge sort
Custom Sort | Sort elements by their frequency and Index
Custom Sort | Sort elements of the array by order of elements defined by the second array
Inversion Count of an array
Segregate positive and negative integers in linear time
Binary Search
Ternary Search vs Binary search
Interpolation search
Exponential search
Find number of rotations in a circularly sorted array
Search an element in a circular sorted array
Find first or last occurrence of a given number in a sorted array
Count occurrences of a number in a sorted array with duplicates
Find smallest missing element from a sorted array
Find Floor and Ceil of a number in a sorted array
Search in a nearly sorted array in $O(\log n)$ time
Find number of 1's in a sorted binary array
Find the peak element in an array
Maximum Sum Subarray using Divide & Conquer

Find Minimum and Maximum element in an array using minimum comparisons
Matrix Chain Multiplication
0-1 Knapsack problem
Maximize value of the expression
Partition problem
Subset sum problem
Minimum Sum Partition problem
Rod Cutting
Coin change-making problem (unlimited supply of coins)
Coin Change Problem – Find total number of ways to get the denomination of coins
Longest alternating subsequence
Combinations of words formed by replacing given numbers with corresponding English alphabets
Decode the given sequence to construct minimum number without repeated digits
All combinations of elements satisfying given constraints

Backtracking

Print all possible solutions to N Queens problem
Print all Possible Knight's Tours in a chessboard
Magnet Puzzle
Find Shortest Path in Maze
Find Longest Possible Route in a Matrix
Find path from source to destination in a matrix that satisfies given constraints
Find total number of unique paths in a maze from source to destination
Print All Hamiltonian Path present in a graph
Print all k-colorable configurations of the graph (Vertex coloring of graph)
Find all Permutations of a given string
Find all binary strings that can be formed from given wildcard pattern
All combinations of elements satisfying given constraints

Binary

Bit Hacks – Part 1 (Basic)
Bit Hacks – Part 2 (Playing with k'th bit)

Bit Hacks – Part 3 (Playing with rightmost set bit of a number)
Bit Hacks – Part 4 (Playing with letters of English alphabet)
Bit Hacks – Part 5 (Find absolute value of an integer without branching)
Bit Hacks – Part 6 (Random Problems)
Brian Kernighan's Algorithm to count set bits in an integer
Compute parity of a number using lookup table
Count set bits using lookup table
Find the minimum or maximum of two integers without using branching
Multiply 16-bit integers using 8-bit multiplier
Round up to the next highest power of 2
Round up to the previous power of 2
Swap individual bits at given position in an integer
Reverse Bits of a given Integer

Generate binary numbers between 1 to N
Efficiently implement power function | Recursive and Iterative
Find square of a number without using multiplication and division operator | 3 methods
Generate power set of a given set
Huffman Coding

Binary Tree

Check if two given binary trees are identical or not | Iterative & Recursive
Calculate height of a binary tree | Iterative & Recursive
Delete given Binary Tree | Iterative & Recursive
Inorder Tree Traversal | Iterative & Recursive
Preorder Tree Traversal | Iterative & Recursive
Postorder Tree Traversal | Iterative & Recursive
Level Order Traversal of Binary Tree
Spiral Order Traversal of Binary Tree
Reverse Level Order Traversal of Binary Tree
Print all nodes of a given binary tree in specific order
Print left view of binary tree
Print Bottom View of Binary Tree
Print Top View of Binary Tree
Find next node in same level for given node in a binary tree
Check if given binary tree is complete binary tree or not
Determine if given two nodes are cousins of each other

Print cousins of given node in a binary tree
In-place convert given binary tree to its sum tree
Check if given binary tree is a sum tree or not
Combinations of words formed by replacing given numbers with corresponding English alphabets
Determine if given binary tree is a subtree of another binary tree or not
Find diameter of a binary tree
Check if given binary Tree has symmetric structure or not
Convert binary tree to its mirror
Determine if binary tree can be converted to another by doing any no. of swaps of left & right child
Find Lowest Common Ancestor (LCA) of two nodes in a binary tree
Print all paths from root to leaf nodes in given binary tree
Find ancestors of given node in a Binary Tree
Find the distance between given pairs of nodes in a binary tree
Find Vertical Sum in a given Binary Tree
Print nodes in vertical order of a given Binary Tree (Vertical Traversal)
Find the diagonal sum of given binary tree
Print Diagonal Traversal of Binary Tree
Print corner nodes of every level in binary tree
In-place convert convert given Binary Tree to Doubly Linked List
Sink nodes containing zero to the bottom of the binary tree
Convert given binary tree to full tree by removing half nodes
Truncate given binary tree to remove nodes which lie on a path having sum less than K
Find maximum sum root-to-leaf path in a binary tree
Check if given binary tree is height balanced or not
Determine if given Binary Tree is a BST or not

Binary Search Tree (BST)

Insertion in BST
Search given key in BST
Deletion from BST
Construct balanced BST from given keys
Determine if given Binary Tree is a BST or not
Check if given keys represents same BSTs or not without building the BST
Find inorder predecessor for given key in a BST
Find Lowest Common Ancestor (LCA) of two nodes in a Binary Search Tree
Find K'th smallest and K'th largest element in BST

Floor and Ceil in a Binary Search Tree
Find optimal cost to construct binary search tree

Divide & Conquer

Binary Search
Ternary Search vs Binary search
Exponential search
Interpolation search
Find number of rotations in a circularly sorted array
Search an element in a circular sorted array
Find first or last occurrence of a given number in a sorted array
Count occurrences of a number in a sorted array with duplicates
Find smallest missing element from a sorted array
Find Floor and Ceil of a number in a sorted array
Search in a nearly sorted array in $O(\log n)$ time
Find number of 1's in a sorted binary array
Find the peak element in an array
Maximum Sum Subarray using Divide & Conquer
Find Minimum and Maximum element in an array using minimum comparisons
Efficiently implement power function | Recursive and Iterative

Merge Sort
Merge Sort for Singly Linked List
Inversion Count of an array
Quicksort
Iterative Implementation of Quicksort
Hybrid QuickSort

Dynamic Programming

Introduction to Dynamic Programming

Longest Common Subsequence | Introduction & LCS Length

Longest Common Subsequence | Space optimized version

Longest Common Subsequence | Finding all LCS

Longest Common Subsequence of K-sequences

Longest Common Substring problem

Longest Palindromic Subsequence using Dynamic Programming

Longest Repeated Subsequence problem

Shortest Common Supersequence | Introduction & SCS Length

Shortest Common Supersequence | Finding all SCS

Shortest Common Supersequence | Using LCS

Longest Increasing Subsequence using Dynamic Programming

Longest Bitonic Subsequence

Increasing Subsequence with Maximum Sum

The Levenshtein distance (Edit distance) problem

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

Matrix Chain Multiplication

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

Find longest sequence formed by adjacent numbers in the matrix

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

0-1 Knapsack problem

Maximize value of the expression

Partition problem

Subset sum problem

Minimum Sum Partition problem

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

Rod Cutting

Maximum Product Rod Cutting

Coin change-making problem (unlimited supply of coins)

Coin Change Problem – Find total number of ways to get the denomination of coins

Longest alternating subsequence

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

Collect maximum points in a matrix by satisfying given constraints

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

Find optimal cost to construct binary search tree

Word Break Problem

Wildcard Pattern Matching

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

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

Find maximum sum $K \times K$ sub-matrix in a given $M \times N$ matrix
Find maximum sum submatrix present in a given matrix
Find maximum sum of subsequence with no adjacent elements
Maximum subarray problem (Kadane's algorithm)
Single-Source Shortest Paths – Bellman Ford Algorithm
All-Pairs Shortest Paths – Floyd Warshall Algorithm

Graphs

Terminology and Representations of Graphs
Graph Implementation using STL
Graph Implementation in C++ without using STL
Breadth First Search (BFS) | Iterative & Recursive Implementation
Depth First Search (DFS) | Iterative & Recursive Implementation
Arrival and Departure Time of Vertices in DFS
Types of edges involved in DFS and relation between them
Bipartite Graph
Minimum number of throws required to win Snake and Ladder game
Topological Sorting in a DAG
Transitive Closure of a Graph
Check if an undirected graph contains cycle or not
Total number of paths in given digraph from given source to destination having exactly m edges
Determine if an undirected graph is a Tree (Acyclic Connected Graph)
2-Edge Connectivity in the graph
2-Vertex Connectivity in the graph
Check if given digraph is a DAG (Directed Acyclic Graph) or not
Disjoint-Set Data Structure (Union-Find Algorithm)
Chess Knight Problem – Find Shortest path from source to destination
Check if given Graph is Strongly Connected or not
Check if given Graph is Strongly Connected or not using one DFS Traversal
Union-Find Algorithm for Cycle Detection in undirected graph
Kruskal's Algorithm for finding Minimum Spanning Tree
Single-Source Shortest Paths – Dijkstra's Algorithm
Single-Source Shortest Paths – Bellman Ford Algorithm
All-Pairs Shortest Paths – Floyd Warshall Algorithm

Print all k-colorable configurations of the graph (Vertex coloring of graph)
Print All Hamiltonian Path present in a graph
Greedy coloring of graph

Heaps

Introduction to Priority Queues using Binary Heaps
Min Heap and Max Heap Implementation in C++
Heap Sort (Out-of-place and In-place implementation in C++ and C)
Check if given array represents min heap or not
Convert Max Heap to Min Heap in linear time
Find K'th largest element in an array
Sort a K-Sorted Array
Merge M sorted lists of variable length
Find K'th smallest element in an array
Find smallest range with at-least one element from each of the given lists
Merge M sorted lists each containing N elements

External merge sort
Huffman Coding
Find first k maximum occurring words in given set of strings
Find first k non-repeating characters in a string in single traversal

Linked Lists

Introduction to Linked Lists
Linked List Implementation | Part 1
Linked List Implementation | Part 2
Static Linked List in C
Clone given Linked List
Delete Linked List
Pop operation in linked list
Insert given node into the correct sorted position in the given sorted linked list
Given a linked list, change it to be in sorted order
Split the nodes of the given linked list into front and back halves
Remove duplicates from a sorted linked list

Move front node of the given list to the front of the another list
Rearrange the given list such that every even node will be moved to end of the list in reverse order
Split given linked list into two lists where each list containing alternating elements from it
Construct a linked list by merging alternate nodes of two given lists
Merge given sorted linked lists into one
Merge Sort for Singly Linked List
Intersection of two given sorted linked lists
Reverse linked list | Part 1 (Iterative Solution)
Reverse linked list | Part 2 (Recursive Solution)
Reverse every group of k nodes in given linked list
Find K'th node from the end in a linked list
Merge alternate nodes of two linked lists into the first list
Merge two sorted linked lists from their end
Delete every N nodes in a linked list after skipping M nodes
Rearrange linked list in specific manner in linear time
Check if linked list is palindrome or not
Move last node to front in a given Linked List
Rearrange the linked list in specific manner
Detect Cycle in a linked list (Floyd's Cycle Detection Algorithm)
Sort linked list containing 0's, 1's and 2's

Matrix

Print Matrix in Spiral Order
Create Spiral Matrix from given array
Shift all matrix elements by 1 in Spiral Order
Find Shortest path from source to destination in a matrix that satisfies given constraints
Change all elements of row i and column j in a matrix to 0 if cell (i, j) has value 0
Print diagonal elements of the matrix having positive slope
Find all paths from first cell to last cell of a matrix
Replace all occurrences of 0 that are not surrounded by 1 in a binary matrix
In-place rotate the matrix by 90 degrees in clock-wise direction
Count negative elements present in sorted matrix in linear time
Report all occurrences of an element in row wise and column wise sorted matrix in linear time
Calculate sum of all elements in a sub-matrix in constant time
Find maximum sum K x K sub-matrix in a given M x N matrix
Find maximum sum submatrix present in a given matrix
Find probability that a person is alive after taking N steps on the island

Count the number of islands
Flood fill Algorithm
Find shortest safe route in a field with sensors present
Find all occurrences of given string in a character matrix
Lee algorithm | Shortest path in a Maze

Travelling Salesman Problem using Branch and Bound
Collect maximum points in a matrix by satisfying given constraints
Count number of paths in a matrix with given cost to reach destination cell
Find longest sequence formed by adjacent numbers in the matrix
Find the minimum cost to reach last cell of the matrix from its first cell
Matrix Chain Multiplication
Find size of largest square sub-matrix of 1's present in given binary matrix
Chess Knight Problem – Find Shortest path from source to destination
Find Duplicate rows in a binary matrix
Print all possible solutions to N Queens problem
Print all Possible Knight's Tours in a chessboard
Find Shortest Path in Maze
Find Longest Possible Route in a Matrix

Queue

Chess Knight Problem – Find Shortest path from source to destination
Lee algorithm | Shortest path in a Maze
Find shortest safe route in a field with sensors present
Flood fill Algorithm
Count the number of islands
Find Shortest path from source to destination in a matrix that satisfies given constraints
Generate binary numbers between 1 to N
Calculate height of a binary tree | Iterative & Recursive
Delete given Binary Tree | Iterative & Recursive
Level Order Traversal of Binary Tree
Spiral Order Traversal of Binary Tree
Reverse Level Order Traversal of Binary Tree
Print all nodes of a given binary tree in specific order
Print left view of binary tree
Find next node in same level for given node in a binary tree
Check if given binary tree is complete binary tree or not

Print Diagonal Traversal of Binary Tree
Print corner nodes of every level in binary tree
Breadth First Search (BFS) | Iterative & Recursive Implementation
Minimum number of throws required to win Snake and Ladder game
Check if an undirected graph contains cycle or not

Sorting

Insertion sort | Iterative & Recursive
Selection sort | Iterative & Recursive
Bubble sort | Iterative & Recursive
Merge Sort
Quicksort
Iterative Implementation of Quicksort
Hybrid QuickSort
Quicksort using Dutch National Flag Algorithm
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Custom Sort | Sort elements by their frequency and Index
Custom Sort | Sort elements of the array by order of elements defined by the second array
Inversion Count of an array
Segregate positive and negative integers in linear time
Sort linked list containing 0's, 1's and 2's

Find the smallest window in array sorting which will make the entire array sorted
Find largest number possible from set of given numbers
Move all zeros present in the array to the end
Sort linked list containing 0's, 1's and 2's
Sort binary array in linear time
Merge Sort for Singly Linked List
Group anagrams together from given list of words
Activity Selection Problem
Lexicographic sorting of given set of keys
Heap Sort (Out-of-place and In-place implementation in C++ and C)
Merge M sorted lists of variable length
Merge M sorted lists each containing N elements
Find all palindromic permutations of a string
Find all lexicographically next permutations of a string sorted in ascending order
Merge two sorted linked lists from their end

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

Find pair with given sum in the array

Inplace merge two sorted arrays

Merge two arrays by satisfying given constraints

Find maximum product of two integers in an array

Find all distinct combinations of given length

Find all distinct combinations of given length with repetition allowed

Merging Overlapping Intervals

Stack

Check if given expression is balanced expression or not

Find duplicate parenthesis in an expression

Evaluate given postfix expression

Decode the given sequence to construct minimum number without repeated digits

Inorder Tree Traversal | Iterative & Recursive

Preorder Tree Traversal | Iterative & Recursive

Postorder Tree Traversal | Iterative & Recursive

Find ancestors of given node in a Binary Tree

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

Reverse given text without reversing the individual words

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

Iterative Implementation of Quicksort

Depth First Search (DFS) | Iterative & Recursive Implementation

String

Check if given set of moves is circular or not

Check if given string is a rotated palindrome or not

Longest Palindromic Substring (Non-DP Space Optimized Solution)

Check if repeated subsequence is present in the string or not

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

Convert given number into corresponding excel column name

Determine if two strings are anagram or not

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

Find all interleavings of given strings

Isomorphic Strings

Find all possible palindromic substrings in a string

Find all possible combinations of words formed from mobile keypad

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

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

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

Group anagrams together from given list of words

Introduction to Pattern Matching

Inplace remove all occurrences of 'AB' and 'C' from the string

Longest even length palindromic substring

Print string in zig-zag form in k rows

Reverse given text without reversing the individual words

Run Length Encoding (RLE) data compression algorithm

Validate an IP address

Find the longest substring of given string containing k distinct characters

Find all palindromic permutations of a string

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

Find the longest substring of given string containing all distinct characters

Find all Permutations of a given string

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

Find Lexicographically minimal string rotation

Find all strings of given length containing balanced parentheses

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

Generate binary numbers between 1 to N

Find all combinations of non-overlapping substrings of a string

Check if given sentence is syntactically correct or not

Calculate rank of given string among all its lexicographically sorted permutations

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

Combinations of words formed by replacing given numbers with corresponding English alphabets

Word Break Problem

Wildcard Pattern Matching

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

The Levenshtein distance (Edit distance) problem

Longest Common Subsequence | Introduction & LCS Length

Longest Common Subsequence | Space optimized version

Longest Common Subsequence | Finding all LCS

Longest Common Subsequence of K-sequences
Longest Repeated Subsequence problem
Longest Palindromic Subsequence using Dynamic Programming
Longest Common Substring problem
Shortest Common Supersequence | Introduction & SCS Length
Shortest Common Supersequence | Finding all SCS
Shortest Common Supersequence | Using LCS

Trie

Trie Implementation | Insert, Search and Delete
Memory efficient Trie Implementation using Map | Insert, Search and Delete
Longest Common Prefix in given set of strings (using Trie)
Lexicographic sorting of given set of keys
Find maximum occurring word in given set of strings
Find first k maximum occurring words in given set of strings
Find Duplicate rows in a binary matrix

Greedy

Activity Selection Problem
Huffman Coding
Shortest Superstring Problem
Job Sequencing Problem with Deadlines
Greedy coloring of graph

Puzzles

Clock angle problem – Find ? between hour and minute hand
Add two numbers without using addition operator | 4 methods
Generate power set of a given set
Implement power function without using multiplication and division operators
Print all numbers between 1 to N without using semicolon

Swap two numbers without using third variable | 5 methods

Determine the if condition to print specific output

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

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

Print "Hello World" with empty main() function | 3 methods

Tower of Hanoi Problem

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

Print a semicolon without using semicolon anywhere in the program

Multiply two numbers without using multiplication operator or loops

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

Magnet Puzzle

Thank you all for your valuable time and being with us.