

Algorithms

Analysis of Algorithms: Asymptotic Analysis, Worst, Average and Best Cases, Asymptotic Notations, Analysis of Loops, Solving Recurrences, What does 'Space Complexity' mean?, NP-Completeness Introduction, A Time Complexity Question, Time Complexity of building a heap, Quiz on Analysis of Algorithms, Quiz on Recurrences

Searching and Sorting: Binary Search, Selection Sort, Bubble Sort, Insertion Sort, Merge Sort, Heap Sort, QuickSort, Bucket Sort, Interpolation search vs Binary search, Stability in sorting algorithms, When does the worst case of Quicksort occur?, Lower bound for comparison based sorting algorithms. Which sorting algorithm makes minimum number of memory writes?, Find the Minimum length Unsorted Subarray, sorting which makes the complete array sorted, Merge Sort for Linked Lists, Sort a nearly sorted (or K sorted) array, Iterative Quick Sort, QuickSort on Singly Linked List, QuickSort on Doubly Linked List, Sort n numbers in range from 0 to $n^2 - 1$ in linear time, Quiz on Sorting, Quiz on Searching

Greedy Algorithms: Activity Selection Problem, Kruskal's Minimum Spanning Tree Algorithm, Huffman Coding, Efficient Huffman Coding for Sorted Input, Prim's Minimum Spanning Tree Algorithm, Prim's MST for Adjacency List Representation, Dijkstra's Shortest Path Algorithm, Dijkstra's Algorithm for Adjacency List Representation, Quiz on Greedy Algorithms

Dynamic Programming: Overlapping Subproblems Property, Optimal Substructure Property, Longest Increasing Subsequence, Longest Common Subsequence, Edit Distance, Min Cost Path, Coin Change, Matrix Chain Multiplication, Binomial Coefficient, 0-1 Knapsack Problem, Egg Dropping Puzzle, Longest Palindromic Subsequence, Cutting a Rod, Maximum Sum Increasing Subsequence, Longest Bitonic Subsequence, Floyd Warshall Algorithm, Palindrome Partitioning, Partition problem, Word Wrap Problem, Maximum Length Chain of Pairs, Variations of LIS, Box Stacking Problem, Program for Fibonacci numbers, Minimum number of jumps to

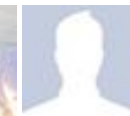
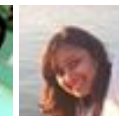
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Lowest Common Ancestor in a BST.

Check if a binary tree is BST or not

Sorted Linked List to Balanced BST

reach end, Maximum size square sub-matrix with all 1s, Ugly Numbers, Largest Sum Contiguous Subarray, Longest Palindromic Substring, Bellman–Ford Algorithm for Shortest Paths, Optimal Binary Search Tree, Largest Independent Set Problem, Subset Sum Problem, Maximum sum rectangle in a 2D matrix. See Dynamic Programming Tag for more problems, Quiz on Dynamic Programming

Pattern Searching: Naive Pattern Searching, KMP Algorithm, Rabin-Karp Algorithm, A Naive Pattern Searching Question, Finite Automata, Efficient Construction of Finite Automata, Boyer Moore Algorithm – Bad Character Heuristic, Suffix Array,

Backtracking: Print all permutations of a given string, The Knight's tour problem, Rat in a Maze, N Queen Problem, Subset Sum, m Coloring Problem, Hamiltonian Cycle, Sudoku, Tug of War, Solving Cryptarithmic Puzzles

Divide and Conquer: Introduction, Write your own pow(x, n) to calculate x^n , Median of two sorted arrays, Count Inversions, Closest Pair of Points, Strassen's Matrix Multiplication, See this for more, Quiz on Divide and Conquer

Geometric Algorithms: Closest Pair of Points | $O(n \log n)$ Implementation, How to check if two given line segments intersect?, How to check if a given point lies inside or outside a polygon?, Convex Hull | Set 1 (Jarvis's Algorithm or Wrapping), Convex Hull | Set 2 (Graham Scan), Given n line segments, find if any two segments intersect, Check whether a given point lies inside a triangle or not

Mathematical Algorithms: Write an Efficient Method to Check if a Number is Multiple of 3, Efficient way to multiply with 7, Write a C program to print all permutations of a given string, Lucky Numbers, Write a program to add two numbers in base 14, Babylonian method for square root, Multiply two integers without using multiplication, division and bitwise operators, and no loops, Print all combinations of points that can compose a given number, Write your own Power without using multiplication(*) and division(/) operators, Program for Fibonacci numbers, Average of a stream of numbers, Count numbers that don't contain 3, Magic Square, Sieve of Eratosthenes, Find day of the week for a given date, DFA based division, Generate integer from 1 to 7 with equal probability, Given a number, find the next smallest palindrome, Make a fair coin from a biased coin, Check divisibility by 7, Find the largest multiple of 3, Lexicographic rank of a string, Print all permutations in sorted (lexicographic) order, Shuffle a given array, Space and time efficient Binomial Coefficient, Reservoir Sampling. Pascal's Triangle. Select a random number from stream. with $O(1)$ space. Find

Sampling, [Find a square triangle](#), [Select a random number from stream, with \$O\(1\)\$ space](#), [Find the largest multiple of 2, 3 and 5](#), [Efficient program to calculate \$e^x\$](#) , [Measure one litre using two vessels and infinite water supply](#), [Efficient program to print all prime factors of a given number](#), [Print all possible combinations of r elements in a given array of size n](#), [Random number generator in arbitrary probability distribution fashion](#), [How to check if a given number is Fibonacci number?](#), [Russian Peasant Multiplication](#), [Count all possible groups of size 2 or 3 that have sum as multiple of 3](#)

Bit Algorithms: [Find the element that appears once](#), [Detect opposite signs](#), [Set bits in all numbers from 1 to n](#), [Swap bits](#), [Add two numbers](#), [Smallest of three](#), [A Boolean Array Puzzle](#), [Set bits in an \(big\) array](#), [Next higher number with same number of set bits](#), [Optimization Technique \(Modulus\)](#), [Add 1 to a number](#), [Multiply with 3.5](#), [Turn off the rightmost set bit](#), [Check for Power of 4](#), [Absolute value \(abs\) without branching](#), [Modulus division by a power-of-2-number](#), [Minimum or Maximum of two integers](#), [Rotate bits](#), [Find the two non-repeating elements in an array](#), [Number Occurring Odd Number of Times](#), [Check for Integer Overflow](#), [Little and Big Endian](#), [Reverse Bits of a Number](#), [Count set bits in an integer](#), [Number of bits to be flipped to convert A to B](#), [Next Power of 2](#), [Check if a Number is Multiple of 3](#), [Find parity](#), [Multiply with 7](#), [Find whether a no is power of two](#), [Position of rightmost set bit](#), [Binary representation of a given number](#), [Swap all odd and even bits](#), [Find position of the only set bit](#), [Karatsuba algorithm for fast multiplication](#), [How to swap two numbers without using a temporary variable?](#), [Check if a number is multiple of 9 using bitwise operators](#), [Quiz on Bit Algorithms](#).

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