Practice for cracking any coding interview

Coding questions in this article are **difficulty wise ordered**. The idea of this post is to target two types of people.

1. **Competitive Programming Preparation (For Ist and IInd Year Students) :** It is recommended to finish all questions from all categories except possibly Linked List, Tree and BST. However at least 10 questions from these categories should also be covered. If you have never done competitive programming before, it is strongly recommended to see How to Begin with Competitive Programming first. If you wish to get yourself prepared with a language first, you may first begin C++ Track or Java Track
2. **Interview preparation** It is recommended to cover all topics. In every every topic, you can start from questions according to your comfort level.

The practice system tells you exactly the test case where your code failed. In case you need more clarity about a question, you may use expected output button to see output for your given input. You can also view successful submissions of others in case you are stuck. **To see solution of others**, please click “All Submissions” button at the bottom of problem statement.

Topics :

- Mathematical
- Puzzles
- Arrays
- String
- Searching
- Sorting
- Hashing
- Matrix
- Recursion
- Divide & Conquer
- Linked List
- Doubly and Circular Linked Lists
- Stack
- Queue
- Prefix Sum and Sliding Window
- Bit Magic
- Tree
- Binary Search Tree
- Heap
- Graph
- Greedy Algorithms
- Dynamic Programming
- Backtracking
- Trie
- Misc Topics
- Important Links

Mathematical :

1. Print the pattern (You only need to write function here)
2. Print table (This is a full code problem. Please see sample codes here before attempting the problem)
3. Series AP
4. Series GP
5. Closest Number
6. Armstrong Numbers
7. Sum of digits of a number
8. Reverse digits
9. Print the Kth Digit
10. Binary number to decimal number
11. Jumping Numbers
12. GCD of two numbers
13. LCM of two numbers
14. Add two fractions
15. GCD of array
16. Factorial of a number
17. Compute nPr
18. Compute nCr
19. Largest prime factor
20. Perfect Numbers
21. Pair cube count
22. Find Nth root of M
23. Prime Number
24. Sieve of Eratosthenes
25. Sum of all prime numbers between 1 and N.
26. Pairs of prime numbers

Related Learning Resources : Mathematical Algorithms and Number Theory

Puzzles

1. Count Squares
2. 3 Divisors
3. Check if four points form a square
4. Check for power
5. Overlapping rectangles
6. Trailing zeroes in factorial
7. Angle between hour and minute hand

8. Number Of Open Doors
9. Triangular Numbers
10. Nth Even Fibonacci Number
11. Last two digit Fibonacci
12. Squares in a Matrix
13. Day of the week

Related Learning Resources : Puzzles

Arrays :

1. Array operations (Search, insert, delete)
2. Array alternate printing
3. Maximum and minimum in an array
4. Second largest in array
5. Sum of array elements
6. Reverse an Array
7. Rotate Array
8. Count of smaller elements
9. Remove duplicate elements from sorted Array
10. Count possible triangles
11. Leaders in an array
12. Minimum distance between two numbers
13. Sorted subsequence of size 3
14. Maximum Sub Array
15. Majority Element
16. Wave Array
17. Maximum Index
18. Max sum path in two arrays
19. Product array puzzle
20. Find duplicates in a small ranged array
21. Find Missing And Repeating
22. Stock buy and sell
23. Trapping Rain Water
24. Pair with given sum in a sorted array
25. Chocolate Distribution Problem
26. Longest Consecutive subsequence
27. Three way partitioning

Related Learning Resources : Array Data Structure

String :

1. Check for palindrome
2. Check for anagram
3. Anagram Palindrome
4. Title case conversion
5. Sort the string
6. Merge two strings
7. Save Ironman
8. Good or Bad string
9. URLify a given string
10. Extract Maximum
11. Reverse words in a given string
12. Implement strstr
13. Check for subsequence
14. Check for rotation
15. Check if two strings are k-anagrams
16. Uncommon characters
17. Anagram Search
18. First repeating character
19. First non-repeating character
20. Longest Distinct characters in string
21. Longest Palindromic Substring
22. Find k-th character in string
23. Smallest window in a string containing all characters of another string
24. Add Binary Strings
25. Multiply two Strings
26. Nearest multiple of 10

Related Learning Resources : String Data Structure

Searching :

1. Linear Search
2. Facing the sun
3. Magnet Array Problem
4. Binary Search
5. Floor in a Sorted Array

6. Count occurrences in a sorted array
7. Search in a sorted and rotated
8. Find the missing number
9. Missing element of AP
10. Square root of a number
11. Find Transition Point in a Sorted Binary Array
12. Last index of One
13. Peak element
14. Allocate minimum number of pages
15. Common elements in three sorted
16. Smallest Positive missing number

Related Learning Resources : Searching Algorithms

Sorting :

1. Check if array is sorted
2. Sort a binary array
3. Sort an array of 0s, 1s and 2s
4. Bubble Sort
5. Insertion Sort
6. Selection Sort
7. Quick Sort
8. Merge Sort
9. Sort an array when two halves are sorted
10. Relative Sorting
11. Triplet Sum in Array
12. Minimum Swaps to Sort
13. Sorting elements by frequency
14. Triplet Family
15. Count the triplets

Related Learning Resources : Sorting Algorithms

Hashing :

1. Count distinct elements
2. Array Subset of another array
3. Nuts and Bolts Problem
4. Count frequencies of elements

5. Check if two arrays are equal or not
6. First element to occur k times
7. In First But Second
8. Non-Repeating Element
9. Group Anagrams Together
10. Winner of an election
11. Check for a pair with given sum
12. Count distinct pairs with difference k
13. Count pairs with given sum
14. Find all four sum numbers
15. A Simple Fraction
16. Largest Fibonacci Subsequence

Related Learning Resources : Hashing Data Structure

Matrix :

1. Transpose of Matrix
2. Print Matrix in snake Pattern
3. Print a given matrix in spiral form
4. Is Sudoku Valid
5. Count zeros in a sorted matrix
6. Squares in a Matrix
7. A Boolean Matrix Question
8. Search in row-wise and column-wise sorted
9. Find the row with maximum number of 1s
10. Count pairs Sum in matrices
11. Median In a Row-Wise sorted Matrix

Related Learning Resources : Matrix Data Structure

Recursion :

1. Print Pattern
2. Handshakes
3. Tower of Hanoi
4. Josephus problem
5. Recursively remove all adjacent duplicates
6. Possible words from Phone digits
7. Flood fill Algorithm

8. Permutations of a string

Related Learning Resources : Recursion

Divide & Conquer :

1. Write your own power function
2. Program for n-th Fibonacci Number
3. K-th element of two sorted Arrays
4. Median of two sorted arrays
5. Karatsuba Algorithm
6. The Painter's Partition Problem
7. Convex Hull
8. Counting inversions

Related Learning Resources : Divide and Conquer Algorithms

Linked List :

1. Print a Linked List
2. Length of a linked list
3. Node at a given index in linked list
4. Middle of a linked list
5. n-th node from end of a linked list
6. Delete a node
7. Remove every k'th node
8. Delete N nodes after M nodes of a linked list
9. Delete without head pointer
10. Rearrange a linked list
11. Segregate even and odd (Using only one traversal)
12. Reorder List
13. Polynomial Addition
14. Insert in a Sorted List
15. Swap nodes in pairs
16. Reverse a linked list
17. Reverse a Linked List in groups of given size.
18. Check for palindrome
19. Flattening a linked list
20. Get intersection point
21. Remove duplicates from sorted list

22. Remove duplicates from unsorted lists
23. Sort a linked list of 0s, 1s and 2s.
24. Circular Linked List
25. Detect loop in a linked list
26. Find length of Loop
27. Remove loop in a linked list
28. Add two numbers represented by linked lists
29. Clone a linked list with random pointers
30. Add 1 to a number represented as linked list
31. Add two numbers represented as linked list
32. Multiply two linked lists
33. Merge two sorted linked lists
34. Merge Sort on Linked List
35. Intersection of Two Linked Lists
36. Union of Two Linked Lists

Related Learning Resources : Linked List Data Structure

Doubly and Circular Linked Lists

1. Insert a node in Doubly linked list
2. Delete node in Doubly Linked List
3. Circular Linked List Traversal
4. Split a Circular Linked List into two halves
5. Insert in Sorted way in a Sorted DLL
6. QuickSort on Doubly Linked List
7. Merge Sort on Doubly Linked List
8. Rotate doubly Linked List by P nodes
9. XOR Linked List

Related Learning Resources : Doubly Linked List and Circular Linked List.

Stack

1. Implement Stack using Array
2. Implement Stack using Linked List
3. Check for balanced parenthesis
4. Reverse a stack
5. Implement two stacks in an array
6. Design a stack with getMin

7. The celebrity problem
8. Stock Span Problem
9. Next Greater Element
10. Next Smaller Element
11. Longest valid Parentheses

Related Learning Resources : Stack Data Structure

Queue and Dequeue

1. Implement Queue using Linked List
2. Implement Queue using Array
3. Implement Stack using Queue
4. Implement Queue using Stack
5. Reversing a Queue
6. Circular tour

Related Learning Resources : Queue Data Structure

- First non-repeating character in a stream

Prefix Sum and Sliding Window

1. Equilibrium Point
2. Check if there is a subarray with 0 sun
3. Longest Sub-Array with Sum K
4. Longest subarray with sum divisible by K
5. Largest subarray with equal 1s and 0s
6. Longest common span with same number of 1s and 0s among two arrays
7. Find mximum sum in any subarray of size k
8. Count distinct elements in every window of size k
9. Check for subarray with given sum

Related Learning Resources : Prefix Sum and Sliding Window

Bit Magic

1. Check if a number is even or odd.
2. Number of bit flips
3. Game of XOR
4. Find bit at a position
5. Swap odd and even bits

6. Power of 2
7. Odd occurring element
8. Missing number in array
9. Index Of an Extra Element
10. Reverse Bits
11. Count set bits
12. Power Set

Related Learning Resources : Bit Magic

Tree

1. Inorder Traversal
2. Preorder Traversal
3. Postorder Traversal
4. Level order traversal
5. Find height of Binary Tree
6. Count Leaves in Binary Tree
7. Check for Children Sum Property
8. Mirror Tree
9. Check for Balanced Tree
10. Lowest Common Ancestor in a Binary Tree
11. Diameter of Binary Tree
12. Left View of Binary Tree
13. Right View of Binary Tree
14. Maximum path sum
15. Level order traversal line by line
16. Tree from Postorder and Inorder
17. Tree from Preorder and Inorder
18. Connect Nodes at Same Level
19. Zig-Zag level order traversal
20. Serialize and Deserialize a Binary Tree
21. Leaves to DLL
22. Binary Tree to Doubly Linked List
23. Binary Tree to Circular Doubly Linked List

Related Learning Resources : Tree Data Structure

Binary Search Tree

1. BST Search
2. BST Insert
3. BST Delete
4. Minimum in BST
5. Inorder Traversal and BST
6. Count BST nodes that lie in a given range
7. Add all greater values
8. Predecessor and Successor in BST
9. Closest Neighbor in BST
10. Lowest Common Ancestor in a BST
11. Convert Level Order Traversal to BST
12. Normal BST to Balanced BST
13. Pair with given sum in BST
14. Check for BST
15. Correct BST with two nodes swapped
16. Median of BST
17. k-th smallest element in BST
18. Unique BST's
19. Array to BST
20. Preorder Traversal and BST
21. Preorder to Postorder
22. Leaf nodes from preorder traversal
23. Triplet with 0 sum in BST
24. Merge two BST 's
25. Largest BST Subtree

Related Learning Resources : Binary Search Tree

Heap

1. Binary Heap Operations
2. Height of Heap
3. Heap Sort
4. Sort a Nearly Sorted Array
5. K Largest Elements
6. K-th largest element in a stream
7. Median of stream
8. Merge k sorted arrays

Related Learning Resources : Heap Data Structure

Graph

1. Print adjacency list
2. Breadth First Search
3. Depth First Search
4. Find whether path exist
5. Knight Walk
6. Snake and Ladder Problem
7. Bipartite Graph
8. Detect Cycle in an undirected graph
9. Detect Cycle in a directed graph
10. Find first n numbers with given set of digits
11. Rotten oranges
12. Topological sort
13. Shortest Source to Destination Path
14. Transitive closure of a Graph
15. Strongly Connected Components

Related Learning Resources : Graph Data Structure

Greedy Algorithms

1. Fractional Knapsack
2. Largest number with given sum
3. Activity Selection
4. N meetings in one room
5. Minimum Platforms
6. Minimum number of Coins
7. Job Sequencing Problem
8. Minimize the heights
9. Huffman Coding
10. Huffman Decoding
11. Minimum Spanning Tree
12. Dijkstra for Adjacency Matrix

Related Learning Resources : Greedy Algorithms

Dynamic Programming

1. Print first n Fibonacci Numbers.
2. Count ways to reach the n'th stair
3. Cutted Segments
4. Kadane's Algorithm
5. Stickler Thief
6. Minimum number of jumps
7. Total Decoding Messages
8. Min Cost Path
9. Coin Change
10. Longest Common Subsequence
11. Consecutive 1's not allowed
12. Edit Distance
13. Rod Cutting
14. Water Overflow
15. Maximum Tip Calculator
16. Longest Increasing Subsequence
17. Maximum sum increasing subsequence
18. Max length chain
19. 0 – 1 Knapsack Problem
20. Maximum Tip Calculator
21. Interleaved string
22. Longest Palindromic Subsequence
23. Wildcard Pattern Matching
24. Box Stacking
25. Longest Bitonic subsequence
26. Minimum sum partition
27. Largest square formed in a matrix
28. Word Break
29. Matrix Chain Multiplication
30. Special Keyboard
31. Egg Dropping Puzzle
32. Optimal Strategy for a Game

Related Learning Resources : Dynamic Programming

Backtracking

1. Rat Maze With Multiple Jumps
2. Coins and Game
3. Hamiltonian Path
4. Solve the Sudoku
5. Combination Sum – Part 2

6. Combination Sum
7. Subsets
8. Largest number in K swaps
9. M-Coloring Problem
10. Black and White

Related Learning Resources : Backtracking

Trie

1. Trie Search and Insert
2. Trie Delete
3. Unique rows in a binary matrix
4. Count of distinct substrings
5. Word Boggle

Related Learning Resources : Trie Data Structure

Misc Questions to test your overall learning

1. Longest common prefix
2. Implement Atoi
3. Two numbers with sum closest to zero
4. Smallest greater elements in whole array
5. Max rectangle
6. Find triplets with zero sum
7. Counting elements in two arrays
8. Merge K sorted linked lists
9. Maximum Difference
10. Circle of strings
11. All possible Word Breaks
12. Alien Dictionary
13. Design a tiny URL or URL shortener
14. Implement LRU Cache

Important Links :

1. Sudo Placement : For companies like Amazon, Microsoft, Adobe, .., etc
2. Sudo Placement 2 : For companies like TCS, Infosys, Wipro, Cognizant, .. etc

3. Aptitude questions asked in round 1 : Placements Course designed for this purpose.
4. MCQs asked from different computer science subjects : Subject-Wise Quizzes
5. Interview theory and coding questions of all companies : Company wise all practice questions.
6. Interview experiences of all companies : Interview corner.
7. Must Do Coding Questions for Companies like Amazon, Microsoft, Adobe, …
8. Must Do Coding Questions Company-wise

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51

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