

No care for rating -

- ↳ A20J ladders (practice)
- ↳ spoj, Codeforces & HackerEarth.
- ↳ Alternate days to practice and learn new concepts

Practicing sequence :-

- printing problems
- time complexity
- Linear Search & implementing using Circular array
- Palindrome & other nos.
- Simple hashing problems
- Prefix sum problems, both 1D & 2D
- Sliding window technique
- Binary search
- GCD of two nos. in Logn (Euclidean & Extended Euclidean algo.)
- Checking prime
- Sieving of Eratosthenes
- Segmented sieve
- Finding the prime factorization of a no. in Logn/guy
- Euler Totient function
- Fermat Little Theorem
- Wilson's theorem

- Finding $x^n \text{ mod } m$
- Modular arithmetic
- Modular Inverse of a no.
- Chinese Remainder Theorem
- Factorial modulo mod
- Finding nCr and nPr for Queries
- Inclusion Exclusion Principle →

[Combinatorics : Hackerearth
x NO DP x Codeforces]

- Basic sorting algo.
 - 2-pointer approach
 - Bit Manipulation (Left shift, RS, set bit, MSB, LSB)
 - Power set of a given array or a string using BIT
 - No. of subarrays with XOR as zero.
 - Problems related to greedy algo.
 - Kadane's algo.
 - Job sequencing & Activity Selection problem
- [Codeforces : tag : greedy]

Bit manipulation

Greedy

Recursion : [LeetCode or GFG's practice]

- Factorial
- Binary search
- Modular exponentiation

Merge Sort & Quick Sort
Related problems.

Backtracking problems :

Sudoku
N Queen

Meet in Middle Algorithms → Problems .
Divide & Conquer Problems [codeforces]

Next-greater Element / next smaller element -
using stack

Problems related to parenthesis

Largest Rectangular area in histogram

(Concept - is used in a lot of problems)

Heap (Priority Queue) - Problems

① Don't compare yourself .. Everyone has his/her own
space so ↑ focus on learning &
practicing , rest will follow automatically .

String algorithms :-

- Rabin Karp Algorithm
- Prefix Func
- KMP Algo.
- Z-inversion
- Manacher's Algo.
- Practice on above (15 - 20 each)

Tree / Graph Algos:-

- Representation
- DFS / BFS
- * • Diameter of Tree
- * • Euler Tour of Tree
- Finding LCA (lowest common ancestor) [Euler Tour]
- .. " using Binary lifting
- Dist. b/w two nodes
- Subtree Problems
- Practice on above (spoj & codeforces)

Graph Algo :-

- Connected components
- Topological sort
- Cycle detection
- Bipartite Check
- SCC using Kosaraju's Algo.
- Dijkstra's Algo.
- Bellman Ford & Floyd Warshall algo.
- Practice on above (spoj & codeforces)
Blogs on Hackerearth & CP algo.

- Bridges in Graph
- Articular Point in graph
- Minimum Spanning tree using Kruskal's
- Prim's algo.
- 0/1 BFS
- Finding bridges online
- Solve problems

Dynamic Programming :-

- No iterative DP
 - Recursion
 - Memoization
 - LCS, Knapsack etc.
 - (At Coder for practice)
- (Solve from SPOT)

- Understand how do we write recurrence for Digit DP (CF blog)
- Solve a bunch of problem on it.
- DP with Bitmasks (Problems prav).
- DP on trees
- SOS DP

[Practice a lot]

Disjoint Set - (using all optimizations)

- offline queries using Disj. set -
- Kruskal's Algo.
- (Problems on above)
- Sparse Table
- Fenwick Tree . (also range update tree)
- Binary Lifting on Fenwick Tree .
- (Problems on above [SPOJ & Codeforces])

• Matrix Exponentiation

• Sqrt Decomposition Technique

• Update & Query Ops

• Mo's algo. [Codeforces]

• Mo's algo. on trees.

Segment Trees [EVVI]

(Range Queries & Point updates)

• Lazy propagation on segment trees.

Advance

Bank of all algos.

• Sprague - Grundy Theorem . (Gaurav Sen)

• Flows & Related Problems

• Heavy light-decomposition (Anudeep)

• Convex Hull Algo-

• FFT / NTT