CP Course

DAY 1 : Strategies

Class topics:

1. Brief discussion about our course
2. Our recommendations
3. Codeforces
4. BDOI / IOI

Contest topic: Implementation of STL functions (2 Days)

DAY 2 : Sorting and Searching

Class topics:

1. Complexity Analysis
2. Sorting Algorithms
3. Prefix Sum
4. Binary Search

Contest topic: Prefix sum & Binary Search (2 Days)

DAY 3 : Number Theory

Class topic:

1. Factorization and Divisibility
2. Modular Arithmetic and advanced uses of it
3. Sieve

Contest topic: Basic Number Theory (2 Days)

DAY 4 : Greedy Algorithms and Bruteforce Approach

Class topics:

1. Greedy Algorithms
2. Bruteforce
3. Well-known problems

Contest topic: Bruteforce & Greedy (2 Days)

DAY 5 : Bitwise Operations

Class topics:

1. Base conversion
2. OR, AND & XOR
3. Classic Problems

Contest topic: Bit (2 Days)

DAY 6 : Indroductionary Graph Theory

Class topics:

1. Graph properties
2. Trees
3. DFS
4. BFS
5. Dijkstra's Algorithm

Contest topic: Basic graph (4 Days)

DAY 7 : Introduction to Dynamic Programming

Class topics:

1. Introduction of Dynamic Programming
2. Fibonacci
3. Coin Change/Knapsack
4. Longest Increasing Subsequence
5. Longest Common Subsequence

Contest topic: DP (2 Days)

DAY 8: Disjoint set union

Class topics:

1. Disjoint set union
2. DSU with rollback
3. Kruskal's Algorithm

Contest topic: DSU (2 Days)

DAY 9 : Tree

Class topics:

1. Diameter
2. Euler Tour
3. Binary Lifting
4. Lowest Common Ancestor

Contest topic: Class topics (2 Days)

DAY 10: Misc Topics

Class topics:

1. Two pointers
2. Line sweep
3. Sliding Window
4. Minimum Subarray Sum
5. Nearest smaller element

Contest Topic: Misc

DAY 11: SEGMENT TREE (1)

Class topic:

1. Segment tree intro

Contest topic: Basic Segment Tree (1 Day)

DAY 12: SEGMENT TREE (2)

Class topic:

1. Segment tree modifications
2. Uses of RMQ and Range Sum
3. K-th 1 and …

Contest topic: Classic Segment Tree Problems (2 Days)

DAY 13: SEGMENT TREE WITH LAZY PROPAGATION

Class topic:

1. Lazy Propagation

2. Classic problems

Contest topic: Classic Lazy Propagation Problems (3 Days)

DAY 14: Advance DP

Class topic:

1. Bitmask DP
2. Tree DP
3. Memory Optimization Techniques
4. Classical DP Problems

Contest topic: Advance DP (3 Days)

DAY 15 : Sqrt Decomposition

Class Topic:

1. Introduction to Sqrt Decomposition
2. Mo’s Algorithm

Contest topic: Sqrt Decomposition (2 Days)

DAY 16 : Goodbye

1. How to continue from here…