Competitive Coding Topics

- **Introduction to C++ -** Input/Output, Variables and Overflows, Pointers, Conditionals, Loops.
- Arrays, String, Functions, Modular Arithmetics.
- Time Complexity, Types of Errors.
- Pre-Computation, Hashing
- **STL -** Vectors, Pairs, Iterators, Maps (Ordered and Unordered), Sets (Ordered and Unordered), Multimaps, Multisets, STL nesting.
- **STL Functions -** upper bound, lower bound, sort, max, min, accumulate, reverse, count, find, next_permutations, prev_permutations.
- Recursion & Backtracking
- **Sorting -** Selection, Insertion, Bubble, Merge, Quick, Radix.
- Binary Search & its applications.
- **Number Theory -** Primes, Binary Exponentiation, Modulo Inverse, GCD, Euler Function, Euler Totient Function, Extended Euclid Function, Sieve of Eratosthenes, Divisors, Bit Manipulation, Bit Masking, Subset Generation.
- Stack, Queue, Linked List.
- Binary Trees & Binary Search Tree
- **Graph -** Introduction, Basic Algorithms, BFS, DFS, Cycle Detection, Bipartite Graphs.
- **Minimum Spanning Trees -** Prim's Algorithm, Dijkstra Algorithm, Kruskal Algorithm, KMP, Rabin-karp, Z-Algorithm.
- Lowest Common Ancestor, Binary Lifting, Strongly Connected Components
- Topological Sort, Articulation Points, Bridges in Graph, Merge Sort Tree.
- Dynamic Programming - Knapsack (0-1, bounded & unbounded) & variations, Fibonacci, Longest Common Subsequence, Longest Increasing Subsequence, Kadane's Algorithm, Matrix Chain Multiplication, DP on Trees, DP on Graphs, etc.
- Segment Trees, Range Update & Lazy Propagation, Fenwick Tree