\_Sergeant Category Syllabus\_

Duration: 4 Months class + Track sheet activity and guidance till semester ends.

Prerequisite: This category is for those who are familiar with various online judges or are trying to solve 900-1000 rated Codeforces problems.

Registration fees: 1000/= BDT

Registration Link: https://forms.gle/TfdDcYpkZwu255p28

**Syllabus:**

Session 1: Introduction to Competitive Programming

* Renown Judges For Practice
* Introduction Junior Training Sheet & Ladder
* Contest & Thinking Strategy & Self Motivation
* Time and Space Complexity

Session 2: STL - I

* Pair
* Vector and Its Application
* String and It’s Application
* Sorting with custom comparator

Session 3: STL - II

* Map and Its Application
* Set and Its Application
* Queue and Dequeue ( Basic Problems Only )

Session 4: Problem Solving Techniques

* Popular Greedy Algorithm Techniques
* When To Use and Think About Brute Force
* What Is Implementation & Constructive Algorithm & Ad Hoc
* Prefix Sum
* Two Pointer

Session 5: Binary Search & Other’s

* Binary Search : Basic + Implementation + STL
* Discussion About Problems To Intuition Where Binary Search Used
* Modular Arithmetic ( % ) Usage and Overflow Cases In Contest

Session 6: Number Theory and Bit - I

* GCD - LCM and Their Applications
* Primality Check ( Square Root and Existence of Sieve )
* Finding Divisor

Session 7: Number Theory and Bit - II

* Prime Factorization
* Bit ( OR - AND - XOR ) and Their Basic Applications
* Introduction To Bitmask and Its Basic Applications
* Big Mod Usage and Template Only

Session 8: Recursion

* Recursion Basic
* Recursion Tree
* Fibonacci Explanation
* 5 Steps To Remember Techniques
* Big Mod : How It Works !!

Session 9: Geometry and Combinatorics

* Basic Geometry Concept and Formula
* Geometry Template For Contest
* Combinatorics and Its Application