Beginner Track *(Codeforces ≤ 1300 / CodeChef ≤ 1700)*

1. **Number System**

   Base conversions and working with different number systems.

2. **Bit Manipulation Basics**

   Binary Number System, Bitwise operators, 1's complement, 2's complement

3. **Euclid Algorithm**

   Efficiently find HCF/GCD and LCM using the Euclidean algorithm in O(log N) time.

4. **Efficient Prime and Factor Computations**

   O(Sqrt N) method for finding factors, performing prime factorization, and checking primality.

5. **Sieve of Eratosthenes**

   Efficient algorithm to generate prime numbers and its applications like precomputing factors, prime-factorisation, etc.

6. **Modular Arithmetic**

   Modulo Properties, Mod Inverse

7. **Binary Exponentiation**

   Compute large powers in logarithmic time using an efficient algorithm.

8. **Basic Combinatorics**

   Permutations and combinations (Class 11th-12th level).

9. **Basic Probability and Expected Value**

   Probability and calculating expected values (Class 11th-12th level).

10. **nCr Modulo P**

    Efficiently answer binomial coefficient queries using precomputation and O(1) time queries.

Advanced Track *(Codeforces > 1300 / CodeChef > 1700)*

1. **All Topics in Beginner Track**
2. **Advanced Number Theory**.

   Refer to Cp-Algorithms Topics List.
3. **Matrix Exponentiation**

   Efficiently solve recurrence relations using matrix multiplication.
4. **Advanced Combinatorics, Probability and Expected Value**

   Catalan Numbers, advanced probability calculations and Inclusion-Exclusion Principle.
5. **Digit DP**

   Count numbers following specific properties super efficiently using Digit DP.
6. **Game Theory**

   Grundy Numbers, Nim Game and strategy-based problem-solving.