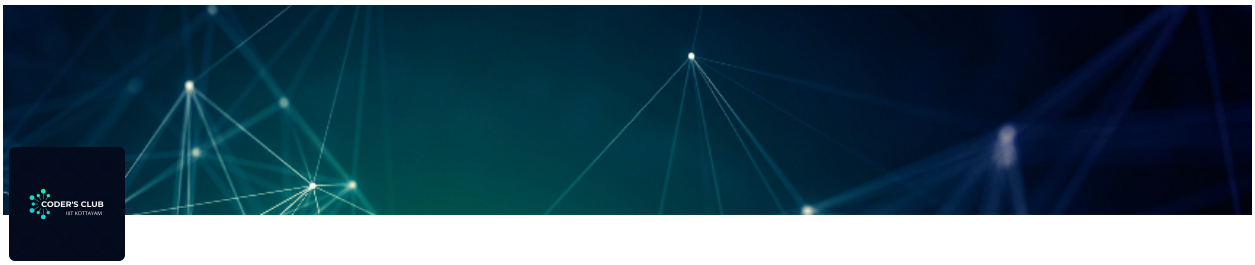

Coder’s Club Chapter #01 Resource

By ***Precizne***, 15 January 2024 17:43

Videos

https://www.youtube.com/watch?v=KOzByAdxVZ8

Links in the Description provide further details

Reference Books and Materials

CP 1 - Guide to Competitive Programming.pdf

- https://codeforces.com/blog/entry/91363
- https://usaco.guide/gold/divisibility
- https://usaco.guide/gold/modular
- https://usaco.guide/gold/combo

Ad-Hoc Maths

- Observe patterns, convergence, monotonicity, repetitions etc
- Try to formulate closed form equations or draw comparisons
- Observe constraints and ranges

Number Theory

- Primes and Properties
  - https://www.geeksforgeeks.org/prime-numbers/
- Sieve of Eratosthenes
  - https://www.geeksforgeeks.org/sieve-of-eratosthenes/
- Primality Testing
  - https://www.geeksforgeeks.org/introduction-to-primality-test-and-school-method/
  - https://www.geeksforgeeks.org/lucas-primality-test/
  - https://www.geeksforgeeks.org/fermat-method-of-primality-test/
  - https://codeforces.com/blog/entry/79941
- Factorization and SPF
  - https://www.geeksforgeeks.org/prime-factorization-using-sieve-olog-n-multiple-queries/
- Euclidean, Extended Euclidean and GCD
  - https://www.geeksforgeeks.org/euclidean-algorithms-basic-and-extended/
  - https://www.geeksforgeeks.org/mathematical-algorithms/mathematical-algorithms-gcd-lcm/
- Modular Arithmetic
  - https://www.geeksforgeeks.org/modular-arithmetic/
- Euler’s Theorem (Totient Function)

    - https://www.geeksforgeeks.org/eulers-totient-function/
- Linear Diophantine Equations
    - https://www.geeksforgeeks.org/linear-diophantine-equations/
- Chinese Remainder Theorem
    - https://www.geeksforgeeks.org/introduction-to-chinese-remainder-theorem/
- Mobius Inversion
    - https://www.geeksforgeeks.org/introduction-to-mobius-inversion/
    - https://codeforces.com/blog/entry/53925
- Other
    - https://www.geeksforgeeks.org/program-for-nth-fibonacci-number/

Combinatorics

- Permutations and Combinations
    - https://www.geeksforgeeks.org/permutations-and-combinations/
    - https://www.geeksforgeeks.org/program-for-factorial-of-a-number/https://www.geeksforgeeks.org/introduction-and-dynamic-programming-solution-to-compute-ncrp/
- Binomial Coefficients
    - https://www.geeksforgeeks.org/binomial-coefficient-dp-9/
- Catalan Numbers
    - https://www.geeksforgeeks.org/program-nth-catalan-number/
- Set Theory
    - https://www.geeksforgeeks.org/set-theory/
- Derangements

    - https://www.geeksforgeeks.org/count-derangements-permutation-such-that-no-element-appears-in-its-original-position/
    - https://www.geeksforgeeks.org/largest-derangement-sequence/
    - https://codeforces.com/blog/entry/66176
- Burnside Lemma and Polya's Enumeration Theorem

  chap1dm.pdf

    - https://www.geeksforgeeks.org/orbit-counting-theorem-or-burnsides-lemma/
    - https://codeforces.com/blog/entry/51272
    - https://codeforces.com/blog/entry/64860

Questions

- Math
    - https://codeforces.com/problemset/problem/1633/C
    - https://codeforces.com/problemset/problem/1792/B
    - https://codeforces.com/problemset/problem/1497/C1
    - https://codeforces.com/problemset/problem/1526/B
    - https://codeforces.com/problemset/problem/1688/D
    - https://codeforces.com/contest/1916/problem/D

- Number Theory
    - https://codeforces.com/problemset/problem/1826/B
    - https://codeforces.com/problemset/problem/1736/B
    - https://codeforces.com/problemset/problem/1541/B

- https://codeforces.com/problemset/problem/1838/C
- https://codeforces.com/problemset/problem/1766/D
- https://codeforces.com/problemset/problem/1537/D

- Combinatorics
  - https://codeforces.com/problemset/problem/1828/C
  - https://codeforces.com/problemset/problem/1272/C
  - https://codeforces.com/problemset/problem/1514/B
  - https://codeforces.com/problemset/problem/1648/A
  - https://codeforces.com/problemset/problem/1795/D
  - https://codeforces.com/problemset/problem/1699/C

Note:

- A lot of algorithms above like sieve, factorial, nCr etc are required to be pre-computed only once per program and NOT for every test case
- The provided Dynamic Programming implementations are meant for observation. The underlying logic and theory will be covered in dedicated DP sessions.
- Some theories are for observation, helping you understand patterns and mathematical behaviors to solve ad-hoc problems.
- They can also be useful to write closed-form O(1) equations for a given algorithm
- Material has contents ranging from simple to medium difficulty, kindly give everything a try
- Kindly fill out this form as feedback to improve upcoming materials https://forms.gle/C687bxpb6odYd6R48