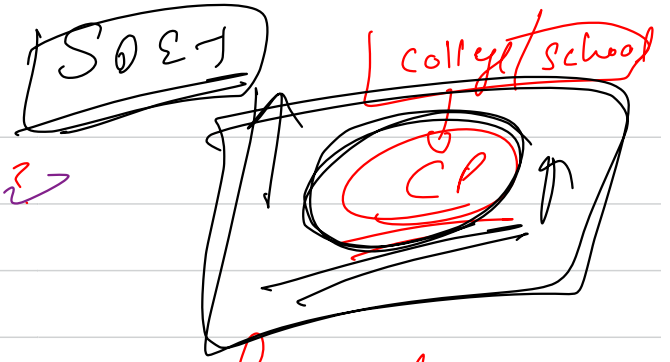
What is CP?

Why we should do CP?

Pre-requisites CP?

DS-Algo

How much CP is relevant for interviews?



CP / DEV

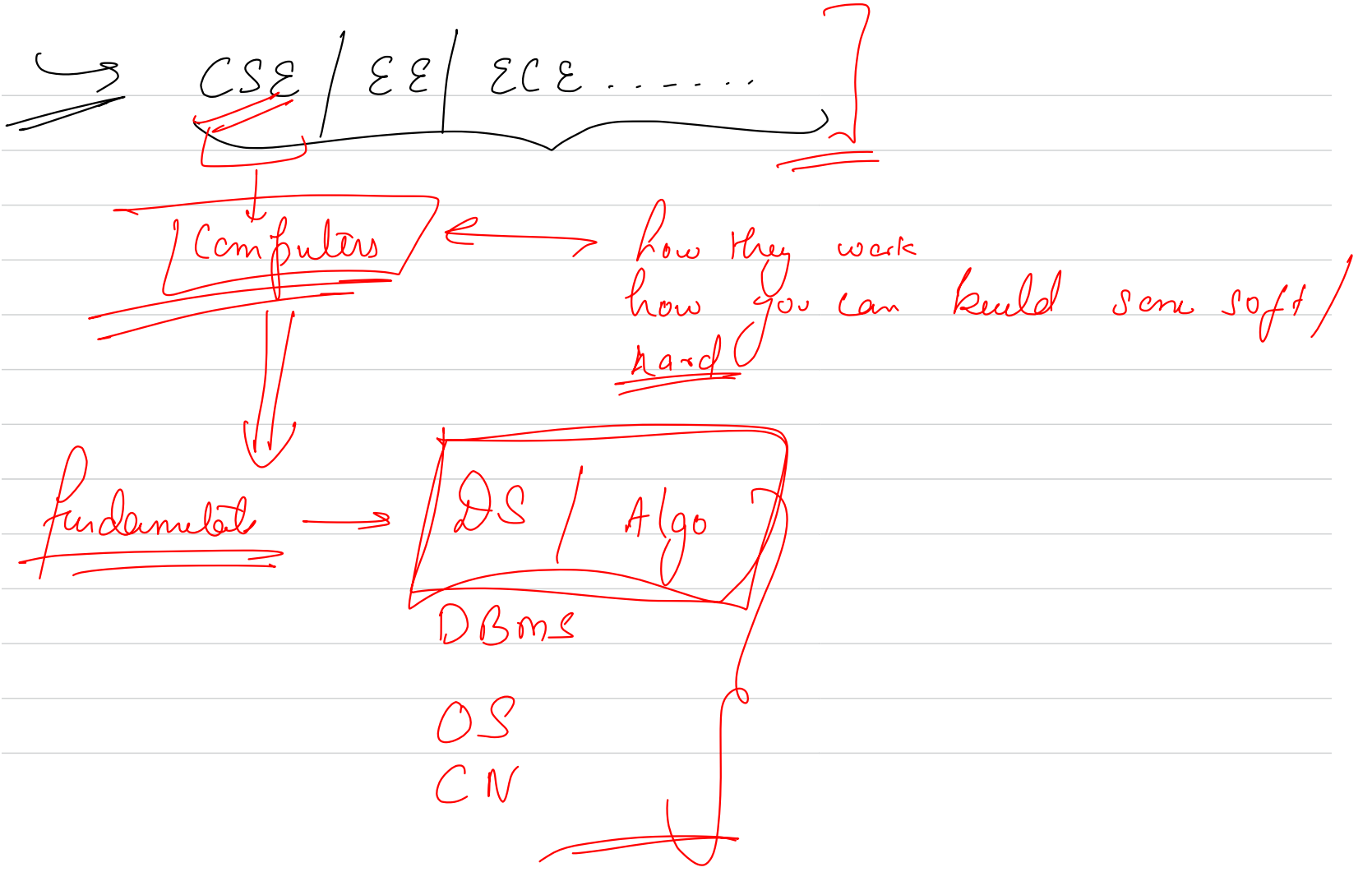
What are the famous international competitions that you can participate in.

Where to practice & learn CP for free

Hands on - problem solving

Graphs

Linkedlist
HM
Arrays / Vectors


CSE / EE / ECE .....
Computers
How they work
how you can build some soft / hard
fundamental
DS / Algo
DBMS
OS
CN

Data Structures and Algorithms

→ Programming Lang → C / C++ / Java / Python etc

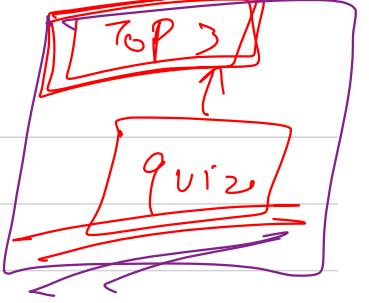
Being a Soft engg → Solve complex problems

implement the sol" via code

Amazon
MMT
Dunzo
!

Data Structures & Algo

→ CP → is a sport programming



Chess ⇐ ⇒ Fun sport

→ at any given state of pieces on the board find the most optimal move

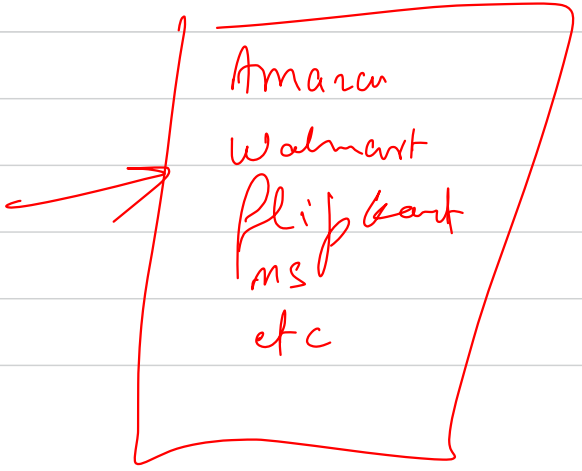
→ you are given complex problems in a time bound contest to solve

↳ Why to do CP??

→ Just fun sport

→ Or gives you recognition in the community

→ Or helps in interview preparation



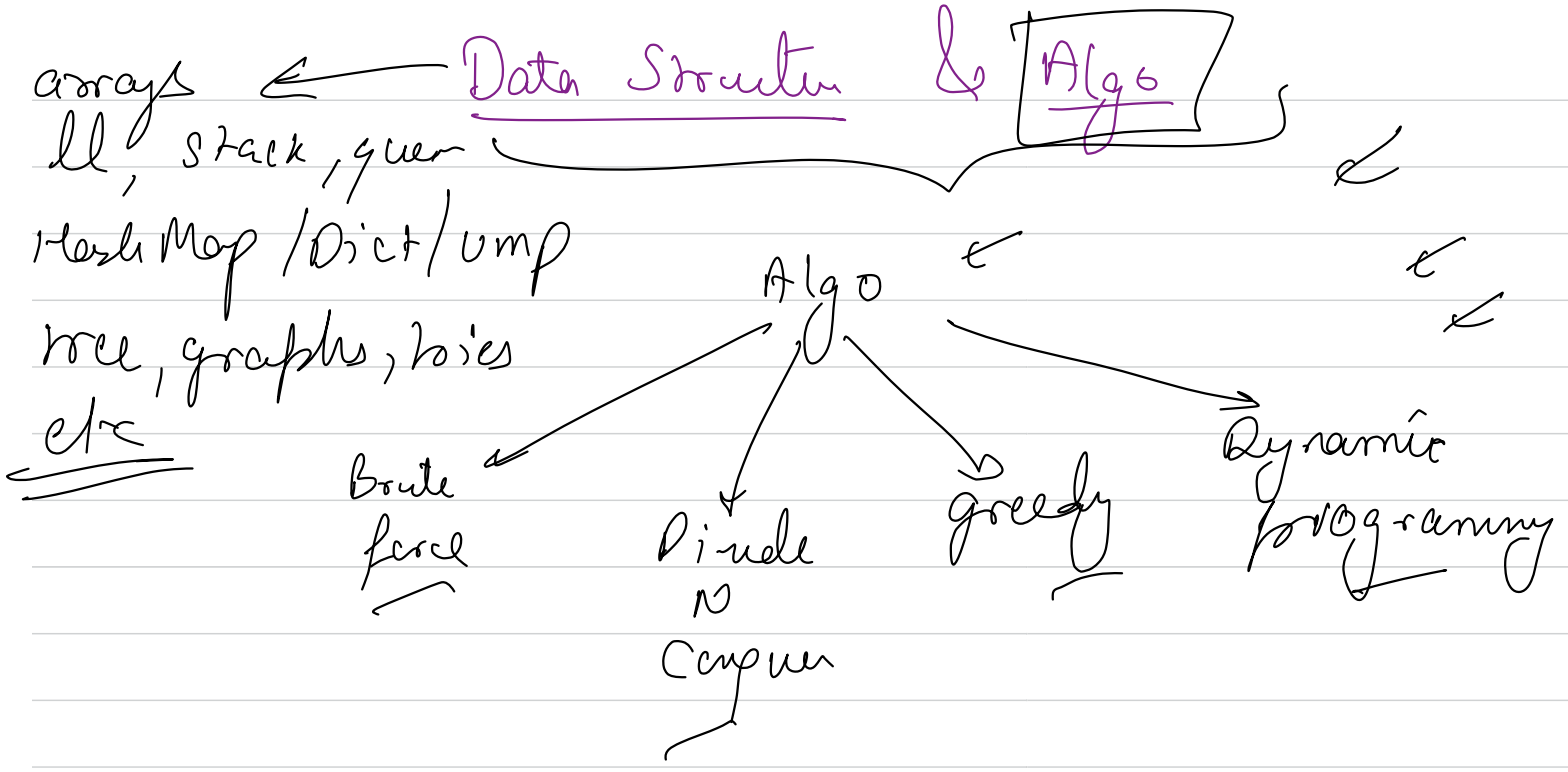
might

Pre-requisite for CP??

→ Just basic (very basic) knowledge of any prog lang.

→ loops, conditionals, functions, I-put O-put

ready to compete in CP =


arrays
ll, stack, queue
HashMap / Dict / ump
tree, graphs, tries
etc
Data Structure
&
Algo
Algo
Brute force
Divide N Conquer
greedy
Dynamic programming

a) O(n)
b) O(1)
→ c) O(1)
d) None

O(n) ← hash func?

TC of search of element in a Dict/ump/HashMap

→ Binary Search → O(log n)
Ternary Search → O(log n)

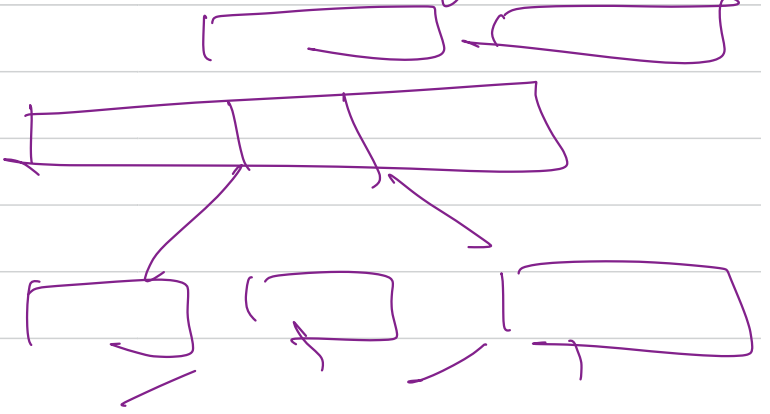
→ Ternary Search is better than binary Search

a) True
b) False ✓

× no of comparisons

Q. If merge sort is done in a way that instead of 2 sub arrays we divide it into 3 subarrays & apply merge on 3 sorted subarrays, the TC of merge sort will

a) Increase ✓
b) Decrease
c) Remains same
d) None



Q1

a) $O(n^2)$
b) $O(n \log n)$
c) $O(n)$
d) None

quicksort

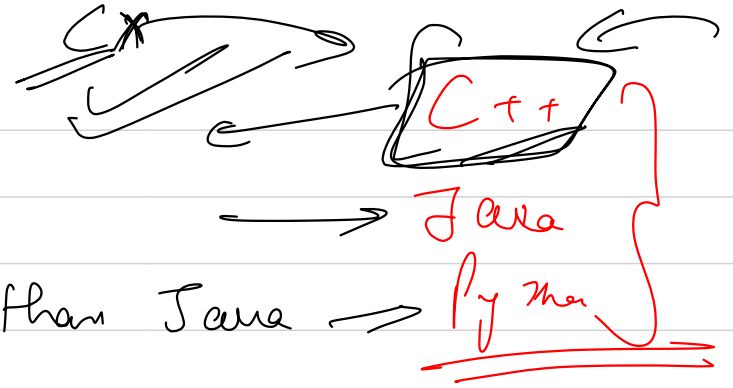
Qs → $\Theta(n \log n)$ $O(n^2)$

worst case $T(n) = T(n-1) + O(n)$

avg ⇒ $T(n) = 2T\left(\frac{n}{2}\right) + O(n)$

$\Theta(n \log n)$ → $T(n) = T\left(\frac{n}{3}\right) + T\left(\frac{2n}{3}\right) + O(n)$

What lang for CP ?

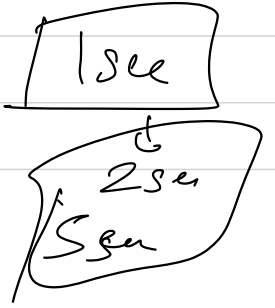


Because C++ is faster than Java → Python Ruby etc

Most of the community of CP do submit in C++

Editorials → C++

Blogs



a) 10^{100}

b) 10^{10}

c) 10^{8}

d) 10

Brute force → N nos

2, 3, 4

(2, 3)
(3, 4)
(2, 4)

TLE

a) $^nC_2/2$
b) $^nC_2$ ✓
c) $n!$
d) none

$N \leq 10^5$

$^{10^5}C_2$ ≈ 10^{10}

$$lcm(a,b) = 2\,gcd(a,b)$$

$$\boxed{lcm(a,b)} * gcd(a,b) = a * b$$

$$\frac{a \times b}{gcd(a,b)} = 2\,gcd(a,b)$$

a, b

$a = 2 \times k$

$b = 3 \times k$ → gcd

$$a \times b = 2\,gcd(a,b) \times gcd(a,b)$$

$$a = C_i \times gcd(a,b)$$

$$b = C_j \times gcd(a,b)$$

$C_i, C_j \geq 1$

$$C_i \times C_j \times gcd(a,b)^2 = 2\,gcd(a,b)^2$$

$C_i \times C_j = 2$

$C_i, C_j \geq 1$

1 int

$C_i = 1, \quad C_j = 2$

$C_i = 2, \quad C_j = 1$

$$\frac{a}{b} = \frac{C_i}{C_j}$$

$$\frac{a}{b} = \frac{1}{2}$$

$2a = b$

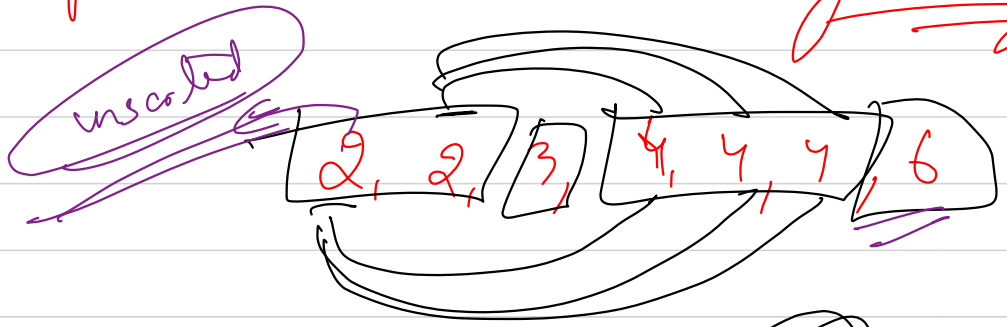
$$\frac{a}{b} = \frac{2}{1}$$

$2b = a$

$$lcm(a,b) = 2\,gcd(a,b)$$

$$lcm(x,2x) = 2\,gcd(x,2x)$$

For any no. a → calculate the no. of (2*a) present in the list of integers



3*2 ⇒ 6 + 1 ⇒ 7

a) HashMap
b) Heap
c) graph
d) bic