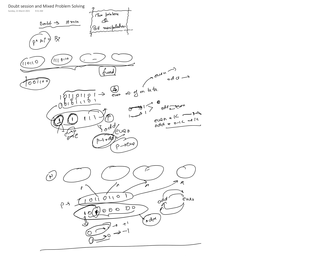
Doubt session and Mixed Problem Solving



Q. You are given an array having number from one to frequency except two numbers (like will from A and B). Find A and B.

A = [A, 1, B, 1, 3, 4, A, 5, 1, B]

Q → 2-sum problem

You are given an array of N integers and a target value. Find if there exist a pair i, j, k, l such that $i \neq j \neq k \neq l$.

$a[i] + a[j] + a[k] + a[l] = target$

⇒ [1, 0, 0, 0, 0], target = 0

⇒ [1, -1, 2, 2], [1, -1, 0, 0], [0, 0, -2, 2]

memory → time

$O(1)$ →

$O(N)$ →

$O(N^2)$ →

i, j → $a[i] + a[j] = -target$

→ target

⇒ for (i=0 — n-1) {
for (j = i+1 — n-1) {
for (k = j+1 — n-1) {
for (l = k+1 — n-1) {
if (a[i] + a[j] + a[k] + a[l] == target)

$^{N}C_4 = O(N^4) = O(1)$

sort an array.

{i, j} N1 {k, l} N2

for (i=0 — n-1)
for (j = i+1 — n-1)
for (k = j+1 — n-1) {
int a_l = target − a[i] − a[j] − a[k]
binary-search (a + k+1, a+n, a_l) ;

$N \log(N) + N^3 \log(n)$

sort arr

vector < pair < int, int >, pair < int, int > >

index.

for (i=0 ; i<n ; i++)
for (j=i+1 ; j<n ; j++)
vector < pair < int, int > > v ; v.push_back({a[i]+a[j], {i, j}}) ;

$N^2 \log(N^2)$

$2N^2 \log(N) \rightarrow N^2 \log(N)$

$O(N^2)$

sort

$N^2 \log(N) \rightarrow N^2$ ...

$N^2 \log(N) + N^2 = O(N^2 \log(N)) + O(N^2)$

$N \log(N)$

N^2

vector (int, int)

Q → Given a string, find the lex. smallest subsequence which contains all the distinct elements (charset)

a, b, c → no of distinct element

⇒ s = bcgba

⇒ bca

extra

3

(b)x

a, c

b c a

26×26 + O

a b c

111

required mark

bc gb

011

010

011

011

required mark

b c a g b g

010 100 001 010 001

O(N) 111 101 011 011 001

001

O(1)

seq = 111

a

b

D D

OR AND XOR

010 111

101 → a, c

110 → and

010 110 = 010

0 X

a, c

101 = 010

011 100

011