



Agenda.

1. Valid Anagrams
2. Emp. and Manager
3. Problem with given diff
4. Array pair divisible by k
5. Pair sum divisible by k

Valid Anagrams

str1 = "a b c b d"

str2 = "c b a d b"

Brute force

• sort them

$\left. \begin{array}{l} \text{sort}(\text{str1}) = a b b c d \\ \text{sort}(\text{str2}) = a b b c d \end{array} \right\} \text{are Equal?}$

✓ TC: $O(N \log N)$ SC: $O(1)$

str1 = "a b c b d"
↑

str2 = "c b a d b"

fmap1

a → 1
b → 2
c → 1
d → 1

fmap2

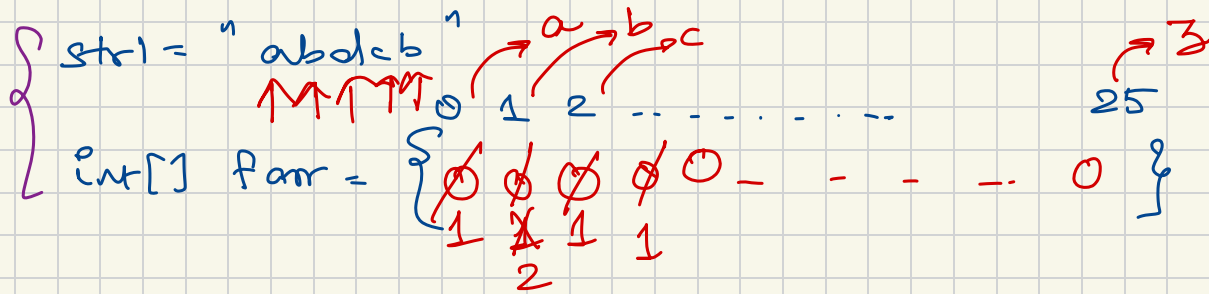
c → 1
b → 2
a → 1
d → 1

- check are unique entity same ($\text{fmap1.size}() == \text{fmap2.size}()$)
- value of each key in $\text{fmap1} ==$ value of that key in fmap2

TC: $O(N)$ SC: $O(26) + O(26) \sim O(1) \checkmark$

↓

No. of alphabets.



$\boxed{\text{ch} - \text{'a'}} \rightarrow \text{get relative dist.}$

TC: $O(N)$ SC: $O(1)$

Employees and Manager

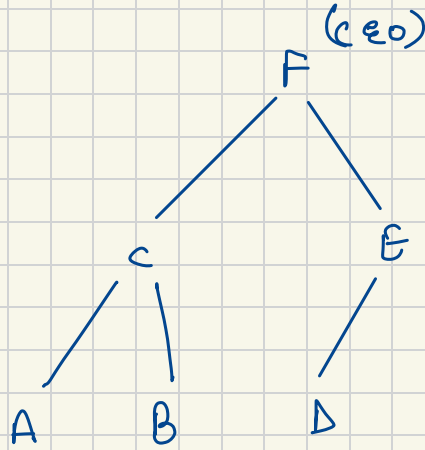
key (Emp)

✓
✓
✓
✓
✓
✓

A
B
C
D
E
F

Value (Manager)

C
C
C
C
C
C

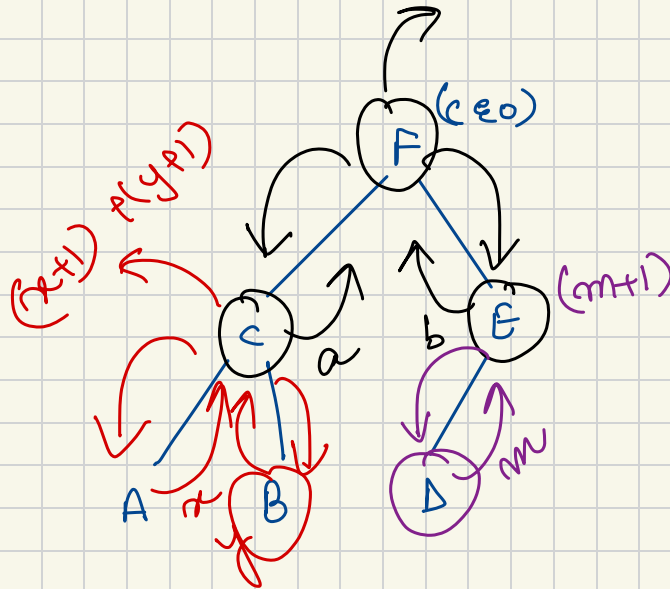


o/p

A	→	0
B	→	0
C	→	2
D	→	0
E	→	1
F	→	5

faith: tells number of Emp under me
 $\text{fun}()$

$$\sum_i (a+1) + (b+1) = \text{total Emp Under me}$$



people reporting directly to a Manager

key (Emp)

✓ ✓ ✓ ✓ ✓
A B C D E

Value (Manager)

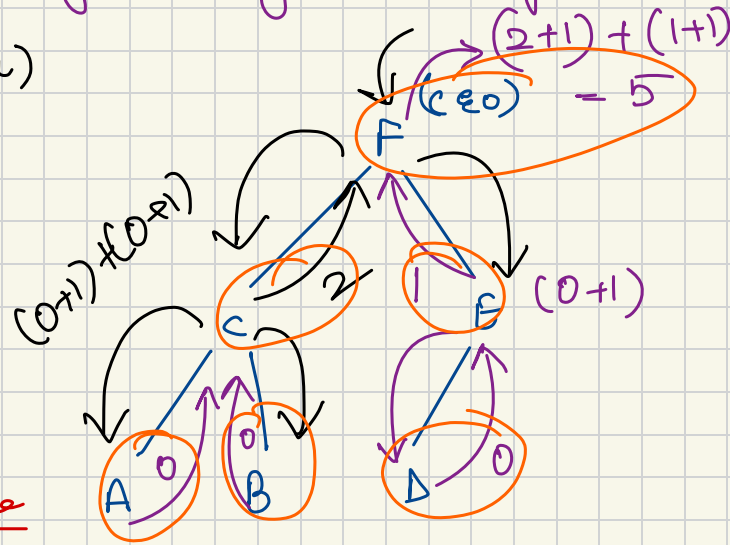
C C C C C

(Manager)
Emp Name

C →
P →
D →

Directly Reported

{ A, B }
{ D }
{ C, E }



key (Emp)

✓
✓
✓
✓
✓
✓
A
B
C
D
E

Value (Manager)

C
D
D
C
D
C

✓
ceo = A

Manager

C

→

{A, B}

D

→

{C, E}

E

→

{A}

direct reportees

Problem with a given difference

`int[] arr = { 5, 10, 3, 2, 50, 80 }` $B = 78$
 ↑

Brute force

`pair(a, b)`

$a - b = B$
 $b - a = B$

$TC: O(N^2)$
 $SC: O(1)$

`for (int i = 0 → n)`

`{ for (int j = i + 1; → n)`

`{ if (arr[j] - arr[i] == B || arr[j] - arr[i] == -B)`
 `return true`

`}`
`}`

$$\text{int[] arr} = \{ 5, 10, 3, 2, 50, 80 \} \quad B = 78$$

\uparrow \uparrow \uparrow
 x y B

$$\begin{aligned} x &= 80 \\ y &= 2 \\ y &= 158 \end{aligned}$$

$(x, y) \rightarrow \text{pair}$

$$\left. \begin{aligned} x - y &= B \\ y - x &= B \end{aligned} \right\}$$

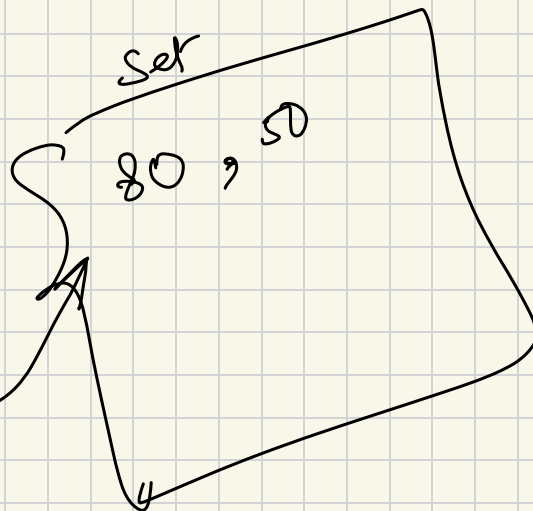
$$y = x - B$$

$$y = B + x \quad \checkmark$$

$$\begin{aligned} x &= 50 \\ y &= -28 \\ y &= 128 \end{aligned}$$

$$\begin{aligned} x &= 2 \\ y &= -76 \\ y &= 80 \end{aligned}$$

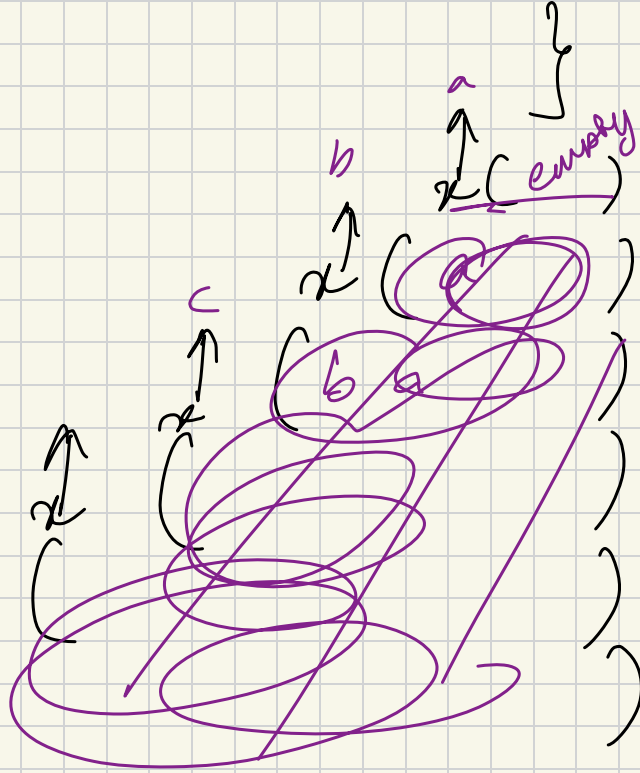
pair



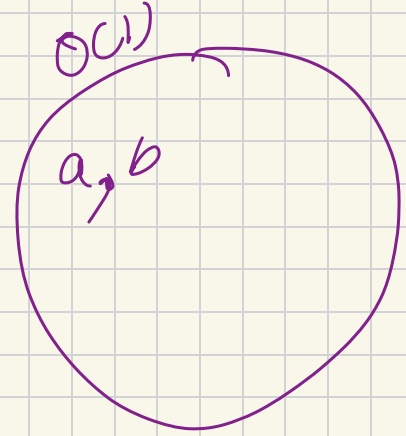
}

↑
2

↑
2



TC: $O(N^2)$



Array Pair Divisible by K.

int[] arr = { ~~1~~, ~~2~~, ~~3~~, ~~4~~, ~~5~~, ~~6~~, ~~7~~, ~~8~~, ~~9~~, ~~10~~ } $K = 5$

$n/2 \rightarrow$ Such pair, sum of each pair is divisible K.

(1, 1)	(2, 8)	(3, 7)	(4, 6)	(5, 10)
↓	↓	↓	↓	↓
10	10	10	10	15

possible

(x, y)

$x + y$ divisible by K

$$(x + y) = dK$$

$$(K \times d_1 + r_1) + (K \times d_2 + r_2) = dK$$

$$K(d_1 + d_2) + (r_1 + r_2) = dK$$

$$\underline{\underline{(r_1 + r_2)}}$$

↓

$r_1 + r_2 = K \text{ or } r_1 + r_2 = 0$

$$\underline{\underline{0 \leq r < K}}$$

$K \overline{) x} \begin{matrix} d \\ r \end{matrix}$

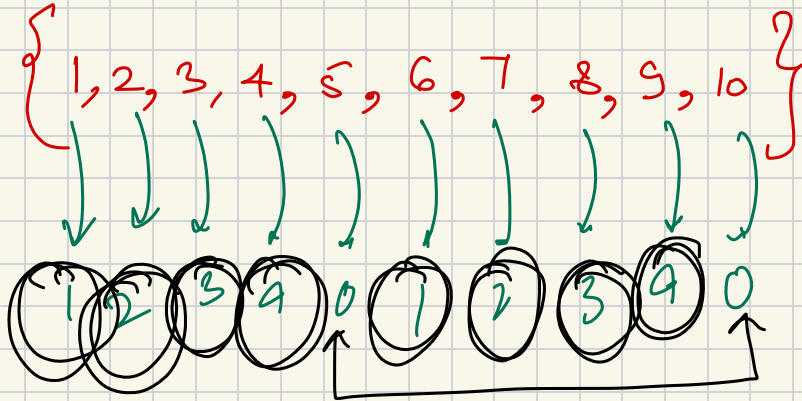
↓

$x = Kxd + r$

(x, y)

↳ divisible by k

↓
✓ When sum of $(r_1, r_2) = k$ or 0



fnmap

rem

freq

2
1
3
4
0

2
2
2
2
2

- largest Subarray with sum equal to zero.

H.W

- equilibrium index
- Count Num of pairs with absolute diff k .
- Find repeating and missing no.