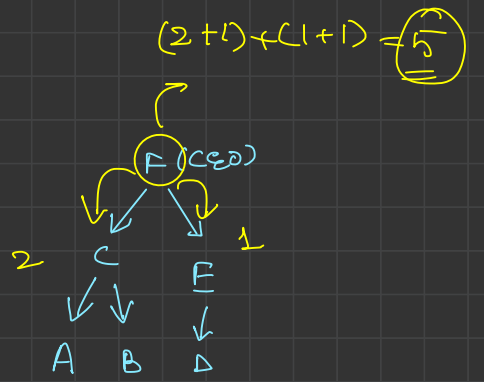
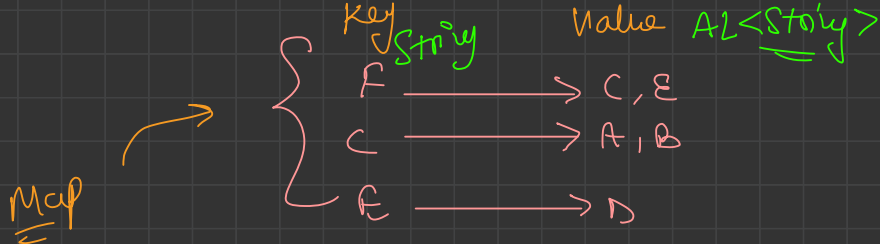
Employees and Manager.

6	
A	C
B	C
C	F
D	E
E	F
F	F



asking direct reportees.

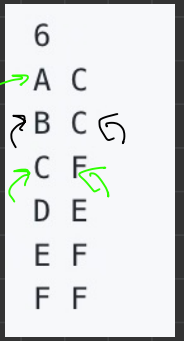
fun: tell me no. of employees under me



```java
for (String emp_name : emp.keySet()) {
    String mngr_name = emp.get(emp_name);

    if (mngr_name.equals(emp_name) == true) {
        // CEO
        ceo = emp_name;
        continue;
    }

    if (directReportees.containsKey(mngr_name) == true) {
        ArrayList<String> my_team = directReportees.get(mngr_name);
        my_team.add(emp_name);
        directReportees.put(mngr_name, my_team);
    } else {
        ArrayList<String> my_team = new ArrayList();
        my_team.add(emp_name);
        directReportees.put(mngr_name, my_team);
    }
}
```



mngr_name

C

team

{A, B}

{C}

$CCO = F$

$$\begin{cases} F \longrightarrow \{C, E\} \\ C \longrightarrow \{A, B\} \\ E \longrightarrow \{D\} \end{cases}$$

Problem with given diff

arr[] = { 5, 10, 3, 2, 50, 80 } B = 75

Brute force

```
for(int i = 0 ⟶ n-1)
    for(int j = i+1 ⟶ n)
        if(arr[i] - arr[j] == B || arr[j] - arr[i] == B)
            return
```

arr[] = { 5, 10, 3, 2, 50, 80 }

B = 75

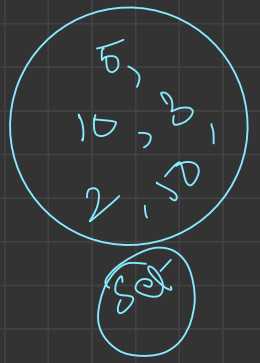
(x, y)

$x - y = B$

$y - x = B$

$y = x - B$

$y = B + x$



x = 5
y = -70
y = 80

x = 10
y = -65
y = 85

x = 3
y = -72
y = 78

x = 80
y = 5

x = 2
y = -73
y = 77

x = 50
y = -25
y = 125

Array Pair divisible by K.

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

↓

[n/2 such pair that, sum of each pair is divisible by K]

n/2

(1,4) (2,3) (5,10) (6,9) (7,8)

5 5 15 15 15

Brute force.

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

TC: O(N²)
SC: O(N)

(x, y) sum is divisible by K

$$(x+y) \% K = 0$$

$x = a * K + rem1$

$y = b * K + rem2$

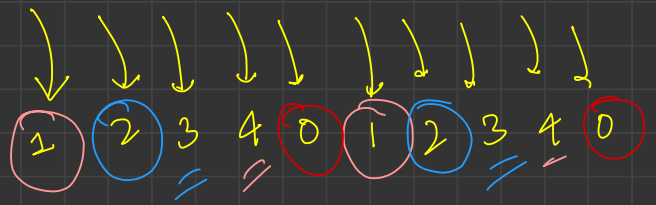
$x+y = a*K + rem1 + b*K + rem2$

$= K(a+b) + (rem1 + rem2)$

$K(a+b)$ → divisible K

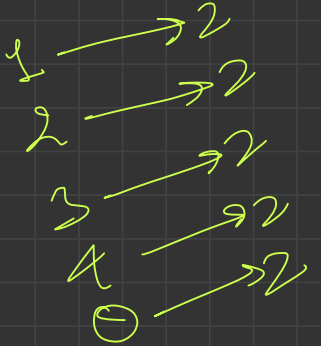
$(rem1 + rem2)$ → should be divisible by K

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



rem1 + rem2 = K

rem1 = K - rem2



① equal freq of comp. rem. to rem1 and

② even numbers of zero.

freq Map
Key → Rem

largest Subarray With Zero Sum.

arr[] = { 15, -2, 2, -8, 1, 7, 10, 23 }

Brute force

↳ TC: O(N²)
SC: O(1)

arr[] = { 15, -2, 2, -8, 1, 7, 10, 23 }

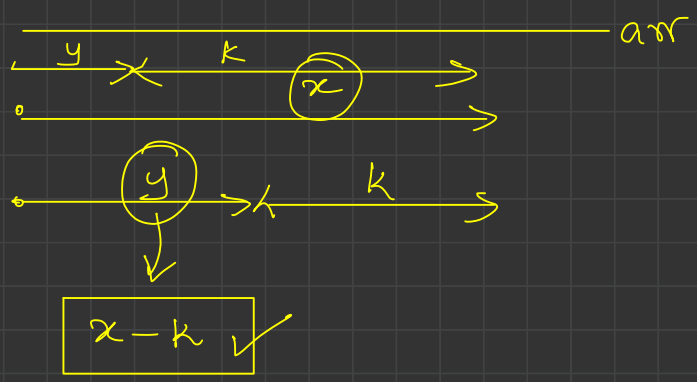
2 - 0 = 2

5 - 0 = 5

Subarray Sum equal to K

int[] = { 10, 2, -2, -20, 10 } K = 10

3 subarrays



step1 = y : x-1

x ↻ step2 = no. of time i have seen y

2