Competitive Programming

Domain question solution

Aditya Kaleeswar
GK

Create String

Problem

Chef has two strings S1 and S2 both made up of alphabets from the word COOKOFF(C,O,K,F). He wants to know whether he can create any permutation of S1 by joining various permutations of S2 together.

Input Format

- The first line contains the number of test cases(T)
- For each testcase, the next 2 lines contain two strings, S1 and S2 respectively

Output Format

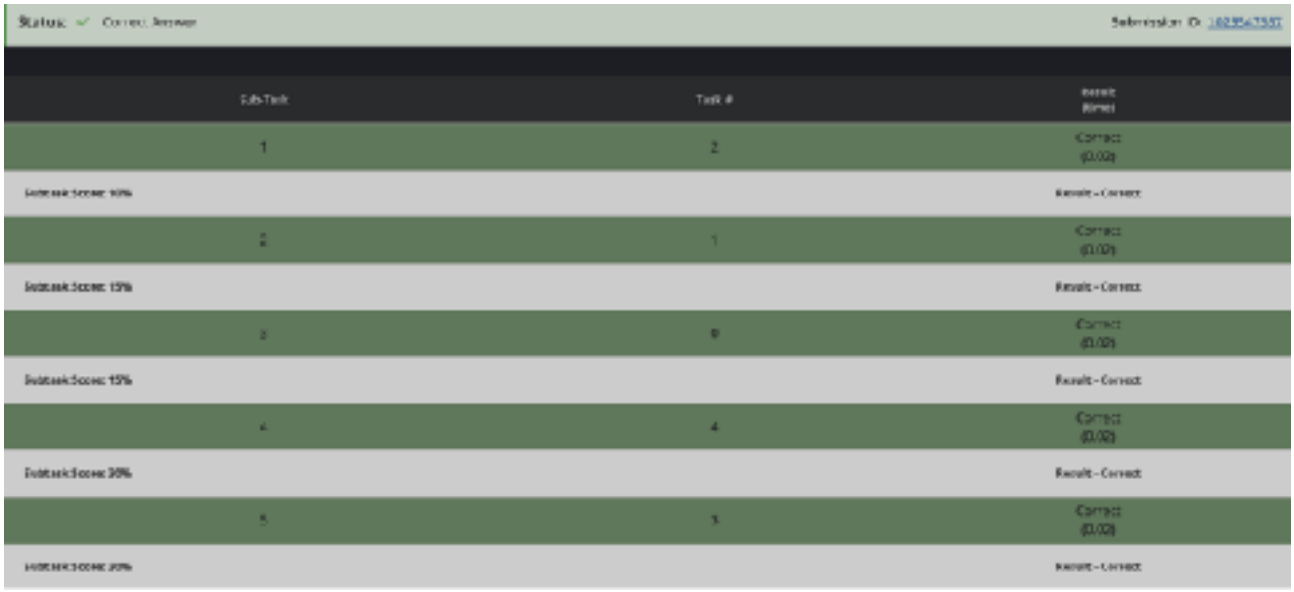
Output "YES" if chef can create any permutation of S1 by joining various permutations of S2 together. Output "NO" otherwise

Approach

Checking the frequency of each letter in string 1 and string 2 if the frequency of each letter in string 1 is greater than string 2 and if len(string1)> = len(string2) then the follow permutation is possible

```
def permute():
    t = int(input())
    while t > 0:
        s1 = input()
        s2 = input()

        fs1 = [0, 0, 0, 0]
        fs2 = [0, 0, 0, 0]

        if len(s1) % len(s2) == 0 and len(s2) <= len(s1):
            for letter in s1:
                if letter == 'C':
                    fs1[0] += 1
                elif letter == 'O':
                    fs1[1] += 1
                elif letter == 'K':
                    fs1[2] += 1
                elif letter == 'F':
                    fs1[3] += 1

            for letter in s2:
                if letter == 'C':
                    fs2[0] += 1
                elif letter == 'O':
                    fs2[1] += 1
                elif letter == 'K':
                    fs2[2] += 1
                elif letter == 'F':
                    fs2[3] += 1
```

```
            permute_possible = all(fs2[i] <= fs1[i] for i in range(4))
            efs1 = int(len(s1) / len(s2))

            if permute_possible and all(i == efs1 for i in fs1):
                print("Yes")
            else:
                print("No")
        else:
            print("No")
        t -= 1
permute()
```



SubTask	Test #	Result (Error)
1	2	Correct (0.02)
Subtask Score: 10%		Result - Correct
2	1	Correct (0.02)
Subtask Score: 15%		Result - Correct
3	0	Correct (0.02)
Subtask Score: 15%		Result - Correct
4	4	Correct (0.02)
Subtask Score: 30%		Result - Correct
5	3	Correct (0.02)
Subtask Score: 30%		Result - Correct

Add powers of 2

Chef has been given two integers N and K. His task is to choose m positive numbers(A1,A2.....Am) such that N+2^A1+2^A2.....2^Am = K while also minimising the value of m. Help him find the solution

Input Format

- First line contains an integer, T denoting the number of testcases
  - For each testcase, Line 1 contains two space separated integer N and K denoting the initial value and K(Power of 2) that needs to be achieved

Output Format

For each test case, print the minimum numbers of powers of 2 required to get K

Approach :
Counting the number of 1 in the binary representation

```python
def add():
    t = int(input())

    while t > 0:
        num = input()
        integers = [int(x) for x in num.split()]
        N = integers[0]
        K = integers[1]
        diff = bin(N - K)[2:]
        rev = diff[::-1]
        c = 0

        for i in rev:
            if i == '1':
                c += 1

        print(c)

        t -= 1

add()
```

Status: ✔ Correct Answer Submission ID: 1023548793

Sub-Task	Task #	Result (time)
1	0	Correct (0.02)
Subtask Score: 10%		Result - Correct
2	1	Correct (0.02)
Subtask Score: 15%		Result - Correct
3	2	Correct (0.02)
Subtask Score: 15%		Result - Correct
4	3	Correct (0.02)
Subtask Score: 30%		Result - Correct
5	4	Correct

Build a staircase ✓

Chef wants to build a staircase. He has ordered blocks of different sizes in order to construct it.

He was delivered the stairs separately in a jumbled order. He makes trips using a crane to pick up blocks on the way and stack it. He gets two groups of stairs such that, when placed one after another, a full staircase is made. Order of the sizes of blocks is given in an array. Chef has fuel for maximum two trips. Print whether he can make the staircase or not

Input Format

- First line contains an integer, T denoting the number of testcases
  - For each testcase, Line 1 contains an integer, N denoting the height of the staircase
  - Next line contains N space separated integers each denoting the height of the blocks

Output Format

Print "Yes" if it is possible to make the staircase in 2 trips. "No" otherwise

Approach :
By comparing with the sorted array in ascending order to the given array

Status: ✓ Correct Answer — Submission ID: 1023549205

Sub-Task	Task #	Result (time)
1	1	Correct (0.02)
Subtask Score: 10%		Result - Correct
2	0	Correct (0.02)
Subtask Score: 15%		Result - Correct
3	2	Correct (0.02)
Subtask Score: 15%		Result - Correct
4	4	Correct (0.02)
Subtask Score: 30%		Result - Correct
5	3	Correct (0.02)

```python
def stair():
    t = int(input())
    while t > 0:
        n = int(input())
        line = input()
        inte = line.split()
        integ = [int(num) for num in inte]
        sortedint = sorted(integ)
        check = 0

        for i in range(2):
            for j in range(len(integ)):
                if integ[j] == sortedint[0]:
                    sortedint.pop(0)
                if len(sortedint)==0 :
                    check=1
                    break
            if (check==1) :
                break
        if check ==1 :
            print("Yes")
        else :
            print("No")

        t -= 1

stair()
```

Array Recreate ✔

Chef has an array of integers from 1 to N in jumbled order. Chef allows his friend to ask for subsequences of the array as many times as he requires. But, when chef gives the numbers of the subsequence, he gives it in a jumbled order. What is the minimum number of such requests his friend can make to recreate the original array

Input Format

First line contains the number of testcases, T. Second line contains an integer, N denoting the length of the array

Output Format

Output an integer,M denoting the minimum number of request his friend needs to make

Approach :
As the array is in jumble order and to find the minimum number of request for to find the sorted array is to find the number of times
By using the merge sort algorithm to find the number of times it runs which is log2(n);

```
import math
def arr():
    t=int(input())
    while t>0 :
        n=int(input())
        print(math.ceil(math.log2(n)))
        t-=1

arr()
```

Status: ✓ Correct Answer Submission ID: 1023550631

Time:
4.71s

Sub-Task	Task #	Result (time)
1	0	Correct (0.05)
Subtask Score: 5%		Result - Correct
2	1	Correct (0.03)
Subtask Score: 5%		Result - Correct
3	2	Correct (0.03)

Bitwise XOR ✓

Chef has been given an array. He wants to know the number of pair with the given XOR and SUM values

Input Format

- First line contains an integer,T denoting the number of testcases
  - For each test case, Line 1 contains an integer, N denoting the length of the array
  - Next line contains N space separated integers denoting the elements of the array
  - Next line contains two space separated integer denoting the required XOR and SUM values

```python
def arr():
    t = int(input())
    while t>0 :
        n=int(input())
        l = list(map(int, input().split()))
        r = list(map(int, input().split()))
        l1=len(l)
        x=r[0];
        s=r[1];
        check=0
        for i in range(0,l1-1):
            for j in range(i+1,l1) :
                if l[i] ^ l[j]==x and l[i]+l[j]==s :
                    check+=1

        print(check)
        t-=1
arr()
```

Status: ✔ Correct Answer Submission ID: 1023551113

Time:
3.13s

Sub-Task	Task #	Result (time)
1	3	Correct (0.02)
Subtask Score: 10%		Result - Correct
2	4	Correct (0.02)
Subtask Score: 15%		Result - Correct
3	1	Correct (3.13)
Subtask Score: 15%		Result - Correct

Find the minimum amount

There are n islands for which X and Y coordinates are given. Chef, being a greedy ruler wants to conquer them all. The cost to conquer each island is K. However, when chef conquers island, he can connect them using bridges. When an island can be surrounded by other island and its bridges completely, conquering the island becomes easier. The cost to conquer now gets divided by a constant C. Chef wants to spend the least and conquer all the island. Find the minimum amount he will have to spend to conquer every island optimally

```
def mincost() :
    t=int(input())
    l=[]
    while t>0 :
        n=int(input())
        for i in range(n):
            num = input()
            num=num.split()
            l.append(num);
        k=int(input())
        c=int(input())
        leng=len(l)
        cost = k*leng
        print(cost)
        t-=1
mincost()
```

Status: ✔ Partially Correct Answer Submission ID: 1023545703

Score:
10/10

Sub-Task	Test#	Result (time)
1	1	Correct (0.03)
Subtask Score: 5%		Result - Correct
2	0	Correct (0.04)
Subtask Score: 5%		Result - Correct
3	5	Skipped Testfile
Subtask Score: 0%		Result - Skipped Testfile
4	2	Wrong Answer (0.03)