

Problem : 16010201 - Problem2 ice-breaking game

Problem :

(40 points) A classic ice-breaking game is played in the following rule. $n \in \mathbb{N}$ persons make a circle and

call numbers 1,2,3,... in turns. However, if the number one should call is a multiple of $m \in 2,3,\dots,9$ or has its last digit being m , she/he should clap her/his hands and call nothing. For example, if $m=4$,

the numbers that will be called are 1,2,3,5,6,7,9,10,11,13,15,17,18,19,21,... and so on.

Therefore, suppose there are five persons in this game ($n=5$), the first person will call 1,6,11,21,..., and the fourth person will call 9,19,....

The question is: For a game with n persons and a number m , what will be the sum of all numbers called by the k th person if the game ends at the number T ? Let's consider the example in the previous

paragraph. If $n=5, m=4, k=4$, and $T=25$, then the answer is 28(9+19); if $n=5, m=4, k=1$, and $T=30$, then the answer is 65(1+6+11+21+26).

Input :

There are 15 input files. In each file, there are 4 nonzero integers n, m, k , and T in one single line.

Two

consecutive integers are separated by one white space. We have

$n \in 1,2,\dots,1000, m \in 1,2,\dots,100, k \in \mathbb{N}, k \leq n$, and $T \in 1,2,\dots,100000$.

Output :

Given these input values, your program should print out one integer as the answer according to the above rule.

Sample Input :

Sample a

5 4 4 25

Sample b

5 4 1 30

Sample Output :

Sample a

28

Sample b

65

Problem : 16010202 - Problem3 One-piece

Problem :

(45 points) Alice, Bob, Cindy, and Dororo are four pirates. One day, they found a lot of equally large diamonds put in $n \in \mathbb{N}$ boxes. While some boxes contained more diamonds than others, all boxes looked

the same. While they were happy, they faced the question of dividing the diamonds into four pieces as

equally as possible.

They decided to use the following rule. First, close all the boxes and put them in a list. Then they open each box one by one. Once the i th box is opened, the number of diamonds inside x_i is counted. The

box and all the diamonds inside are then given to the person who currently owns the least diamonds. If

there is a tie, the box should be assigned to the person whose name is ordered first alphabetically among

those who owns the least diamonds. The process continues until all boxes are open and assigned.

As an example, suppose there are $n=15$ boxes, and the numbers of diamonds in the boxes are 4,3,7,15,4,3,14,26,8,10,2,12,16,20, and 1 (in the order of the boxes in the list). Then according to the rule, these boxes of diamonds will be assigned to them in the following way:

You are asked to find the total numbers of diamonds they obtain at the end and list them in the ascending

order. In this example, your should answer 30,33,37, and then 45. Note that though Dororo gets the

most diamonds when each of them is assigned their first box, at the end he gets the least diamonds.

This reflects an old saying: "Don't celebrate too early!"

Input :

There are 15 input files. In each file, there are $n+1$ nonzero integers n, x_1, x_2, \dots , and x_n in one single line. Two consecutive integers are separated by one white space. We have $n \in 1, 2, \dots, 10000$ and $x_i \in 1, 2, \dots, 100$ for all $i=1, \dots, n$.

Output :

Given these input values, your program should print out four integers as the answer according to the above rule.

Sample Input :

15 4 3 7 15 4 3 14 26 8 10 2 12 16 20 1

Sample Output :

30 33 37 45