

ARRAY DIVISION - I

Write a program to get an array in ascending order and a number as input and do the following.

By removing a single element from the given input array, form a resultant array that should be divisible by the given number. The new sum of the result array should be the maximum possible sum obtained after removing the element from the original array. Display the new array and the number that was removed. If no such number exists in the array then display the original array itself.

Sample Input 1:

Elements of the Array: {1, 2, 3, 4, 5}
Number: 4

Sample Output 1:

Elements of the Output Array = {1, 2, 4, 5}
Elements Removed: 3

Explanation:

Sum of the initial array = 15.
Multiples of the number 4, that is less than 15 = {0, 4, 8, 12}

If the element '3' is removed from the input array then the new sum of the result array will be 12. The result array's sum is also divisible by 4.

Sample Input 2:

Elements of the Array: {1, 2, 7}
Number: 6

Sample Output 2:

Elements of the Output Array = {1, 2, 7}
Elements Removed: -

Explanation:

Sum of the initial array = 10.

A new array cannot be formed with multiples of 6 by removing any element in the original array. Hence it is printed as is.

ARRAY DIVISION - II

Write a program to get an array in ascending order and a number as input and do the following.

By removing a single element from the given input array, form a resultant array that should be divisible by the given number. The new sum of the result array should be the maximum possible sum obtained after removing the element from the original array. Display the new array and the number that was removed. If no such number exists in the array then display the original array itself.

Sample Input 1:

Elements of the Array: {1, 2, 3, 4, 5}
Number: 4

Sample Output 1:

Elements of the Output Array = {1, 2, 4, 5}
Elements Removed: 3

Explanation:

Sum of the initial array = 15.
Multiples of the number 4, that is less than 15 = {0, 4, 8, 12}

If the element '3' is removed from the input array then the new sum of the result array will be 12. The result array's sum is also divisible by 4.

Sample Input 2:

Elements of the Array: {1, 2, 7}
Number: 6

Sample Output 2:

Elements of the Output Array = {1, 2, 7}
Elements Removed: -

Explanation:

Sum of the initial array = 10.

A new array cannot be formed with multiples of 6 by removing any element in the original array. Hence it is printed as is.

VALIDATE PATTERN

Write a program to get a string containing parenthesis '(', ')' (open and closed braces) and other characters. Check whether the brackets in the statement are matching. If the parenthesis in the string matches to form a valid pattern (an open brace should have a matching closed brace following it), print the same string as output. If the parenthesis does not match, then remove the unmatched / unwanted parenthesis and print the result string. Note that the input string will also contain characters enclosed within the open and closed braces.

Note: There will not be any spaces in between the characters / symbols (It is given in these examples for clarity only).

Sample Input 1:

(O)

Sample Output 1:

(O)

Sample Input 2:

((a)(bb)(c))

Sample Output 2:

((a)(bb)(c))

Sample Input 3:

))((a))

Sample Output 3:

((a))

Explanation:

The first two closing braces are not required.

Sample Input 4:

(good)((bad)(better)(wow))

Sample Output 4:

(good)(bad)(better)(wow))

Sample Input 5:

((good)((bad)(better)(wow)))

Sample Output 5:

(good)((bad)(better)(wow)))

LUCKY NUMBER

A number is considered lucky if it contains either 3 or 4 or 3 and 4 both in it. Write a program to print the nth lucky number. Example, 1st lucky number is 3, and 2nd lucky number is 4 and 3rd lucky number is 33 and 4th lucky number is 34 and so on. Note that 13, 40 etc., are not lucky as they have other numbers in it.

The program should accept a number 'n' as input and display the nth lucky number as output.

Sample Input 1:

3

Sample Output 1:

33

Explanation:

Here the lucky numbers are 3, 4, 33, 34., and the 3rd lucky number is 33.

Sample Input 2:

34

Sample Output 2:

33344

POWER OF 2

Write a program to find the minimum number of powers of 2 (sum of all those numbers) that are required to form the given input number and print those numbers.

Constraint: Input vary from 1 to 1024

Example: To make a sum of 10, 2 power 3 (8) and 2 power 1 (2) are required.

Sample Input 1:

10

Sample Output 1:

Count of Numbers required: 2
The Powers of 2 are: 8, 2

Sample Input 2:

12

Sample Output 2:

Count of Numbers required: 2
The Powers of 2 are: 8, 4

Sample Input 3:

20

Sample Output 3:

Count of Numbers required: 2
The Powers of 2 are: 16, 4

VALIDATE STATEMENT

Write a program to validate whether the given statement is valid or not. The statement can contain the characters a-z, numbers 0-9, the operator symbols +, -, *, / and parenthesis '(' and ')' only.

A valid statement would be like: $(a+b)*(c+(d-e/f))$

Following statements are sample invalid statements:

- 1) $(a+)$ or 2) $(a**b)$ or 3) $(a+b/4$ etc.,

Sample Input 1:

$(a+b+c)$

Sample Output 1:

Valid

Sample Input 2:

$a+b*(c-d)$

Sample Output 2:

Valid

Sample Input 3:

$ab+c$

Sample Output 3:

Invalid

Sample Input 4:

$(a+b))$

Sample Output 4:

Invalid

Sample Input 5:

$(+a)$

Sample Output 5:

Invalid

PAIR NUMBER

Goel is the smartest boy in his college. In order to find the 2nd smartest person he gives a puzzle. The task of the puzzle is simple. He gives a set of numbers which are pair numbers.

A pair number is one which can be represented as (2, 2) In that he randomly picks a number of his choice.

(NOTE: The choice number is not present in that array i.e., the choice number is present only once in that array)

Your task is to find the choice number or the missing number.

Inputs:

T - Number of test cases $1 \leq T \leq 10$

N - Number of elements in the array (always odd) $1 \leq N \leq 100000$

Next line contains array elements

Output :

Single integer: Answer to the problem.

Sample Input:

```
1
6
1 3 4 1 9 4 3
```

Sample Output:

```
9
```

Explanation:

For test case 1: (1, 1) (3, 3) (4, 4) are pair numbers. Random number picked by Goel is 9 pair number of 9 is missing. so 9 is the required answer.

PARTICLES

There are K nuclear reactor chambers labelled from 0 to K-1. Particles are bombarded onto chamber 0. The particles keep collecting in the chamber 0. However if at any time, there are more than N particles in a chamber, a reaction will cause 1 particle to move to the immediate next chamber(if current chamber is 0, then to chamber number 1), and all the particles in the current chamber will be destroyed and same continues till no chamber has number of particles greater than N. Given K,N and the total number of particles bombarded (A), find the final distribution of particles in the K chambers. Particles are bombarded one at a time. After one particle is bombarded, the set of reactions, as described, take place. After all reactions are over, the next particle is bombarded. If a particle is going out from the last chamber, it has nowhere to go and is lost.

Input

The input will consist of one line containing three numbers A,N and K separated by spaces.

A will be between 0 and 1000000000 inclusive.

N will be between 0 and 100 inclusive.

K will be between 1 and 100 inclusive.

All chambers start off with zero particles initially.

Output

Consists of K numbers on one line followed by a newline. The first number is the number of particles in chamber 0, the second number is the number of particles in chamber 1 and so on.

Example

Sample Input:

3 1 3

Sample Output:

1 1 0

Explanation

Total of 3 particles are bombarded. After particle 1 is bombarded, the chambers have particle distribution as "1 0 0". After second particle is bombarded, number of particles in chamber 0 becomes 2 which is greater than 1. So, num of particles in chamber 0 becomes 0 and in chamber 1 becomes 1. So now distribution is "0 1 0". After the 3rd particle is bombarded, chamber 0 gets 1 particle and so distribution is "1 1 0" after all particles are bombarded one by one.

COIN PROBLEM

Sanskar have some coins with him each has different values. He wants to find gifts to his girlfriend for his valentines' day. Since the shopkeeper is too busy with his customers he won't give back any change to him.

Find the number of ways he can give money to the shopkeeper for the gift without any loss.

Input:

First line contain N.

Next line contain N integers denoting the value of each coin.

Next line contain the cost of the gift.

Output:

The total number of ways Sanskar can pay the shopkeeper.

Sample Input:

```
7  
1 2 3 3 4 5  
6
```

Sample Output :

```
5
```

Explanation :

$(1+2+3) (1+2+3) (1+5) (3+3) (2+4)$

GCD

Your task is simple.

Find the GCD of 2 numbers.

Input:

$x, y \ 1 \leq x, y \leq 1000000000$

Output:

GCD of x, y . (required answer)

Example

Sample Input:

2
2 6
10 11

Sample Output:

2
1

ANAGRAM

Two Strings S1, S2 are passed as input to the program. The program must print the count of anagrams present in both the strings. Out of each pair of words in the anagram the first word in the pair must be in the S1 and the second word in the pair must be in S2.

If two words have the same characters and the occurrence number of each character is also identical respectively, they are anagrams.

Example:

silent & listen

Input Format:

The first line will contain the value of S1.

The second line will contain the value of S2.

Boundary Conditions:

Length of S1 and S2 is from 5 to 200.

Output Format:

The count of pair of anagrams in S1 and S2 based on the conditions mentioned.

Example Input / Output 1:

Input:

but i will not listen to him
water dropped into the silent tub

Output:

2

Explanation:

The anagram pairs are

but tub
listen silent

NUMBER COUNT

A set of N numbers (separated by one or more spaces) is passed as input to the program. The program must identify the count of numbers where the number on the left is twice the number on the right.

Input Format:

The first line will contain the N numbers separated by one or more spaces.

Boundary Conditions:

$3 \leq N \leq 50$

The value of the numbers can be from -99999999 to 99999999

Output Format:

The count of numbers where the sum of the numbers on the LHS is twice that of the sum of numbers on the RHS.

Example Input / Output 1:

Input:

10 20 5 40 15 -2 30 -1 60

Output:

2

Explanation:

The numbers meeting the criteria are 20, -30

Example Input / Output 2:

Input:

5 90 10 2 5 -4 10 6 5 3

Output:

3

Explanation:

The numbers meeting the criteria are 2, 6, 5

SUM OF NON-EDGES

A set of numbers forming a matrix $N \times N$ is passed as input. The program has to print the sum of numbers which are not along the edges.

Input Format:

The first line will contain the value of N

The next lines will contain N numbers each separated by one or more spaces

Boundary Conditions:

$3 \leq N \leq 10$

Value of a given number in the matrix is from 0 to 99999999

Output Format:

The sum of the numbers which are not along the edges.

Example Input / Output 1:

Input:

```
3
5 6 7
8 9 1
2 3 4
```

Output:

```
9
```

Explanation:

All numbers except 9 are along the edges. Hence the sum is 9 which is printed as output.

PETROL

A man his driving car from home to office with X petrol. There are N numbers of petrol bunks in the city with only few capacities and each petrol is located in different places. For one km one liter will consume. So he fill up petrol in his petrol tank in each petrol bunks. Output the remaining petrol if he has or tell him that he cannot travel if he is out of petrol.

Input Format:

The first line will contain the petrol in car.

The next line will contain petrol bunks named A to Z. separated by one or more spaces.

The next line will contain distance from each petrol bunks.

The next line will contain capacities of each petrol bunk.

Sample Input:

```
2
A B C
1 5 3
6 4 2
```

Sample Output:

```
5
```

ARRAY GROUP

To find the number of groups in an array.

Explanation: To find the sum of the elements in the groups and that sum should be divisible by input X and the groups should be limited to range with X numbers.

If X is 3, then the group should have only 2 elements and 3 elements from the array whose sum is divisible by 3.

Input Format:

The first line will contain the array.

The next line will contain the value of X.

Sample Input:

3 9 7 4 6 8
3

Sample Output:

4

Explanation:

3, 9
3, 6
9, 6
3, 9, 6

ALPHABET LETTER

To output the given string for the given input which is an integer.

Input: 1

Output: A

Input: 26

Output: Z

Input : 27

Output: AA

Input: 28:

Output: AB

Input: 1000

Output: ALL