

Problems on Arrays

Problem 1: Arranging the closing price of stock market.

- You are given an array of size **N**. Rearrange the given array in-place such that all the negative numbers occur before positive numbers.(Maintain the order of all -ve and +ve numbers as given in the original array).
- **Input:**
The first line contains the size of the array denoted by **N**. Then in the next line are N space separated elements of the array.
- **Output:**
Print the array after rearranging with spaces between the elements of the array.
- **Constraints:**
 $1 \leq T \leq 100$
 $1 \leq N \leq 10^7$
 $-10^{18} \leq \text{Elements of array} \leq 10^{18}$

- **Example:**

Input 1:

4

-2 3 -3 2

Input 2:

5

2 -4 7 -3 4

Output 1:

-2 -3 3 2

Output 2:

-4 -3 2 7 4

- **Explanation:**

Testcase 1: In the given array, negative numbers are -2, -3 and positive numbers are 3, 2.

Problem 2: Array of alternate +ve and -ve no.s

- Given an unsorted array of positive and negative numbers. Your task is to create an array of alternate positive and negative numbers without changing the relative order of positive and negative numbers.
- **Input:**
First line contains N, size of array. The subsequent line contains N array elements.
- **Output:**
Print the modified array.
Note: Array should start with positive number.
- **Constraints:**
 $1 \leq T \leq 100$
 $1 \leq N \leq 10^7$
 $-10^6 \leq a[] \leq 10^7$
- **Example:**
Input:
9
9 4 -2 -1 5 0 -5 -3 2
Output:
9 -2 4 -1 5 -5 0 -3 2

Problem 3: Majority Element

- For this challenge, you need to take integer as input on one line which will tell number of array elements and array elements as an input on another line and find the majority number and print that number to the stdout. If not found return -1. (Majority Element: A majority element in an array $A[]$ of size n is an element that appears more than $n/2$ times.)

Input 1:

9

11 11 11 11 23 11 24 13 55

Output 1:

11

Input 2:

3

1 2 3

Output 2:

No majority element

Problem 4

N bulbs are connected by a wire. Each bulb has a switch associated with it, however due to poor wiring, a switch also changes the state of all the bulbs to the right of current bulb. Given an initial state of all bulbs, find the minimum number of switches you have to press to turn on all the bulbs. You can press the same switch multiple times.

NOTE - 0 represents the bulb is OFF and 1 represents the bulb is ON.

Input Format:

First line contains an integer n. An array of N numbers consisting of only 0 and 1.

Output Format:

Display the minimum number of time one need to press the switch to satisfy the given.

Input 1 :

4
1 0 1 1

Output 1:

2

Input 2:

14
1 0 1 1 1 0 1 1 1 1 0 0 1 0

Output 2:

7

Input 3:

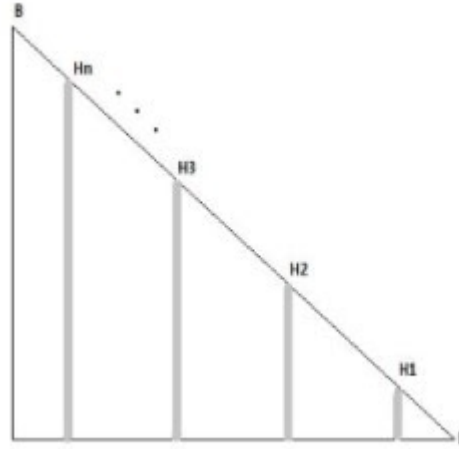
6
1 0 1 1 0 0

Output 3:

3

Problem 5

A man is doing an experiment with the device that he built newly. The structure of the device is as below diagram.



B to E is a sloping surface with n holes, labelled H_1, H_2, \dots, H_n , on it. Holes are of different diameters and depths. The man is releasing m number of balls of different diameters from the point B one after the other.

He needs to find the positions of each ball after the experiment.

The specialities of the device are :

A ball will fall into the hole, if its diameter is less than or equal to the diameter of the hole.

A hole H_i will become full, if i numbers of balls fall into it. For example hole labelled H_3 will become full if 3 balls

If a hole is full, then no more balls fall into it.

Problem 5

A ball will reach the bottom point E from B, if and only if it is not falling into any of the holes.

Please help him in finding the eventual position of the balls. If a ball is in hole P_i , then take its position as i . If a ball reached the bottom point E, then take its position as 0.

Input

Line 1 : total number of holes, N

Line 2 : N space separated integers denoting the diameters of N holes, from bottom to top.

Line 3 : total number of balls, M .

Line 4 : M space separated integers denoting diameters of balls in the order of release.

Output

Line 1 : Positions of each ball in the order of ball release separated by space.

Testcase

Input

```
3
21 3 6
11
20 15 5 7 10 4 2 1 3 6 8
```

Output

```
1 0 3 0 0 3 3 2 2 0 0
```


Problem 6

You have been given 'N' number of spherical Balloons of different radius when filled. You have to fill one balloon per day and the last balloon will be filled on Nth day. There is some rate of air reduction 'K' per day from each balloon. Fill the balloons in such an order so that the sum of the volume of all the balloons is maximum on the day when all the balloons are filled.

Input Format: First Line is an integer N giving the number of balloons. Second line gives space separated N positive real numbers with up to 1 decimal place giving the radii of the balloons. Third line gives K, the rate of reduction in the volume of air as a percentage.

Output Format: Maximum sum of volumes of all the balloons on the Nth day when all the balloons are filled. Take 3.14 as the value of PI and give the answer to two decimal places (truncated by ignoring all the decimals from third onwards). Note that the truncation should happen only after computing the volume of all the balloons on the final day to maximum precision.

Problem 6

Constraints:

Number of balloons ≤ 10 Radius of balloons ≤ 200

Example 1

Input

5

8 4 6 10 3

1 0

Output

7117.88

Explanation

If we fill the balloons in the order 3, 4, 6, 8, 10, their volumes on the fifth day are respectively 7 4.165544 1 95.33312 7 32.4992 1929.216 4 186.666667 And their sum is 7117.880531.

Truncating the value two decimal places, we obtain 7117.88