

# Day 0: Mean, Median, and Mode

## Objective

In this challenge, we practice calculating the mean, median, and mode. Check out the [Tutorial](#) tab for learning materials and an instructional video!

## Task

Given an array,  $X$ , of  $N$  integers, calculate and print the respective mean, median, and mode on separate lines. If your array contains more than one modal value, choose the numerically smallest one.

**Note:** Other than the modal value (which will always be an integer), your answers should be in decimal form, rounded to a scale of **1** decimal place (i.e., **12.3**, **7.0** format).

## Input Format

The first line contains an integer,  $N$ , denoting the number of elements in the array.

The second line contains  $N$  space-separated integers describing the array's elements.

## Constraints

- $10 \leq N \leq 2500$
- $0 < x_i \leq 10^5$ , where  $x_i$  is the  $i^{th}$  element of the array.

## Output Format

Print **3** lines of output in the following order:

1. Print the mean on a new line, to a scale of **1** decimal place (i.e., **12.3**, **7.0**).
2. Print the median on a new line, to a scale of **1** decimal place (i.e., **12.3**, **7.0**).
3. Print the mode on a new line; if more than one such value exists, print the numerically smallest one.

### Sample Input

```
10
64630 11735 14216 99233 14470 4978 73429 38120 51135 67060
```

### Sample Output

```
43900.6
44627.5
4978
```

### Explanation

#### Mean:

We sum all  $N$  elements in the array, divide the sum by  $N$ , and print our result on a new line.

$$\mu = \frac{x_0 + x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 + x_8 + x_9}{10} = \frac{439006}{10} = 43900.6$$

#### Median:

To calculate the median, we need the elements of the array to be sorted in either non-increasing or non-decreasing order. The sorted array  $X = \{4978, 11735, 14216, 14470, 38120, 51135, 64630, 67060, 73429, 99233\}$ . We then average the two middle elements:

$$median = \frac{x_4 + x_5}{2} = \frac{89255}{2} = 44627.5$$

**Mode:**

We can find the number of occurrences of all the elements in the array:

```
4978 : 1
11735 : 1
14216 : 1
14470 : 1
38120 : 1
51135 : 1
64630 : 1
67060 : 1
73429 : 1
99233 : 1
```

Every number occurs once, making **1** the maximum number of occurrences for any number in **X**. Because we have multiple values to choose from, we want to select the smallest one, **4978**, and print it on a new line.

In [ ]: *# Enter your code here. Read input from STDIN. Print output to STDOUT*

```
n = int(input())
x = input()
sum = 0

x = x.split(' ')
x_int=[]
x_dict = {}

for i in x:
    x_int.append(int(i))
    if(x_dict.get(int(i)) == None):
        x_dict.update({int(i):1})
    else:
        count = int(x_dict.get(int(i)))
        x_dict.update({int(i):count+1})

x_int.sort()
```

```

### MEAN CALCULATION ###

for i in x_int:
    sum = sum + i

mean = sum/n


#### MEDIAN CALCULATION ####
center = n/2
center = int(center)
#print(center)
if(n%2 == 0):
    median = (x_int[center]+x_int[center-1])/2
else :
    median = x_int[center]


### MODE CALCULATION ###
mode_count = 0
mode = 999999999
for k in x_dict.keys():
    if(x_dict[k]>mode_count):
        mode_count=x_dict[k]
        mode = k
    elif(x_dict[k] == mode_count):
        if(k<mode):
            mode=k

print(round(mean,1))
print(round(median,1))
print(round(mode,1))

```