

# 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 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:

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

and print our result on a new line.

### 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.