

## 10883 Supermean

*“I have not failed. I’ve just found 10,000 ways that won’t work.”*

Thomas Edison

Do you know how to compute the mean (or average) of  $n$  numbers? Well, that’s not good enough for me. I want the supermean! “What’s a supermean,” you ask? I’ll tell you. List the  $n$  given numbers in non-decreasing order. Now compute the average of each pair of adjacent numbers. This will give you  $n - 1$  numbers listed in non-decreasing order. Repeat this process on the new list of numbers until you are left with just one number - the supermean. I tried writing a program to do this, but it’s too slow. :- ( Can you help me?

### Input

The first line of input gives the number of cases,  $N$ .  $N$  test cases follow. Each one starts with a line containing  $n$  ( $0 < n \leq 50000$ ). The next line will contain the  $n$  input numbers, each one between  $-1000$  and  $1000$ , in non-decreasing order.

### Output

For each test case, output one line containing ‘Case # $x$ :’ followed by the supermean, rounded to 3 fractional digits.

### Sample Input

```
4
1
10.4
2
1.0 2.2
3
1 2 3
5
1 2 3 4 5
```

### Sample Output

```
Case #1: 10.400
Case #2: 1.600
Case #3: 2.000
Case #4: 3.000
```