

Rolling Median

time limit per test: 2 seconds
memory limit per test: 488.3 megabytes
input: standard input
output: standard output

points: 1 · problem code: rollingmedian · author: jszqlew

Problem Statement

You are given a list x of n integers $x = [x_1, x_2, \dots, x_n]$.

You wish to determine the median for each prefix of x . For example given $[1, 2, 9, 7]$, you want to determine:

- The median of $[1]$, then
- The median of $[1, 2]$, then
- The median of $[1, 2, 9]$, then
- The median of $[1, 2, 9, 7]$

Input Format

Your first line of input will contain a single integer n . Your next line will contain n integers space-separated representing x .

Output Format

You should output n space-separated integers representing the median of each prefix of x .

Constraints

- $1 \leq n \leq 10^5$
- $-10^9 \leq x_i \leq 10^9$

Sample Cases

Input 1

```
10
1 2 9 7
```

Output 1

```
1 1.5 2 5.5
```

Explanation 1

There are 7 integers less than 14, being $-2, 1, 2, 4, 5, 6, 10$. There are 4 integers less than 5, being $-2, 1, 2, 4$. There are 6 integers less than 7, being $-2, 1, 2, 4, 5, 6$.