

Statistics Applied

In this problem we will be looking for medians of data set. Median is the central element in ordered data group. For example: for the set {2,6,3,3,2} the median would be 3. In general, if we have n elements $\{a_1, a_2, a_3 \dots a_n\}$, we define the median as element $a_{(n+1)/2}$ if n is odd and $(a_{n/2} + a_{n/2+1})/2$ otherwise.

You will be given N numbers and you must calculate N medians. i -th median is taken on the subset $[a_1, a_2, a_3, \dots, a_i]$ for $1 \leq i \leq N$.

Input

The first line contains the number of test cases. Each case consists of an integer N ($1 \leq N \leq 100000$). N integers a_i ($0 \leq a_i < 2^{31}$) follow, elements in data set.

Output

For each case, print N lines with the medians. If the result is non-integral, print the exact value using decimal point (see example).

Example

Input:

```
2
4
3 5 7 3
2
3 4
```

Output:

```
3
4
5
4
3
3.5
```