Problem J. Statistics Applied

Time limit	1000 ms
Mem limit	1572864 kB
Code length Limit	50000 B
OS	Linux

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 {a1, a2, a3 ... an}, 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 $[a_1, a_2, a_3, .., a_i]$ for 1 <= i <= N.

Input

The first line contains the number of test cases. Each case consists of an integer N (1 <= N <= 100000). N integers a_i (0 <= 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
```