

Self Describing Sequence

Time limit: 1 sec

The "Self Describing Sequence" is an infinite *non-decreasing* sequence of positive integers a_1, a_2, a_3, \dots such that there are exactly a_i instances of the number i in the sequence. The first few members of the sequence are listed as follows.

a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}
1	2	2	3	3	4	4	4	5	5

Your task is to find the value of a_i , for a given value of i .

Input

- The first line of input contains an integer N ($1 \leq N \leq 1000$) indicating the number of indices i of the element of the self describing sequence.
- The following N lines each containing an index x_i of the sequence.
($1 \leq x_i \leq 2\,000\,000\,000$)

Output

The output must contain exactly N lines, each line gives the value of a_{x_i}

Example

Input	Output
3 2 4 10	2 3 5
4 100 9999 123456 1000000000	21 356 1684 438744