Self Describing Sequence

Time limit: 1 sec

The "Self Describing Sequence" is an infinite *non-decreasing* sequence of positive integers $a_1, a_2, a_3, \ldots$ 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 integers **N** $(1 \le N \le 1000)$ indicating the number of indices **i** of the element of the self describing sequence.
- The following N lines each containing and index $\mathbf{x_i}$ of the sequence. $(1 \le x_i \le 2000000000)$

Output

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

Example

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