

Self Describing Sequence

Problem Code	hw03c_sds
Running Time Limit	1 sec
Memory Limit	16 mb

Objective

- Be able to solve a problem using divide & conquer technique or better

Introduction

A 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

In this problem, we wish to know the value of a_x

Task

Your task is to read several indices of the sequence and calculate the value of the respective elements in the sequence.

Input

The first line of input contains a number N ($1 \leq N \leq 1000$) indicating the number of indices. It is followed by N lines each containing an index of the sequence x_i ($1 \leq x_i \leq 2,000,000,000$).

Output

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

Example

Ex1

Input	Output
3	2
2	3
4	5
10	

Ex2

Input	Output
4	21
100	356
9999	1684
123456	438744
1000000000	