Building Pyramid 2

This is a continue problem of http://www.spoj.com/EIUDISC2/problems/EIUCUBES/

Before building the pyramid, Beo went to check the number of bricks. Beo discovered that there were k different types of bricks that could not be used together. Bao decided to build k pyramids, each pyramid using only one type of brick

For each type of brick, help Beo calculate how tall the pyramid is

Input

Consist of 1 line, the first number is k ($1 \le k \le 1000$). then followed by k integers n_i ($1 \le n_i \le 10^{18}$), which is the number of bricks of type i

Output

Output the result in one line, containing k integers corresponding to the height of the ith pyramid

Example

Input:
10 106 999 957 24 873 571 658 248 173 600

Output:
7 17 16 4 16 14 14 10 9 14