Down to Zero II



You are given $m{Q}$ queries. Each query consists of a single number $m{N}$. You can perform any of the $m{2}$ operations on $m{N}$ in each move:

- 1: If we take 2 integers a and b where N=a imes b(a
 eq 1 , b
 eq 1), then we can change N=max(a,b)
- 2: Decrease the value of $oldsymbol{N}$ by $oldsymbol{1}$.

Determine the minimum number of moves required to reduce the value of N to 0.

Input Format

The first line contains the integer $oldsymbol{Q}$.

The next Q lines each contain an integer, N.

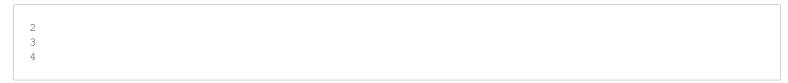
Constraints

$$1 \le Q \le 10^3$$
$$0 \le N \le 10^6$$

Output Format

Output $oldsymbol{Q}$ lines. Each line containing the minimum number of moves required to reduce the value of $oldsymbol{N}$ to $oldsymbol{0}.$

Sample Input



Sample Output

3 3

Explanation

For test case 1, We only have one option that gives the minimum number of moves.

Follow $3 \rightarrow 2 \rightarrow 1 \rightarrow 0$. Hence, 3 moves.

For the case 2, we can either go $4 \to 3 \to 2 \to 1 \to 0$ or $4 \to 2 \to 1 \to 0$. The 2nd option is more optimal. Hence, 3 moves.