

Product of factorials (easy)

For n positive integer, let $F(n) = 1! \times 2! \times 3! \times 4! \times \dots \times n!$, product of factorial(i) for i in $[1..n]$.

Let $G(n) = \{i \text{ in } [1..n], \text{ such that } n \text{ divides } F(i)\}$.

It is obvious that n belongs to $G(n)$ that makes it a non empty set.

Input

The first line of input contains an integer T , the number of test cases.

On each of the next T lines, you are given an integer n .

Output

For each test case, you have to print $\min(G(n))$.

Example

Input:

3
4
5
6

Output:

3
5
3

Explanation

For test case #1:

$F(1) = 1! = 1$, not divisible by 4

$F(2) = 1! \times 2! = 2$, not divisible by 4

$F(3) = 1! \times 2! \times 3! = 12$, **divisible** by 4

$F(4) = 1! \times 2! \times 3! \times 4! = 288$, divisible by 4

So $G(4) = \{3, 4\}$.

Constraints

$0 < T < 10^4$

$0 < n < 10^9$

A little kB of Python code can get AC in half the time limit. (Edit 2017-02-11, after the compiler changes.)

Input is not randomly chosen ;-)
Have fun.