

A. Subtract or Divide

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Ridbit starts with an integer n .

In one move, he can perform one of the following operations:

- divide n by one of its **proper** divisors, or
- subtract 1 from n if n is greater than 1.

A proper divisor is a divisor of a number, excluding itself. For example, 1, 2, 4, 5, and 10 are proper divisors of 20, but 20 itself is not.

What is the minimum number of moves Ridbit is required to make to reduce n to 1?

Input

The first line contains a single integer t ($1 \leq t \leq 1000$) — the number of test cases.

The only line of each test case contains a single integer n ($1 \leq n \leq 10^9$).

Output

For each test case, output the minimum number of moves required to reduce n to 1.

Example

input	Copy
6 1 2 3 4 6 9	
output	Copy
0 1 2 2 2 3	

Note

For the test cases in the example, n may be reduced to 1 using the following operations in sequence

1
 2 → 1
 3 → 2 → 1
 4 → 2 → 1
 6 → 2 → 1
 9 → 3 → 2 → 1

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