

Problem K. Leonardo's Prime Factors

OS Linux

Leonardo loves primes and created q queries where each query takes the form of an integer, n . For each n , count the maximum number of distinct prime factors of any number in the inclusive range $[1, n]$.

Note: Recall that a prime number is only divisible by 1 and itself, and 1 is *not* a prime number.

Example

$n = 100$

The maximum number of distinct prime factors for values less than or equal to 100 is 3. One value with 3 distinct prime factors is 30. Another is 42.

Function Description

Complete the `primeCount` function in the editor below.

`primeCount` has the following parameters:

- `int n`: the inclusive limit of the range to check

Returns

- `int`: the maximum number of distinct prime factors of any number in the inclusive range $[0 - n]$.

Input Format

The first line contains an integer, q , the number of queries.

Each of the next q lines contains a single integer, n .

Constraints

- $1 \leq q \leq 10^5$
- $1 \leq n \leq 10^{18}$

Sample Input

```
6
1
2
```

3
500
5000
10000000000

Sample Output

0
1
1
4
5
10

Explanation

1. **1** is not prime and its only factor is itself.
2. **2** has **1** prime factor, **2**.
3. The number **3** has **1** prime factor, **3**, **2** has **1** and **1** has **0** prime factors.
4. The product of the first four primes is $2 \times 3 \times 5 \times 7 = 210$. While higher value primes may be a factor of some numbers, there will never be more than **4** distinct prime factors for a number in this range.