# Leonardo's Prime Factors

HackerRank

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.