

Problem 2507: Smallest Value After Replacing With Sum of Prime Factors

Problem Information

Difficulty: **Medium**

Acceptance Rate: 49.55%

Paid Only: No

Tags: Math, Simulation, Number Theory

Problem Description

You are given a positive integer n .

Continuously replace n with the sum of its **prime factors**.

* Note that if a prime factor divides n multiple times, it should be included in the sum as many times as it divides n .

Return the smallest value n will take on.

Example 1:

Input: $n = 15$ **Output:** 5 **Explanation:** Initially, $n = 15$. $15 = 3 * 5$, so replace n with $3 + 5 = 8$. $8 = 2 * 2 * 2$, so replace n with $2 + 2 + 2 = 6$. $6 = 2 * 3$, so replace n with $2 + 3 = 5$. 5 is the smallest value n will take on.

Example 2:

Input: $n = 3$ **Output:** 3 **Explanation:** Initially, $n = 3$. 3 is the smallest value n will take on.

Constraints:

$2 \leq n \leq 105$

Code Snippets

C++:

```
class Solution {  
public:  
    int smallestValue(int n) {  
  
    }  
};
```

Java:

```
class Solution {  
    public int smallestValue(int n) {  
  
    }  
}
```

Python3:

```
class Solution:  
    def smallestValue(self, n: int) -> int:
```