2507. Smallest Value After Replacing With Sum of Prime Factors

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User Accepted:	5967
User Tried:	6994
Total Accepted:	6273
Total Submissions:	15113
Difficulty:	Medium

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:

- $2 <= n <= 10^5$

Discuss (https://leetcode.com/problems/smallest-value-after-replacing-with-sum-of-prime-factors/discuss)

JavaScript

```
const sm = (a) => a.reduce(((x, y) => x + y), 0);

const smallestValue = (n) => {
    if (n == 2 || n == 4) return n;
    f = prime_factorization(n), sum = sm(f);
    n = sum;
    while (true) {
        let isPrime = true;
        for (let i = 2; i * i <= n; i++) {
            if (n % i === 0) {
                isPrime = false;
                break;
            }
        }
        if (isPrime) {
            return n;
        } else {
            f = prime_factorization(n), sum = sm(f);
            n = sum;
        }
    }
};

const prime_factorization = (n) => { // 质因式分解
    let res = [];
    while (n % 2 === 0) {
        res.push(2);
```

```
        n /= 2;
    }
    for (let i = 3; i * i <= n; i += 2) {
        while (n % i === 0) {
            res.push(i);
            n /= i;
        }
    }
    if (n > 2) {
        res.push(n);
    }
    return res;
};
```

Custom Testcase | Use Example Testcases

Run | Submit

Submission Result: Accepted (/submissions/detail/861457098/) | More Details > (/submissions/detail/861457098/)

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