Project Euler #88: Product-sum numbers

This problem is a programming version of Problem 88 from projecteuler.net

A natural number, N, that can be written as the sum and product of a given set of at least two natural numbers, $a_1, a_2, \cdots, a_k$, is called a product-sum number:
$$N = a_1 + a_2 + \cdots + a_k = a_1 \times a_2 \times \cdots \times a_k.$$

For example, $6 = 1 + 2 + 3 = 1 \times 2 \times 3$.

For a given set of size, k, we shall call the smallest N with this property a minimal product-sum number. The minimal product-sum numbers for sets of size, $k = 2, 3, 4, 5,$ and 6 are as follows.

$k = 2 : 4 = 2 \times 2 = 2 + 2$
$k = 3 : 6 = 1 \times 2 \times 3 = 1 + 2 + 3$
$k = 4 : 8 = 1 \times 1 \times 2 \times 4 = 1 + 1 + 2 + 4$
$k = 5 : 8 = 1 \times 1 \times 2 \times 2 \times 2 = 1 + 1 + 2 + 2 + 2$
$k = 6 : 12 = 1 \times 1 \times 1 \times 1 \times 2 \times 6 = 1 + 1 + 1 + 1 + 2 + 6$

Hence for $2 \le k \le 6$, the sum of all the minimal product-sum numbers is $4 + 6 + 8 + 12 = 30$; note that 8 is only counted once in the sum.

In fact, as the complete set of minimal product-sum numbers for $2 \le k \le 12$ is $4, 6, 8, 12, 15, 16$, the sum is 61.

What is the sum of all the minimal product-sum numbers for $2 \le k \le N$?

Input Format

First and only line contains an integer N.

Constraints

$10 \le N \le 2 \times 10^5$

Output Format

Print the required answer.

Sample Input

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12
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Sample Output

61