

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, $\{a_1, a_2, \dots, a_k\}$ is called a product-sum number: $N = a_1 + a_2 + \dots + a_k = a_1 \times a_2 \times \dots \times a_k$.

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, $k = 2, 3, 4, 5, \dots$ 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 $2 \leq k \leq 6$, 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 $2 \leq k \leq 12$ is $\{4, 6, 8, 12, 15, 16\}$, the sum is 61 .

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

Input Format

First and only line contains an integer N .

Constraints

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

Output Format

Print the required answer.

Sample Input

12

Sample Output

61