

766 Sum of powers

A young schoolboy would like to calculate the sum

$$S_k(n) = \sum_{i=1}^n i^k$$

for some fixed natural k and different natural n . He observed that calculating i^k for all i ($1 \leq i \leq n$) and summing up results is a too slow way to do it, because the number of required arithmetical operations increases as n increases. Fortunately, there is another method which takes only a constant number of operations regardless of n . It is possible to show that the sum $S_k(n)$ is equal to some polynomial of degree $k + 1$ in the variable n with rational coefficients, i.e.,

$$S_k(n) = \frac{1}{M} \left(a_{k+1}n^{k+1} + a_k n^k + \dots + a_1 n + a_0 \right)$$

for some integer numbers $M, a_{k+1}, a_k, \dots, a_1, a_0$.

We require that integer M be positive and as small as possible. Under this condition the entire set of such numbers (i.e. $M, a_{k+1}, a_k, \dots, a_1, a_0$) will be unique for the given k . You have to write a program to find such set of coefficients to help the schoolboy make his calculations quicker.

Input

The input file contains a single integer k ($1 \leq 20$).

Output

Write integer numbers $M, a_{k+1}, a_k, \dots, a_1, a_0$ to the output file in the given order. Numbers should be separated by one space. Remember that you should write the answer with the smallest positive M possible.

Sample input

2

Sample Output

6 2 3 1 0