Matrix Chain Multiplication

Time limit: 1 sec

Let A be a matrix of size p rows and q columns and B be another matrix of size q rows and r column. The multiplication of A and B takes $\Theta(pqr)$ scalar multiplications. For a sequence of N matrices, $M_1, M_2, \ldots, M_N$ such that their dimensions allow multiplication of Mi and Mi+1, we want to compute their multiplication.

there are several ways to do the multiplication. For example, let **N** = 3 and we have a matrix M_1, M_2, M_3 whose dimensions are $(10 \times 10), (10 \times 10)$ and (10×1). The multiplication $M_1 M_2 M_3$ can be computed as $(M_1 M_2) M_3$ or $M_1 (M_2 M_3)$. Both methods yield the same result but the time used in the multiplication are different, $(M_1 M_2) M_3$ takes 200 scalar multiplications while $M_1 (M_2 M_3)$ takes 1,100 scalar multiplications.

For this problem, we would like to know the minimum number scalar multiplication required to compute $M_1 M_2 \ldots M_N$. The dimension of these matrices are given as a sequence $S = \langle s_0, s_1, s_2, \ldots, s_n \rangle$ such that the number of row and column of matrix M_i is s_{i-1} and s_i respectively. For example, let us assume that $S = \langle 92, 32, 7, 3, 29, 74, 57, 93 \rangle$, the minimum cost of multiplication is achieved by $(M_0 (M_1 M_2))(((M_3 M_4) M_5) M_6)$ and the number of scalar multiplication is 70,167

Your task is to find the minimum number of scalar multiplication required for the given dimensions of the matrices.

Input

There are two lines of input. The first line contains the number of matrices **N** (2 <= N <= 100). The second line contains **N+1** integers describing the sequence **S** that gives the dimensions of the matrices. The dimension of each matrix does not exceed 100.

Output

The output must contain exactly one line containing the minimum number of scalar multiplication required.

Example

Input	Output
3 10 10 10 1	200
7 92 32 7 3 29 74 57 93	70167