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 $(10\times10), (10\times10)$ and (10×1) . The multiplication $M_1M_2M_3$ can be computed as $(M_1M_2)M_3$ or $M_1(M_2M_3)$. Both methods yield the same result but the time used in the multiplication are different, $(M_1M_2)M_3$ takes 200 scalar multiplications while $M_1(M_2M_3)$ takes 1,100 scalar multiplications.

For this problem, we would like to know the minimum number scalar multiplication required to compute $M_1M_2\ldots M_N$. 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 $(M_0(M_1M_2))(((M_3M_4)M_5)M_6)$ and the number of scalar multiplication is 70167

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 giving the giving the length of the longest common subsequence.

Example

Input	Output
3 10 10 10 1	200
7 92 32 7 3 29 74 57 93	41216