

Problem I. Integers and Bracket Sequences

Input file: *standard input*
 Output file: *standard output*
 Time limit: 1 second
 Memory limit: 1024 mebibytes

A string consisting only of parentheses “(” and “)” is called *balanced* if it satisfies one of the following conditions.

- It is an empty string.
- It is a concatenation of two non-empty balanced strings.
- It is a concatenation of “(”, a , and “)” for some balanced string a .

You are given n parentheses s_1, \dots, s_n and n integers c_1, \dots, c_n . Then you have to choose zero or more integers t_1, \dots, t_k so that they satisfy the following conditions:

- $1 \leq t_1 < t_2 < t_3 < \dots < t_k \leq n$.
- The concatenation of $s_{t_1}, s_{t_2}, \dots, s_{t_k}$ is a balanced string.

Note that the above conditions are always satisfied if you choose zero integers.

Your task is to find the maximum possible value of $\sum_{i=1}^k c_{t_i}$.

Input

The first line of input contains a single integer n ($1 \leq n \leq 3 \cdot 10^5$).

The second line consists of n characters $s_1 s_2 \dots s_n$ where each is either “(” or “)”, without any spaces.

The third line contains n integers c_1, c_2, \dots, c_n ($|c_i| \leq 10^9$).

Output

Output a line with a single integer: the maximum possible value of $\sum_{i=1}^k c_{t_i}$ after choosing zero or more integers t_1, \dots, t_k .

Examples

<i>standard input</i>	<i>standard output</i>
5 () (() 3 -9 -2 1 0	3
6) () (() -3 1 -4 1 -5 9	0