NOI '22 Multi-Provincial Team Selection P5 - Bracket

Time limit: 1.0s **Memory limit:** 512M

Tommy has a balanced bracket sequence s of length $2n$, and a weight associated with each opening bracket.

Tommy desires to convert s into a string that does not contain any sequence of the form $(A)(B)$, where A and B are and hereinafter are any balanced bracket sequence. To do this, he can do two operations an arbitrary amount of times:

1. Change the string from $p(A)(B)q$ to $p(A()B)q$, where p and q are and hereinafter are any (possibly unbalanced) bracket sequence. This incurs a cost of x times the weight of the first opening bracket plus y times the weight of the second opening bracket, where x and y are integers given in the input in $\{0, 1\}$.
2. Change the string from $pABq$ to $pBAq$. This incurs no cost. Note that the weights of the opening brackets are changed as they are moved around.

Find the minimum possible cost incurred to convert s into a string that does not contain any substring of the form $(A)(B)$, where A and B are any balanced bracket sequence.

Constraints

$2 \le n \le 4 \times 10^5$

$0 \le x, y \le 1$

$1 \le w_i \le 10^7$

Test	Other restrictions
1 - 3	$n \le 8$
4 - 5	All weights are equal.
6 - 8	$n \le 20$
9 - 12	$x = 0, y = 1$
13 - 16	$n \le 2000$
17 - 25	None.

Input Specification

The first line contains three non-negative integers n, x, and y.

The second line contains a balanced bracket sequence s of length $2n$.

The third line contains n positive integers $w_1, w_2, \ldots, w_n$.

Output Specification

Output the answer.

Sample Input 1

```
2 0 1
()()
1 3
```

Sample Output 1

```
1
```

Sample Explanation 1

The optimal solution is to first use operation 2 to exchange the first and second pair of parentheses. Then, use operation 1 to exchange the inner pair of parentheses, where A, B, p, and q are all empty, incurring a cost of $3 \times 0 + 1 \times 1 = 1$.

Sample Input 2

```
2 1 0
()()
1 3
```

Sample Output 2

```
1
```

Sample Explanation 2

We may use operation 1 directly, incurring a cost of $1 \times 1 + 3 \times 0 = 1$.

Attachments

Attachments can be found here.