Problem E. Eirt Eht Esrever

Time limit: 5 seconds

Vasya plays with his favourite string s of length n. He has a sequence of his favourite numbers, each of the numbers being a rational number $n_i/d_i \in [0, 1]$. For each i from 1 to n, Vasya takes a string equal to the prefix of s of size i, reverses it with probability $1 - n_i/d_i$ and puts the resulting string into a set. He then builds a *trie* (see Notes for the definition) on strings from the set. He asks you to calculate the expected number of vertices in the resulting trie.

Input

The first line of the input contains an integer n, the length of the string ($1 \le n \le 2 \cdot 10^5$). The second line of the input contains a string s of length n consisting of lowercase English letters. The third line contains exactly $|s|$ integers p_i ($0 \le p_i < 998\,244\,353$), where p_i is equal to $n_i d_i^{-1} \mod 998\,244\,353$.

Output

Output a single integer — the answer to the problem modulo 998 244 353. That is, if the expected number of vertices is equal to the irreducible fraction a/b, you should print $ab^{-1} \mod 998\,244\,353$. It can be proven that the answer is rational, and that if the answer in the irreducible form is a/b, then b is not divisible by 998 244 353 under the constraints of this problem.

Examples

standard input	*standard output*
2 aa 324 435	3
2 ab 499122177 499122177	499122180
6 wordle 23 45 67 89 87 65	376824090
7 abacaba 0 1 598946612 332748118 598946612 1 0	266198508
6 banana 0 0 0 0 0 0	16
7 trytrie 1 1 1 1 1 1 1	8

Note

In the first example the set will always consist of two strings, `a` and `aa`, and thus the number of vertices in the trie will always be equal to 3.

In the second example the the set will either be {`a`, `ab`} or {`a`, `ba`}, each with probability 1/2. The expected number of vertices will be equal to 3.5.

A *trie* built on a collection of distinct strings $s_1, \ldots, s_n$ is a special rooted tree with letters written on the edges and some of the vertices being marked. This tree has the following properties:

- All leaves are marked.
- There are exactly n marked vertices.
- No two edges going down from one vertex have the same letter written on them.
- The set of strings obtained by writing down the letters on the paths from the root to the marked vertices coincides with $\{s_1, \ldots, s_n\}$.