Problem K. Knowledge

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	256 mebibytes

You have a string s consisting of lowercase English letters "a" and "b".

You can make zero or more operations in any order. Here are the possible operations:

- Delete "aa" from any place of the string.
- Delete "bbb" from any place of the string.
- Delete "ababab" from any place of the string.
- Add "aa" to any place of the string.
- Add "bbb" to any place of the string.
- Add "ababab" to any place of the string.

Your goal is to calculate the number of strings of length x that can be obtained by such operations. As the answer can be very large, find it modulo 998 244 353.

Input

The first line of the input contains one integer n: the length of the string ($1 \le n \le 300\,000$).

The second line contains a string s of length n consisting of lowercase English letters "a" and "b".

The third line contains one integer x ($0 \le x \le 10^9$), the length of the string you need to obtain.

Output

Print one integer: the number of strings of length x that can be obtained from string s by making the operations described above, taken modulo 998 244 353.

Examples

standard input	standard output
6 ababab 3	1
3 bbb 2	1
5 babab 35	866826000