F First Word

Time limit: 5s



VegiCat has a string S of n lowercase English letters. He wants to build a dictionary that contains k distinct nonempty substrings of S as its words. A substring is a contiguous part of a string. Substrings with the same content are treated as the same word, even if they occur at different positions in S.

Let π be a mapping from the letters $\texttt{a}, \texttt{b}, \ldots, \texttt{z}$ to the corresponding letters in a permutation of the 26 lowercase English letters. For example, the permutation `qwertyuiopasdfghjklzxcvbnm` defines the following mapping:

c	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
$\pi(c)$	q	w	e	r	t	y	u	i	o	p	a	s	d	f	g	h	j	k	l	z	x	c	v	b	n	m

For a string $u = u_1 u_2 \cdots u_m$, define

$$\pi(u) = \pi(u_1)\pi(u_2)\cdots\pi(u_m).$$

For example, with the mapping above, $\pi(\texttt{apple}) = \texttt{qhhst}$.

VegiCat wants the dictionary to contain a word w such that, after applying any such mapping π to every word in the dictionary, $\pi(w)$ is always the lexicographically smallest word in the resulting dictionary.

For each $k = 1, 2, \ldots, n$, find the number of dictionaries that contain k distinct words and satisfy the requirement, modulo 998244353. Two dictionaries are considered different if and only if they contain different sets of words before any mapping is applied.

Recall that string a is lexicographically smaller than string b if a is a prefix of b (and $a \neq b$), or there exists an index i $(1 \le i \le \min(|a|, |b|))$ such that $a_i < b_i$, and for any index j $(1 \le j < i)$ $a_j = b_j$.

Input

The first line contains an integer T $(1 \le T \le 10^4)$, the number of test cases. The description of the test cases follows.

The first line of each test case contains an integer n $(1 \le n \le 10^5)$.

The second line contains a string S of length n, consisting only of lowercase English letters.

It is guaranteed that the sum of n over all test cases does not exceed 10^5.

Output

For each test case, output n integers on one line. The k-th integer represents the number of dictionaries that contain k distinct words and satisfy the requirement, modulo 998244353.

Sample Input 1	Sample Output 1
3 3 aab 4 ppqq 7 abcaabc	5 4 3 8 10 11 10 21 52 87 119 139 128 84

Note

Each dictionary below is written as a set of words.

For the first test case, $S = aab$, the dictionaries that satisfy the requirement for $k = 1, 2, 3$ are:

k	Word sets that satisfy the requirement	Number of dictionaries
1	{a}, {b}, {aa}, {ab}, {aab}	5
2	{a, aa}, {a, ab}, {a, aab}, {aa, aab}	4
3	{a, aa, ab}, {a, aa, aab}, {a, ab, aab}	3

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