

Dictionary

Input file: **standard input**
Output file: **standard output**
Time limit: 4 seconds
Memory limit: 1024 megabytes

You're going to learn words from a dictionary for the next q days. The dictionary is a string $S = s_1s_2 \cdots s_n$ of length n consisting of lower-cased English letters, and a word is a substring of S .

On the i -th day, you will learn all the words which start with $S[l_i : r_i] = s_{l_i}s_{l_i+1} \cdots s_{r_i}$ (that is to say, $S[l_i : r_i]$ is a prefix of these words). After each day, count how many different words you have already learned starting from the first day.

Input

There are multiple test cases. The first line of the input contains an integer T ($1 \leq T \leq 10^4$) indicating the number of test cases. For each test case:

The first line contains a string $s_1s_2 \cdots s_n$ of length n ($1 \leq n \leq 2 \times 10^5$) consisting of lower-cased English letters, indicating the dictionary.

The second line contains an integer q ($1 \leq q \leq 2 \times 10^5$), indicating the number of days you'll learn words.

For the following q lines, the i -th line contains two integers l_i and r_i ($1 \leq l_i \leq r_i \leq n$), indicating that on the i -th day, you will learn all the words with a prefix of $s_{l_i}s_{l_i+1} \cdots s_{r_i}$.

It's guaranteed that neither the sum of n nor the sum of q of all test cases will exceed 2×10^5 .

Output

For each test case, output one line containing q integers c_1, c_2, \cdots, c_q separated by a space, where c_i is the number of different words you have learned from the 1-st day to the i -th day (both inclusive).

Example

standard input	standard output
2	4 6 7
abcabd	3 3 3
3	
1 3	
1 2	
6 6	
aaa	
3	
3 3	
2 3	
1 3	

Note

For the first sample test case:

- On the 1-st day you learned **abc**, **abca**, **abcab**, and **abcabd**. So the answer is 4.
- On the 2-nd day you learned **ab**, **abc**, **abca**, **abcab**, **abcabd**, and **abd**. There are 4 words you have already learned, so the answer is $4 + (6 - 4) = 6$.
- On the 3-rd day you learned **d**, which you haven't learned before. So the answer is $6 + 1 = 7$.

For the second sample test case, you have learned all the words (a, aa, aaa) on the 1-st day, so the answer is always 3.