

Problem I: The Final Substring Showdown

Filename: `showdown`

Time limit: 15 seconds

After Arup beat Christian in their Matching Strings game, with a little help from the campers, Christian, ever the gambler, decided to up the ante. He bet Arup double or nothing to solve a more difficult problem. After all, why limit the substring sizes to a fixed value? Why not just consider all substrings?

Here is Christian's challenge to Arup:

Given a lowercase string s , and a number k , find the number of distinct substrings of s that appear at least k times. A substring is a contiguous sequence of characters from the string, and substrings are considered distinct if any corresponding characters are not equal.

The campers have decided that they would like to claim Arup's money by solving the challenge themselves. Are you up to the task?

Problem

Given a string s and an integer k , count how many distinct substrings of s appear at least k times in s .

Input

Input will begin with a single integer c representing the number of test cases. The first line of each test case will contain a single string, s , representing the string for the case. The second line of each test case will contain a single integer, k , the number of required repetitions for the substrings of s .

Output

For each test case, print a single integer on its own line: the number of distinct substrings of s that appear at least k times.

Input Bounds and Corresponding Credit

30 Points	70 Points
<ul style="list-style-type: none">• $1 \leq c \leq 10$• $2 \leq s \leq 1,000$• $1 \leq k \leq s$	<ul style="list-style-type: none">• $1 \leq c \leq 20$• $2 \leq s \leq 1,000,000$• $1 \leq k \leq s$

Samples

Input	Output
2	7
ababab	2
2	
aaaa	
3	

Sample Explanations

- All substrings of "ababab" that appear at least 2 times: "a", "b", "ab", "ba", "aba", "bab", and "abab"
- Substrings of "aaaa":
 - "a" appears 4 times
 - "aa" appears 3 times
 - "aaa" appears 2 times
 - "aaaa" appears 1 time