D Distinct Substrings 2

Given a string **S** and an integer **K**, another string **T** is obtained by **concatenating S, K times**. How many **distinct substrings** are there in the **string T**?

For example, when **S**="ab", **K**=2: **T**="abab" and there are **7** distinct substrings in the string **T** and they are: "a","b", "ab", " ba", "aba", "bab" and "abab".

Input

First line of input contains an integer **T(< 101)** which is the number of test cases. Each of the following **T** lines contain a string **S** and an integer **K($2 \leq K \leq 10^9$).** The length of **S** is at most **50000** and it consists of **lowercase** letters only and the string is non-empty.

Output

For each test case, output the case number followed by the number of distinct substrings. The input will be such that the result will **always fit into a 64-bit** signed integer number.

Sample Input	Output for Sample Input
3 ab 3 abc 5 aba 4	Case 1: 11 Case 2: 42 Case 3: 32

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