DNA Search

Problem Statement

Given a non-empty string S that consists of symbols from {A,T,C,G}, you are asked to write a program to count the number of occurrences of some given patterns in S.

Input

There are multiple test cases for this problem. The first line of the input gives the total number of test cases. For each test case, the string S will be given first, and then followed by the number of patterns. At the end of each test case, the patterns will be given line by line. There will be an empty line that separates the test cases. There is also an empty line that separate the number of test cases and the first test case.

For each test case, the length of S is at most 100,000. The sum of length of all the patterns in a test case is also bounded by 100,000.

Output

For each test case, output the case number first (i.e., "Case #X") in a single line, followed by K lines, where K is the number of patterns in the test case. For each of the K lines, output a single integer that represents the number of occurrences of the corresponding input pattern.

SAMPLE INPUT	SAMPLE OUTPUT
3	Case #1
	4
ATCGTCATCGGATGCATT	2
2	Case #2
AT	5
CG	4
	3
AAAAA	Case #3
3	5
A	0
AA	
AAA	
CGCGCGCGCG	
2	
CG	
CCC	