IOI Training Camp 2015

Birthday present

It is Cecilia's birthday. Her friend Alexis gave her a string S as her birthday present. S contains only characters from the lower case English alphabet, that is all characters from a to z.

Alexis decided to tease Cecilia. He considers a function f that takes as input a string T and an integer t and $f(T,t)$ returns the number of distinct characters that occurs in T at least t times. Formally, $f(T,t)$ is the cardinality of the set $\{c|c$ occurs at least t times in $T\}$. Note that since T contains only characters a to z, then $f(T,t)$ is at least 0 and atmost 26.

Moreover, Alexis gives Cecilia q integers $t_1,\ldots,t_q$ and asks her, for each t_i, 27 integers defined as follows. For each k in the range $0,1,\ldots,26$, he wants to count the number of substrings T of S, such that $f(T,t_i)=k$.

Formally, Alexis has to find 27 integers for each query t_i. The k-th integer(k is 0-indexed, $0 \le k \le 26$), is the number of substrings T of S such that $f(T,t_i)=k$.

Since Alexis is dumb, he turned to you for help. Please help him tease Cecilia.

Input

The first line of the input contains an integer n, the length of S.
The second line contains S, the string Alexis gave to Cecilia.
The third line of the input contains q, the number of queries.
Next line contains q space separated integers, that is $t_1,t_2,\ldots,t_q$ in that order.

Output

Print q lines. The i-th line, for each $1 \le i \le q$, should contain 27 space-separated integers. The k-th integer, for each $0 \le k \le 26$, should contain the number of substrings T of S such that $f(T,t_i)=k$.

Note:

A substring T of the string $S=a_1a_2\ldots a_n$ is a string of the form $T=a_ia_{i+1}\ldots a_j$ for some $1 \le i \le j \le n$.

Test Data

In all the subtaks, $1 \le t_i \le n$ for all i and $q \le 100$.

Subtask 1 (10 Points): $n \le 100$.

Subtask 2 (30 Points): $n \le 1000$.

Subtask 2 (60 Points): $n \le 10000$.

Sample Input

```
6
aabccc
6
1 2 3 4 5 6
```

Sample Output

```
0 10 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
9 10 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
17 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
21 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
21 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
21 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

Limits

Time: 3 seconds

Memory: 256 MB