

Problem D. Interesting String Problem

Input file: *standard input*
Output file: *standard output*
Time limit: 5 seconds
Memory limit: 1024 mebibytes

JB loves string problems. Here is another interesting string problem created by JB.

Suppose there is a string S , JB will list all the substrings of S . For a substring x , if it occurs multiple times in S , then JB will list it multiple times. After that, JB will sort the strings in the list by lexicographic order, and if two strings are the same, they will be sorted by the positions in S where they occur. After sorting the strings, JB will concatenate the strings by order into one string T .

Now JB will ask you Q queries, each question denoted by one integer k . JB wants you to tell him, for the k^{th} character in string T , where is its position in S ?

Input

The first line contains one string S ($1 \leq |S| \leq 5 \times 10^5$), contains only lowercase letters.

The second line contains one integer Q ($1 \leq Q \leq 5 \times 10^5$).

The following Q lines each contains one integer k ($1 \leq k \leq |T|$).

Output

For each query, output one integer denotes the answer.

Examples

standard input	standard output
p b p b p p b	2
3	4
1	7
2	
3	
potatop	6
3	3
6	4
30	
60	