

## Problem D

# Open Sesame!

Time Limit: 1 second

Memory Limit: 512 megabytes

Archaeologists find treasure buried deep in the Atlantic world. However, this treasure is protected by cryptographic layers and each layer corresponds to a number. After years of research, archaeologists have found a string  $S$  as well as hints to find the password in a mysterious book.

In particular, the  $i^{\text{th}}$  cryptographic stage will have a magic number  $k$ , the cipher being the result of the function  $f(w_k)$  where  $w_k$  is the  $k^{\text{th}}$  alphabetically smallest palindromic substring of  $S$ . The function  $f$  is  $f(p) = \sum_{i=1}^{|p|} (p_i \times a^{l-i}) \bmod m$  where  $p_i$  is the ASCII value of the  $i^{\text{th}}$  character in the string  $p$ ,  $a = 100001$ , and  $m = 10^9 + 7$ .

However, over the years, there will be some blurring places leading to  $w_k$  not existing, then the answer is  $-1$ .

### Input

The first line contains 2 space-separated integers describing the respective values of  $N$  (the length of the string  $S$ ) and  $Q$  (the number of cryptographic layers) ( $N, Q \leq 10^5$ ).

The second line contains a single string denoting  $S$ . It is guaranteed that the string  $S$  consists of only lowercase English alphabetic letters (*i.e.* 'a' to 'z').

Each of the  $Q$  subsequent lines contains a single integer denoting the value of  $K$  for a query ( $K \leq N \times (N + 1)/2$ ).

### Output

For each layer, print the password if the magic number  $K$  in the book is correct. Otherwise, print  $-1$ .

#### Sample Input

#### Sample Output

5 7	97
abcba	97
1	696207567
2	98
3	29493435
4	99
6	-1
7	
8	