

## Problem I. Prefix-free Queries

Input file: *standard input*  
Output file: *standard output*  
Time limit: 2 seconds  
Memory limit: 256 mebibytes

Let  $C(s_1, s_2, \dots, s_k)$  be the number of ways to construct a prefix-free set from the multiset of strings  $s_1, s_2, \dots, s_k$ . A prefix-free set is a set of distinct strings in which there are no two strings such that one of these strings is a prefix of another one. In particular, an empty set is a valid prefix-free set. For example, if for any  $i \neq j$ ,  $s_i$  is not a prefix of  $s_j$ , then  $C(s_1, \dots, s_k) = 2^k$ .

Note that we count not the sets themselves, but the ways to construct such sets: the number of ways to choose a subset of indices out of  $\{1, 2, \dots, k\}$  such that the strings with these indices form a prefix-free set. For example,  $C(\text{"aa"}, \text{"aa"}, \text{"a"}, \text{"a"}) = 5$ : the five ways are to construct an empty set, a set containing the first string, a set containing the second string, a set containing the third string, and a set containing the fourth string.

You are given a string  $s$  consisting of  $n$  lowercase English letters, and  $q$  queries. Let  $s[l, r]$  be the substring  $s_l s_{l+1} \dots s_{r-1} s_r$ . For each query denoted as " $k\ m\ l_1\ r_1\ l_2\ r_2\ \dots\ l_k\ r_k$ ", print one integer: the value  $C(s[l_1, r_1], s[l_2, r_2], \dots, s[l_k, r_k])$ , taken modulo  $m$ .

### Input

The first line contains two integers:  $n$ , the length of  $s$ , and  $q$ , the number of queries to answer ( $1 \leq n \leq 4 \cdot 10^5$ ,  $1 \leq q \leq 4 \cdot 10^5$ ).

The second line contains a string  $s$  of length  $n$  consisting of lowercase English letters.

Next  $q$  lines contain queries, one query per line. Each query has the form " $k\ m\ l_1\ r_1\ l_2\ r_2\ \dots\ l_k\ r_k$ " ( $1 \leq k \leq 4 \cdot 10^5$ ,  $2 \leq m \leq 10^9$ ,  $1 \leq l_j \leq r_j \leq n$ ).

The total sum of all  $k$  over all queries does not exceed  $4 \cdot 10^5$ .

### Output

For each query, print a line containing a single integer: the value  $C(s[l_1, r_1], s[l_2, r_2], \dots, s[l_k, r_k])$ , taken modulo  $m$ .

### Example

standard input	standard output
10 6	5
aabbaacaba	4
4 30 1 2 5 6 10 10 10 10	0
5 20 1 2 3 4 5 6 7 8 9 10	8
1 2 1 10	16
3 20 9 9 7 7 8 8	9
5 20 6 6 7 7 8 8 9 9 10 10	
4 20 1 1 2 2 3 3 4 4	