



G. Yet Another LCP Problem

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Let $LCP(s, t)$ be the length of the longest common prefix of strings s and t . Also let $s[x \dots y]$ be the substring of s from index x to index y (inclusive). For example, if $s = \text{"abcde"}$, then $s[1 \dots 3] = \text{"abc"}$, $s[2 \dots 5] = \text{"bcde"}$.

You are given a string s of length n and q queries. Each query is a pair of integer sets a_1, a_2, \dots, a_k and b_1, b_2, \dots, b_l . Calculate $\sum_{i=1}^k \sum_{j=1}^l LCP(s[a_i \dots n], s[b_j \dots n])$ for each query.

Input

The first line contains two integers n and q ($1 \leq n, q \leq 2 \cdot 10^5$) — the length of string s and the number of queries, respectively.

The second line contains a string s consisting of lowercase Latin letters ($|s| = n$).

Next $3q$ lines contains descriptions of queries — three lines per query. The first line of each query contains two integers k_i and l_i ($1 \leq k_i, l_i \leq n$) — sizes of sets a and b respectively.

The second line of each query contains k_i integers a_1, a_2, \dots, a_{k_i} ($1 \leq a_1 < a_2 < \dots < a_{k_i} \leq n$) — set a .

The third line of each query contains l_i integers b_1, b_2, \dots, b_{l_i} ($1 \leq b_1 < b_2 < \dots < b_{l_i} \leq n$) — set b .

It is guaranteed that $\sum_{i=1}^q k_i \leq 2 \cdot 10^5$ and $\sum_{i=1}^q l_i \leq 2 \cdot 10^5$.

Output

Print q integers — answers for the queries in the same order queries are given in the input.

Example

input	Copy
<pre> 7 4 abacaba 2 2 1 2 1 2 3 1 1 2 3 7 1 7 1 1 2 3 4 5 6 7 2 2 1 5 1 5 </pre>	
output	Copy
<pre> 13 2 12 16 </pre>	

Note

Description of queries:

- In the first query $s[1 \dots 7] = \text{abacaba}$ and $s[2 \dots 7] = \text{bacaba}$ are considered. The answer for the query is

Educational Codeforces Round 53 (Rated for Div. 2)

Finished

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Start virtual contest

→ Problem tags

data structures string suffix structures

*2700

No tag edit access

→ Contest materials

- Announcement
- Tutorial

$$\text{LCP}(\text{abacaba}, \text{abacaba}) + \text{LCP}(\text{abacaba}, \text{bacaba}) + \text{LCP}(\text{bacaba}, \text{abacaba}) + \text{LCP}(\text{bacaba}, \text{bacaba}) = 7 + 0 + 0 + 6 = 13$$

2. In the second query $s[1 \dots 7] = \text{abacaba}$, $s[2 \dots 7] = \text{bacaba}$, $s[3 \dots 7] = \text{acaba}$ and $s[7 \dots 7] = \text{a}$ are considered. The answer for the query is

$$\text{LCP}(\text{abacaba}, \text{a}) + \text{LCP}(\text{bacaba}, \text{a}) + \text{LCP}(\text{acaba}, \text{a}) = 1 + 0 + 1 = 2.$$

3. In the third query $s[1 \dots 7] = \text{abacaba}$ are compared with all suffixes. The answer is the sum of non-zero values:

$$\text{LCP}(\text{abacaba}, \text{abacaba}) + \text{LCP}(\text{abacaba}, \text{acaba}) + \text{LCP}(\text{abacaba}, \text{aba}) + \text{LCP}(\text{abacaba}, \text{a}) = 7 + 1 + 3 + 1 = 12$$

4. In the fourth query $s[1 \dots 7] = \text{abacaba}$ and $s[5 \dots 7] = \text{aba}$ are considered. The answer for the query is

$$\text{LCP}(\text{abacaba}, \text{abacaba}) + \text{LCP}(\text{abacaba}, \text{aba}) + \text{LCP}(\text{aba}, \text{abacaba}) + \text{LCP}(\text{aba}, \text{aba}) = 7 + 3 + 3 + 3 = 16$$

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