Substring Cut and Paste

Time: 1 sec / Memory: 256 MB

Problem Statement

Let $s = s_1\ s_2\ \ldots\ s_n$ be a string of length n. For any $1 \le \ell \le r \le n$, let

$$s_{[\ell,r]} := s_\ell\ s_{\ell+1}\ \ldots\ s_r$$

denote the substring of s formed by characters between ℓ and r. For any $\ell > r$, define $s_{[\ell,r]}$ to be the empty string.

In the cut-and-paste operation on any given segment $[\ell, r]$ with $1 \le \ell \le r \le n$, we cut the substring $s_{[\ell,r]}$ from s and paste it to the end of the string. As a result, the string s becomes

$$s_{[1,\ell-1]}\ s_{[r+1,n]}\ s_{[\ell,r]}.$$

Given a string s, your task is to process a sequence of the cut-and-paste operations and output final string.

For example, if the input string is `AYBABTU`, then after the operation on $[3, 5]$, the string becomes `AYTUBAB`, obtained by moving `BAB` to the end of the string. After the second operation on $[3, 5]$, the string becomes `AYABTUB`.

Input

The first input line has two integers n and m: the length of the string and the number of operations. The characters of the string are indexed by $1, 2, \ldots, n$.

The next line has a string of length n that consists of characters A–Z.

Then, there are m lines that describe the operations. Each line has two integers a and b: the segment $[a, b]$ on which the cut-and-paste operation is to be performed.

Output

Print the final string after all the operations.

Constraints

$1 \leq n \leq 10^6$
$1 \leq m \leq 2 \cdot 10^5$
$1 \leq a \leq b \leq n$

Example

Input 1:

```
7 2
AYBABTU
3 5
3 5
```

Output 1:

```
AYABTUB
```

Input 2:

```
10 10
QNJPEVJUXH
10 10
7 10
2 9
4 4
7 8
5 9
9 10
9 10
5 10
8 8
```

Output 2:

```
QHNPUEVJJX
```