Consider a string of n characters, s, of where each character is indexed from 0 to $n-1$.

You are given q queries in the form of two integer indices: $left$ and $right$. For each query, count and print the number of different substrings of s in the inclusive range between $left$ and $right$.

Note: Two substrings are *different* if their sequence of characters differs by at least one. For example, given the string $s =$ `aab`, substrings $s_{[0,0]} =$ `a` and $s_{[1,1]} =$ `a` are the same but substrings $s_{[0,1]} =$ `aa` and $s_{[1,2]} =$ `ab` are different.

Input Format

The first line contains two space-separated integers describing the respective values of n and q.
The second line contains a single string denoting s.
Each of the q subsequent lines contains two space-separated integers describing the respective values of $left$ and $right$ for a query.

Constraints

- $0 \leq left \leq right \leq n-1$
- String s consists of lowercase English alphabetic letters (i.e., `a` to `z`) only.

Subtasks

- For 30% of the test cases, $1 \leq n, q \leq 100$
- For 50% of the test cases, $1 \leq n, q \leq 3000$
- For 100% of the test cases, $1 \leq n, q \leq 10^5$

Output Format

For each query, print the number of different substrings in the inclusive range between index $left$ and index $right$ on a new line.

Sample Input 0

```
5 5
aabaa
1 1
1 4
1 1
1 4
0 2
```

Sample Output 0

```
1
8
1
8
5
```

Explanation 0

Given $s =$ `aabaa`, we perform the following $q = 5$ queries:

1. `1 1`: The only substring of `a` is itself, so we print 1 on a new line.
2. `1 4`: The substrings of `abaa` are `a`, `b`, `ab`, `ba`, `aa`, `aba`, `baa`, and `abaa`, so we print 8 on a new line.
3. `1 1`: The only substring of `a` is itself, so we print 1 on a new line.
4. `1 4`: The substrings of `abaa` are `a`, `b`, `ab`, `ba`, `aa`, `aba`, `baa`, and `abaa`, so we print 8 on a new line.
5. `0 2`: The substrings of `aab` are `a`, `b`, `aa`, `ab`, and `aab`, so we print 5 on a new line.