

Sub Sub Strings

time limit per test: 1 second (3 seconds for Python)
memory limit per test: 500 megabytes
input: standard input
output: standard output
points: 100 · problem code: subsubstrings

You are given a string s of length n , and must answer q queries.

Each query gives a range $[a, b]$ and asks for the length of the longest contiguous substring inside $s_a s_{a+1} \dots s_b$ that consists of only one repeated character.

For example, given the string `aaabbbb` and the interval $[2, 7]$, the longest such substring is `bbbb`, which has length 4. Positions are 1-indexed.

Input

The first line contains the integers n and q .

The second line contains the string s .

Each of the next q lines contains two integers a and b .

Output

For each query, output a line containing the answer.

Constraints

- $1 \leq n \leq 10^5$
- $1 \leq q \leq 10^4$
- $1 \leq a \leq b \leq n$
- s consists only of lowercase English letters.

Example 1

Input

```
20 10
aaaddddccccaabbccccc
4 9
2 13
13 17
2 8
18 20
18 19
6 7
3 16
17 18
17 19
```

Output

```
4
4
3
4
3
2
2
4
1
2
```