



Task Tornjevi

Dominik is truly a special student and he constantly enjoys playing with blue and red cubes of different sizes.

He decided to build towers while following two peculiar rules:

- A cube directly above another cube can never be the same color as that cube.
- All cubes in the tower above some cube must be smaller in size than that cube.



Dominik opened his toy box which contains exactly n cubes. For each i ($1 \leq i \leq n$), Dominik has exactly one cube of size i , and it is either red or blue.

Dominik got bored of stacking towers, so he came up with q difficult questions. In each question, Dominik thinks of two numbers l and r . He wants to know the **minimum** number of towers he must build so that they contain only cubes whose sizes are between l and r (inclusive), and such that every tower follows his peculiar rules. Every cube of a size between l and r must be used, i.e., placed in some tower.

Dominik has to study a lot because it's time for midterms at the university, so he asks you for help in answering his q questions.

Input

In the first line, there are two natural numbers n and q ($1 \leq n, q \leq 1 \cdot 10^5$), the number of cubes and the number of questions.

In the second line, there is a string s , where the character s_i represents the color of the cube of size i . Each character of the string will be either "P" or "C".

In each of the following q lines, there are two numbers l_i and r_i ($1 \leq l_i \leq r_i \leq n$), the left and right boundaries of Dominik's query.

Output

In q lines, print the answers to Dominik's questions from the problem statement.

Scoring

Subtask	Points	Constraints
1	23	$1 \leq n, q \leq 10$
2	38	$1 \leq n, q \leq 1000$
3	25	There will be at most 20 blue cubes.
4	24	No additional constraints.



Examples

input

```
7 4
PPCPPCC
1 7
1 5
3 7
4 5
```

output

```
3
3
2
2
```

input

```
6 2
CCCCCC
1 6
2 5
```

output

```
6
4
```

input

```
16 1
PPPCPPCCCCPPPPP
1 16
```

output

```
6
```

Clarification of the second example: All the cubes are red, so any tower that contains at least 2 cubes does not follow Dominik's rules. It follows that each tower contains exactly 1 cube, and the answer to each question is the number of cubes between l and r , i.e., $r - l + 1$.