C. Binary String Copying

time limit per test: 2 seconds
memory limit per test: 256 megabytes

You are given a string s consisting of n characters `0` and/or `1`.

You make m copies of this string, let the i-th copy be the string t_i. Then you perform exactly one operation on each of the copies: for the i-th copy, you sort its substring $[l_i; r_i]$ (the substring from the l_i-th character to the r_i-th character, both endpoints inclusive). **Note that each operation affects only one copy, and each copy is affected by only one operation**.

Your task is to calculate the number of different strings among $t_1, t_2, \ldots, t_m$. Note that the initial string s should be counted only if at least one of the copies stays the same after the operation.

Input

The first line contains a single integer t ($1 \le t \le 10^4$) — the number of test cases.

The first line of each test case contains two integers n and m ($1 \le n, m \le 2 \cdot 10^5$) — the length of s and the number of copies, respectively.

The second line contains n characters `0` and/or `1` — the string s.

Then m lines follow. The i-th of them contains two integers l_i and r_i ($1 \le l_i \le r_i \le n$) — the description of the operation applied to the i-th copy.

The sum of n over all test cases doesn't exceed $2 \cdot 10^5$. The sum of m over all test cases doesn't exceed $2 \cdot 10^5$.

Output

Print one integer — the number of different strings among $t_1, t_2, \ldots, t_m$.

Example

input Copy

```
3
6 5
101100
1 2
1 3
2 4
5 5
1 6
6 4
100111
2 2
1 4
1 3
1 2
1 1
0
1 1
```

output Copy

```
3
3
1
```

Note

Consider the first example. Copies below are given in order of the input operations. Underlined substrings are substrings that are sorted:

1. 101100 → 011100;
2. 101100 → 011100;
3. 101100 → 101100;
4. 101100 → 101100;
5. 101100 → 000111.

There are three different strings among t_1, t_2, t_3, t_4, t_5: `000111`, `011100` and `101100`.

Consider the second example:

1. 100111 → 100111;
2. 100111 → 001111;
3. 100111 → 001111;
4. 100111 → 010111.

There are three different strings among t_1, t_2, t_3, t_4: `001111`, `010111` and `100111`.

Educational Codeforces Round 152 (Rated for Div. 2)

Finished

Practice

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
281924684	Sep/20/2024 03:58	Accepted
281923400	Sep/20/2024 03:26	Wrong answer on test 1

→ Problem tags

binary search, brute force, data structures, hashing, strings, *1600

No tag edit access

→ Contest materials

- Announcement
- Tutorial