

Cobweb

Problem ID: cobweb

You are given n cards, the i -th of which has a character c_i written on it. You want to arrange some or all of these cards so that they form a sequence. However, you cannot arrange them arbitrarily, as you are also given $n - 1$ rules in the form of (i, j) , meaning you are allowed to put the i -th card and the j -th card next to each other. It is guaranteed that the given rules will allow you to make a sequence that starts with any card and ends with any card.

Each sequence t you make represents a string $s_t = c_{t_1}c_{t_2}\dots$. You are also given a string s and your goal is to find the number of different sequences you can make out of the cards such that the strings they represent are lexicographically greater than or equal to the given string.

Two sequences a and b are considered different if they have different lengths or $a_i \neq b_i$ for some i where a_i represents the i -th card of sequence a and b_i represents the i -th card in sequence b . Sequences that represent the same string but are made from different cards are considered different.

String a is lexicographically greater than or equal to string b if either b is a prefix of a (possibly $b = a$) or there exists i ($1 \leq i \leq \min(|a|, |b|)$) such that $b_i < a_i$ and for any j ($1 \leq j < i$), $a_j = b_j$. Here $|a|$ denotes the length of the string a .

For example, in the second sample case (pictured below), the given sequence is ah . In the given tree, any sequence starting with an e , h , and f are going to be lexicographically greater than ah , which accounts for 15 sequences. Furthermore, the sequences $a - h - e$ and $a - h - f$ are lexicographically greater than ah and the string $a - h$ is lexicographically equal to ah , so we find a total of 18 sequences that satisfy the given constraints.

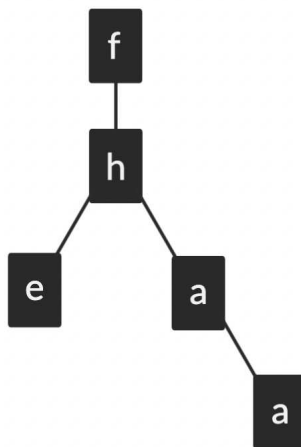


Illustration of Second Sample Case

Input

The first line contains two space-separated integers n ($1 \leq n \leq 2 \cdot 10^5$) and m ($1 \leq m \leq 100$), the number of cards and the length of s respectively.

The second line is the string c of n lowercase latin letters, where c_i is written on the i -th card.

The third line is the string s of length m .

Finally, $n - 1$ lines follow in the format of “ $i j$ ”, each representing a rule (i, j) .

Output

Print the number of sequences that satisfy the given constraints.

Sample Input 1

```
5 3
stoaq
toe
1 4
2 4
2 3
4 5
```

Sample Output 1

```
0
```

Sample Input 2

```
5 2
feaha
ah
1 4
2 4
3 5
4 5
```

Sample Output 2

```
18
```