Problem 4 - Rotating Magic (100 pts)

Problem Description

Remember the magical fairy in the house of Demeter Sphynx Abyssinian (DSA)? The fairy's magic spell can be represented by a string S, consisting of uppercase English alphabets of length of N. Each substring of S is called a segment of the spell, and a segment generates *magic effect* if it is exactly the same as the pattern P, which has a length of M. However, a segment may produce *the opposite effect* if it is a rotation of P. For example, given a string $A(A = c_1c_2...c_n)$ consisting of n alphabets, $c_i...c_n + c_1...c_{i-1}$ is considered a rotation of A, for any $i \in [2, n]$.

To help the fairy debug zir magic spell, can you calculate the total number of segments in zir spell that may generate either the original or the opposite magic effect?

Input

The first line contains two integers N and M. The second line contains the magic spell string S, which has length N. The third line contains the pattern P, which has length M.

Output

Output the answer as an integer in a single line.

Constraints

- $1 \leq M \leq N \leq 10^6$
- S and P consist of only uppercase English letters.

Subtask 1 (10 pts)

- $1 \leq N \leq 10^4$
- $1 \leq M \leq 10^2$

Subtask 2 (15 pts)

- $N = M$

Subtask 3 (25 pts)

- $1 \leq N \times M \leq 2 \times 10^7$

Subtask 4 (50 pts)

- No other constraints.

Sample Testcases

Sample Input 1

```
7 5
DEABCDE
ABCDE
```

Sample Output 1

```
3
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Hints

Explanation of Sample 1:
Substrings of length M in S are $[DEABC, EABCD, ABCDE]$.
The first two are rotations of P and the last one is equal to P.