CCC '20 S3 - Searching for Strings

Time limit: 0.5s **Memory limit:** 512M

Canadian Computing Competition: 2020 Stage 1, Senior #3

You're given a string N, called the needle, and a string H, called the haystack, both of which contain only lowercase letters `a` ... `z`.

Write a program to count the number of distinct permutations of N which appear as a substring of H at least once. Note that N can have anywhere between 1 and $|N|!$ distinct permutations in total – for example, the string `aab` has 3 distinct permutations (`aab`, `aba`, and `baa`).

Input Specification

The first line contains N $(1 \leq |N| \leq 200\,000)$, the needle string.

The second line contains H $(1 \leq |H| \leq 200\,000)$, the haystack string.

For 3 of the 15 available marks, $|N| \leq 8$ and $|H| \leq 200$.

For an additional 2 of the 15 available marks, $|N| \leq 200$ and $|H| \leq 200$.

For an additional 2 of the 15 available marks, $|N| \leq 2\,000$ and $|H| \leq 2\,000$.

Because the original test data were weak, an additional subtask worth 5 marks has been added.

Output Specification

Output consists of one integer, the number of distinct permutations of N which appear as a substring of H.

Sample Input

```
aab
abacabaa
```

Output for Sample Input

```
2
```

Explanation of Output for Sample Input

The permutations `aba` and `baa` each appear as substrings of H (the former appears twice), while the permutation `aab` does not appear.