Submit a solution for A-111498. Substring of a Repeated String

Time limit: 1 s
Real time limit: 5 s
Memory limit: 256M

Problem A: 111498. Substring of a Repeated String

Given two strings A and B. Your task is to find the minimum number of times A has to be repeated such that B is a substring of it. If B cannot be found in A after it's extension, return -1. If A already contains B, the number of repetitions is equal to one by default.

Input format

Input contains two lines, where the first line denotes the string A, and the second line - string B. Input strings contain either lowercase or uppercase letters. Lengths of A and B are between 1 and 10^3.

Output format

Print the minimum number of repetitions of A, such that B is a substring of A.

Examples

Input

```
abcd
cdabcdab
```

Output

```
3
```

Input

```
aaa
a
```

Output

```
1
```

Notes

For the first test case, answer is 3, because by repeating A three times ("abcdabcdabcd"), B is a substring of it. For the second case, we do not extend the string A and B is a substring of A. Number of repetitions of A is 1.

Submit a solution

Language: g++ GNU C++ 7.4.0
File: Choose File | No file chosen

Submit a solution for B-111539. Password

Time limit: 1 s
Real time limit: 5 s
Memory limit: 256M

Problem B: 111539. Password

Thomas received a new password from his employee. Since Thomas always checks the information, he asks you to check if the password is correct.

It is known that the password is correct only if it occurs *at least* K times on a piece of paper that the Bank Director gave to Thomas.

Input format

The first line contains a string s and an integer K ($3 \leq |s| \leq 10^5$, $1 \leq K \leq 10000$), where s is a new password. The second line contains a string T ($3 \leq |T| \leq 10^5$), a string on a piece of paper.

Output format

Print YES if password is correct, otherwise print NO

Examples

Input

```
hello 2
helloThomashelloArthurhelloJohnhello
```

Output

```
YES
```

Input

```
kbtu 4
kbtuIsTheBestPlaceInTheWorld
```

Output

```
NO
```

Submit a solution

Language: g++ GNU C++ 7.4.0

File: Choose File | No file chosen

Send! Send!

Previous submissions of this problem

Submit a solution for C-Cyclic Shift

Time limit: 1 s
Real time limit: 5 s
Memory limit: 256M

Problem C: Cyclic Shift

Tamerlan once wrote on a piece of paper a line consisting of large and small Latin letters, and then went to help Askar. When he returned, he found that his friend Alikhan had written another line of the same length under his line. Alikhan claims that he got his line by cyclic shift of Tamerlan's line a few steps to the right (cyclic shift of qwerty line for 2 positions to the right will give ertyqw line). However, Alikhan is known for the fact that he can accidentally make a mistake in a large number of calculations, so Tamerlan is at a loss – whether to believe Alikhan? Help him! From given line, print the minimum possible shift size or -1 if Alikhan is wrong.

Input format

The first two lines of input data contain Tamerlan and Alikhan lines, respectively. The line lengths are the same, do not exceed 10000 and are not equal to 0.

Output format

Print the single number - the answer to the problem question.

Examples

Input

```
zabcd
abcdz
```

Output

```
4
```

Input

```
abcde
decha
```

Output

```
-1
```

Submit a solution

Language: g++ GNU C++ 7.4.0

File: Choose File No file chosen

Send! Send!

Previous submissions of this problem

Submit a solution for D-109553. Modified exttt{Towns} game

Time limit: 1 s
Real time limit: 5 s
Memory limit: 256M

Problem D: 109553. Modified exttt{Towns} game

One day Olzhas was bored and he wanted to play the game Towns with friends. But the game has been slightly modified. In this game, each participant in his turn calls another real city of any country, the name of which begins with the maximum possible length of suffix, which ends with the name of the city of the previous participant. It was the turn of Olzhas and he should choose the name of the city. Help him with the choice of the name of the city.

Input format

Given string P $(1 \leqslant |P| \leqslant 400)$ - the name of the city of the previous participant.

In the next line given N $(1 \leqslant N \leqslant 10^3)$ - the number of city names that Olzhas know.

Next N lines represent name a_i $(1 \leqslant |a_i| \leqslant 400)$ of the cities. Each city name starts with an uppercase letter and other letters are lowercase.

Output format

The first line should contain integer M - the number of possible names of the cities which could say Olzhas.

Each of the next M lines should consist of the possible names of the cities in the order of their input.

Examples

Input

```
Kokshetau
5
Astana
Tauemel
Tainan
Almaty
Budapest
```

Output

```
1
Tauemel
```

Input

```
Almaty
3
Yacuiba
Yurga
Moscow
```

Output

Submit a solution for E-198309. Chainsaw Man: 13th generation

Time limit: 1 s
Real time limit: 5 s
Memory limit: 256M

Problem E: 198309. Chainsaw Man: 13th generation

After endterm Makima decided to do the problems for the final exam. Do you know what is the hardest thing in making a problem? It is the name of the task.

Makima has a task name draft s. The name of the task must contain a given string as a substring at least k times. But she has a limitation: the name of the task cannot be very long, and she wants to find the shortest one. Help Makima to find the length of the shortest task name satisfying desired condition.

Input format

The first line contains a single integer t — the number of testcases. Each of the next t lines contains string s consisting of only lowercase letters and a number $k (1 \le k \le 10^6)$. The sum of lengths of strings over all testcases will not exceed $5 \cdot 10^5$

Output format

For each test case print answer in separate line.

Examples

Input

```
3
asas 3
aaa 1
b 2
```

Output

```
8
3
2
```

Input

```
5
anime 666
violetevergarden 898
mononoke 24
evangelion 4
nugman 7
```

Output

```
3330
14368
192
40
36
```

Submit a solution for F-147131. Simple KMP

Time limit: 1 s
Real time limit: 5 s
Memory limit: 256M

Problem F: 147131. Simple KMP

Given two strings s_1 and s_2, find whether s_1 is a substring of s_2 and print indices of occurrences.

Input format

Next two lines contain strings s_1 ($1 \leqslant |s_1| \leqslant 10^5$) and s_2 ($1 \leqslant |s_2| \leqslant 10^5$).

Output format

In the first line print a single integer - the number of occurrences of string s_1 in string s_2. In the second line print indices of occurrences.

Examples

Input

```
abacaba
aba
```

Output

```
2
1 5
```

Notes

Solve this task using Knuth-Morris-Pratt algorithm.

Submit a solution

Language: g++ - GNU C++ 7.4.0
File: Choose File | No file chosen
Send! Send!

Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
2026	122:04:17	2247	F	g++	OK	N/A	View	View

Not secure | 78.140.223.58/cgi-bin/new-client?SID=50537cfbfce657a3&action=139&prob_id=7

Submit a solution for G-147128. Another one prefix function problem

Time limit: 1 s
Real time limit: 5 s
Memory limit: 256M

Problem G: 147128. Another one prefix function problem

The string s was written many times in a row, after which a substring was taken from the resulting string and given to you. Your task is to determine the minimum possible length of the original string s.

Input format

The only line contains string S ($0 < |s| \leq 50000$).

Output format

The solution of the task.

Examples

Input

```
zzz
```

Output

```
1
```

Input

```
bcabcab
```

Output

```
3
```

Submit a solution

Language: g++ - GNU C++ 7.4.0

File: Choose File | No file chosen

Send! Send!

Previous submissions of this problem

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
2031	122:18:03	799	G	g++	OK	N/A	View	View

Submit a solution for H-147775. Splitting

Time limit: 2 s
Real time limit: 5 s
Memory limit: 256M

Problem H: 147775. Splitting

Given a string s, calculate the number of ways to divide s into 3 non-empty strings a, b, c such that:

$$a + b + c = S \text{ and } a + c = b + c$$

Input format

You are given the string s ($1 \leq |s| \leq 5 \cdot 10^6$), consisting of small Latin letters.

Output format

Print the number of ways to partite string.

Examples

Input

```
abababcx
```

Output

```
2
```

Notes

String from the first testcase can be partitioned in two ways:
1. *ab + ab + ababcx*
2. *abab + abab + cx*

Submit a solution

Language: g++ - GNU C++ 7.4.0
File: Choose File No file chosen
Send! Send!

Previous submissions of this problem (last 15)

Run ID	Time	Size	Problem	Language	Result	Failed test	View source	View report
3020	167:24:29	1858	H	g++	OK	N/A	View	View