Problem B
Repeated Substitution with Sed
Input: B.in

Do you know "sed," a tool provided with Unix? Its most popular use is to substitute every occurrence of a string α contained in the input string (actually each input line) with another string β. More precisely, it proceeds as follows.

1. Within the input string, every non-overlapping (but possibly adjacent) occurrences of α are marked. If there is more than one possibility for non-overlapping matching, the leftmost one is chosen.
2. Each of the marked occurrences is substituted with β to obtain the output string; other parts of the input string remain intact.

For example, when α is "`aa`" and β is "`bca`", an input string "`aaxaaa`" will produce "`bcaxbcaa`", but not "`aaxbcaa`" nor "`bcaxabca`". Further application of the same substitution to the string "`bcaxbcaa`" will result in "`bcaxbcbca`", but this is another substitution, which is counted as the second one.

In this problem, a set of substitution pairs (α_i, β_i) $(i = 1, 2, \ldots, n)$, an initial string γ, and a final string δ are given, and you must investigate how to produce δ from γ with a minimum number of substitutions. A single substitution (α_i, β_i) here means simultaneously substituting all the non-overlapping occurrences of α_i, in the sense described above, with β_i.

You may use a specific substitution (α_i, β_i) multiple times, including zero times.

Input

The input consists of multiple datasets, each in the following format.

n
α_1 β_1
α_2 β_2
$\vdots$
α_n β_n
γ
δ

n is a positive integer indicating the number of pairs. α_i and β_i are separated by a single space. You may assume that $1 \leq |\alpha_i| < |\beta_i| \leq 10$ for any i ($|s|$ means the length of the string s),

$\alpha_i \neq \alpha_j$ for any $i \neq j$, $n \leq 10$ and $1 \leq |\gamma| < |\delta| \leq 10$. All the strings consist solely of lowercase letters. The end of the input is indicated by a line containing a single zero.

Output

For each dataset, output the minimum number of substitutions to obtain δ from γ. If δ cannot be produced from γ with the given set of substitutions, output -1.

Sample Input

```
2
a bb
b aa
a
bbbbbbbb
1
a aa
a
aaaaa
3
ab aab
abc aadc
ad dee
abc
deeeeeeeec
10
a abc
b bai
c acf
d bed
e abh
f fag
g abe
h bag
i aaj
j bbb
a
abacfaabe
0
```

Output for the Sample Input

```
3
-1
7
4
```