Wildcard and Query

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

You are given a string S consisting of lowercase letters of the English alphabet.

A string T consisting of English lowercase letters and "*"is considered to **match** S when the following condition is satisfied.

- S can be made from T by replacing each "*"with an arbitrary string of length 0 or greater.

For example, "a*b"**match**es "ab "acb and "aabb"but does not **match** "abc".

A **match** is considered **unique** if the following condition is satisfied.

- There is only one possible way of replacing each "*"in T to make S.

For example, "a*b*c"**unique**ly **match**es "abc"and "axbxc"but does not **unique**ly **match** "abbc". This is because you can replace the first "*"with "b"and the second "*"with an empty string, or alternatively, replace the first "*"with an empty string and the second "*"with "b".

Given S, write a program which answers the following queries.

- Given a string T, determine whether T and S **match** and if they do, whether the **match** is **unique**.

Input

The first line of input contains S, a string consisting of lowercase letters of the English alphabet. ($1 \leq |S| \leq 300\,000$)

The second line of input contains Q, denoting the number of queries. ($1 \leq Q \leq 300\,000$)

Each of the following Q lines contains a string T_i. T_i consists of English lowercase letters and "*".

The sum of the lengths of T_i over all queries does not exceed 300 000.

Output

For each T_i, print `0` if it does not **match** S, `1` if the **match** is **unique**, and `2` otherwise.

Example

standard input	standard output
axbbc 3 abc a*c a*b*c	0 1 2