

Eefun Guessing Words

Eefun is currently learning to read. His way of learning is unique, by trying to make every possible substring from a given string. However, when the string becomes longer, he can no longer remember all the substring. His friends want to test Eefun's skill by asking questions, given a string S , is there any substring that begins with letter X and ends with letter Y ? According to Eefun, each substring contains at least 2 letters. As the given string S is pretty big, Eefun need your help to answer his friend's questions

Input

First line of input contain a single string S which was given by his friends.

Second line contain a number N , the number of questions that Eefun's friends ask.

Next N lines each consists of 2 characters, X and Y

Output

For each questions, output a single string "YA" if the substring exists, or "TIDAK" otherwise (YA means yes and TIDAK means no in Indonesian)

Example

Input:

```
HALO
4
H O
L O
A O
O L
```

Output:

```
YA
YA
YA
TIDAK
```

Constraints:

- $'A' \leq X, Y \leq 'Z'$
- $1 \leq |S| \leq 1.000.000$
- $1 \leq N \leq 1.000.000$