

CPSPC

12.6. – 18.6.2006

Sed (Wednesday)

Input File: stdin
Output File: stdout
Source Code: sed.pas/.c/.cpp

100 points
Time limit: 1 s
Memory limit: 64 MB

One of the easiest subject on FMFI is called "Linux for users". It is easy because it is only about learning basic Linux commands and exam consists only of processing some files with them. For example `cat *.cpp | wc -l` counts the number of lines in all your C++ source files and `rm -rf *.cpp` sets it to zero.

The command `sed s/A/aaaAaa/ file1` replaces first occurrence of 'A' in file1 with string "aaaAaa". We can extend it to `sed s/A/aaaAaa/ file1 > tempfile && mv tempfile file1`, which also writes the change to the file1. On the most recent exam, you were given a set of this commands and two files. You were asked, if you can transform first file to the second, using only allowed commands. On exam you can use anything, except using Windows and internet, you can create programs in C++, Pascal or write Bash scripts, which will do work for you.

Task

The commands are of very simple form. The first string is always 'A', and second consists only of letters 'a' and 'A', and always have at least one 'a'. First file contains always 'A' and nothing else. Second file contains one long line of a's. Write program, which will read description of allowed commands and description of second file and determines whether it is possible to transform the first file to the second.

Input

First line of input contains one non-negative integer n ($0 \leq n \leq 10$), denoting number of commands. Next n lines describe allowed commands. There is only one string on each line, consisting of letters 'a' or 'A'. String w ($0 < |w| \leq 10$) means that you can use command `sed s/A/w/ first > tmp && mv tmp first`. The last line of input contains one integer k ($0 \leq k \leq 2,000,000,000$).

Output

Print one line containing **Yes** if and only if it is possible derive string a^k , from 'A' with allowed commands. Otherwise print one line containig **No**. a^k denotes word $\underbrace{aa \dots a}_k$.

Example

Input

2
AAaA
aa
12

Output

Yes