Bad Passwords

Time limit: *3000 ms*
Memory limit: *256 MB*

Xtreme Insecurity, Inc. has a password policy that requires users to change their password every month. Some users have a hard time remembering the password when they change it, so they have taken to using iterated passwords, in which most of the password stays the same, except for a small part that is incremented or decremented. An example would be changing a password from "Secret16!" to "Secret18!" or "PasswordOctober" to "PasswordSeptember".

For this problem, you will be given lists of iterated sequences. You will reject a password change from p_{old} to p_{new} if p_{old} can be expressed as a string $a + s_1 + b$ and p_{new} can be expressed as a string $a + s_2 + b$, where:

- $+$ is the string concatenation operator,
- a is a common prefix of length 0 or longer,
- s_1 and s_2 are strings from the same iterated sequence, and
- b is a common suffix of length 0 or longer.

For example, if "16" and "18" are in the same iterated sequence, we would reject the change from "Secret16!" to "Secret18!" because the two passwords can be expressed as "Secret" + "16" + "!" and "Secret" + "18" + "!". These strings have identical prefixes and suffixes, and "16" and "18" are in the same sequence.

Similarly, if "October" and "September" were in the same iterated sequence, we would reject the change "PasswordOctober" to "PasswordSeptember", since these strings can be expressed as "Password" + "October" + "" and "Password" + "September" + "".

Standard Input

The first line contains an integer n, indicating the number of iterated sequences.

The next n lines each give a sequence of iterated values. The i^{th} line starts with an integer, m_i giving the number of iterated values in the sequence S_i. The remainder of the line contains the list of m space-separated values in the sequence.

The next line presents an integer p, which denotes the number of password changes to examine. The subsequent p lines have two space separated values specifying the old password and the new one, respectively.

Standard Output

For each password change pair, you should output "REJECT" if p_{old} and p_{new} if we should reject the change according to the rules above.

Otherwise, you should output "OK".

Constraints and notes

- $1 \leq n \leq 10$
- $2 \leq m \leq 250$
- $1 \leq p \leq 1000$

All iterated values will be at most 10 characters. They will be ASCII values and include letters, numbers and punctuation.

The passwords will be at most 1000 characters long.

None of the iterated values or passwords will include white-space characters.

The new password will always differ from the old password in at least one character.

Note that the matching of strings should be case-sensitive.

Input	Output	Explanation
6 10 0 1 2 3 4 5 6 7 8 9 12 January February March 7 Monday Tuesday Wednesday 3 qwerty asdf zxcv 2 ana bob 3 ? . ! 20 password1 password2 Pass123 pass124 ShhMonday ShhMarch January23 March23 ABCJanuary MarchABC January23 february23 Tuesday Sunday xyz123 124xyz zxcvz qwertyz asdfasdf asdfzxcv asdfasdf zxvcasdf bobobob anaobob bobobob boboana banana bbobna banana banbob banana baboba password!!! !password!! password!!! password??? password?!! password?!? password!!! password!?!	REJECT OK OK REJECT OK OK REJECT OK REJECT REJECT OK REJECT REJECT REJECT REJECT OK OK OK REJECT REJECT	We reject the change of "password1" to "password2" because we can express these strings as "password" + "1" + "" and "password" + "2" + "". These strings share a common prefix and suffix, and "1" and "2" are present in the first sequence. The change from "Pass123" to "pass124" is OK because the comparisons are case sensitive. The only way to express these strings with a common prefix and suffix is "" + "Pass123" + "" and "" + "pass124" + "". Note that none of the iterated sequences contain these middle strings. The change from "SshMonday to "SshMarch" is OK. We can express these passwords as "Ssh" + "Monday" + "" and "Ssh" + "March" + "". However, "Monday" and "March" are in different iterated sequences. We reject the change of "January23" to "March23" because we can express these strings as "" + "January" + "23" and "" + "March" + "23". Note that "January" and "March" are in the same iterated sequence.