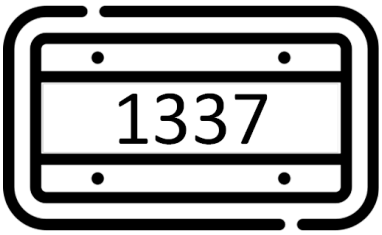
Problem U
Issuing Plates
Time limit: 1 second



You are writing the code to check license plates. These consist of upper letters ‘A’–‘Z’ and numbers ‘0’–‘9’. You want to make sure the codes do not contain any bad words, even considering leetspeak.

Given some input strings, which are valid license plates?

In leetspeak we have the following equivalences: 0=O 1=L 2=Z 3=E 5=S 6=B 7=T 8=B

Input

The first line will contain the integers N and M with $0 \leq N, M \leq 100$. Following this will be N lines containing bad words; each such word will contain only uppercase alphabetic characters (‘A’–‘Z’) and be at most 25 characters long. Then there will be M lines containing the plates to check; each such plate will consist of only uppercase alphabetic characters and numeric digits (‘0’–‘9’) and be at most 25 characters long.

Output

Your output will be M lines, one per plate, in the same order as the plates are given on the input. If the plate is valid, write out the string ‘VALID’; otherwise write out the string ‘INVALID’.

Examples

Sample Input 1	Sample Output 1
7 2 AWFUL BAD CRUMMY LOUSY POOR SAD TERRIBLE SO5OD TROUBADOUR	VALID INVALID