

Everlane Exercise #1

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We've built a new communication protocol that sends messages with a restricted syntax. We need to write a function which determines whether a given message is syntactically valid or not. Here are the rules:

1. There are 15 valid characters in the protocol: the lower-case characters 'a' through 'j' and the upper-case characters 'Z', 'M', 'K', 'P', and 'Q'.
2. Every lower-case character in isolation is a valid message, e.g., 'a' is a valid message.
3. If σ is a valid message then so is $Z\sigma$.
4. If σ and τ are valid messages then so are $M\sigma\tau$, $K\sigma\tau$, $P\sigma\tau$, and $Q\sigma\tau$.
5. All other messages are invalid.

Write a function in the language of your choosing to check whether messages are valid.

The input consists of a series of potential messages separated by whitespace and containing only the 15 characters above.

The output consists of one line per potential messages, followed by 'VALID' if the message is valid and 'INVALID' if it is invalid.

Below is some example output.

Input	Output
Qa Zj	Qa INVALID
MZca	Zj VALID
Khfa	MZca VALID
	Khfa INVALID