Adaptive Morse

A Morse-like code is an assignment of sequences of *dots* and *dashes* to alphabet characters. You are to create a Morse-like code that yields the shortest total length to a given message, and return that total length.

A dot has length 1. A dash has length 3. The gap between dots and dashes within a character has length 1. The gap between characters has length 3. Spaces, punctuation, and alphabetic case are ignored.

For example, the text

`The quick brown dog jumps over the lazy fox.`

is encoded as though it were just

`THEQUICKBROWNDOGJUMPSOVERTHELAZYFOX`

For example, with input `ICPC`, the answer is 17: Encode the `C`'s with a single dot, the `I` with a dash, and the `P` with two dots, for a total of `- . .. .` which has length $3+3+1+3+(1+1+1)+3+1$ or 17.

Input

The input will be a single line consisting of uppercase or lowercase letters, spaces, commas, periods, exclamation points, and question marks.

The line will have a maximum length of 32 000 characters and will contain at least one letter. Everything but the letters should be ignored.

Output

The output will consist of the length of the encoded string when an optimal Morse-like code is used.

Examples

input	output
`ICPC`	`17`
`A`	`1`
`The quick brown dog jumps over the lazy fox.`	`335`