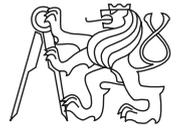




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## CTU Open Contest 2013

### False Sense of Security

`fs.c`, `fs.cpp`, `Fs.java`

Freddy discovered a new procedure to grow much bigger cauliflowers. He wants to share this finding with his fellow gardener Tommy but he does not want anyone to steal the procedure. So the two gardeners agreed upon using a simple encryption technique proposed by M. E. Ohaver.

The encryption is based on the Morse code, which represents characters as variable-length sequences of dots and dashes. The following table shows the Morse code sequences for all letters:

A	.-	H	....	O	---	V	...-
B	-...	I	..	P	.-.	W	.-.
C	-.-.	J	.-.-	Q	--.-	X	-.-.
D	-..	K	-.-	R	.-.	Y	-.--
E	.	L	.-..	S	...	Z	--..
F	..-.	M	--	T	-		
G	--.	N	-.	U	..-		

Note that four possible dot-dash combinations are unassigned. For the purposes of this problem we will assign them as follows (note these are not the assignments for actual Morse code):

underscore (“_”)	..--	period (“.”)	----
comma (“,”)	.-.-	question mark (“?”)	----

In practice, characters in a message are delimited by short pauses, typically displayed as spaces. Thus, the message `ACM.GREATER_NY_REGION` is encoded as:

`.- -.-. - - ..-- --- .-. . .- - .-. .-.- - . -.- .-.- .-.- .-.- .-.- .-.- .-`

The Ohaver’s encryption scheme is based on mutilating Morse code, namely by removing the pauses between letters. Since the pauses are necessary (because Morse is a variable-length encoding that is not prefix-free), a string is added that identifies the number of dots and dashes in each character. For example, consider the message “.--.-.-”. Without knowing where the pauses should be, this could be “ACM”, “ANK”, or several other possibilities. If we add length information, such as “.--.-.- 242”, then the code is unambiguous.

Ohaver’s scheme has three steps, the same for encryption and decryption:

1. Convert the text to Morse code without pauses but with a string of numbers to indicate code lengths.
2. Reverse the string of numbers.
3. Convert the dots and dashes back into the text using the reversed string of numbers as code lengths.

