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/*                      North American */
/*      Invitational Programming Contest */
/* Hosted by the University of Chicago */
/*                      28-30 March, 2014 */
```

J: Two Knight's Poem

Two chess knights have decided to collaborate on writing short, one-line poems. They have obtained the use of a laptop to type their poetry. The laptop keyboard is composed of 4 rows of 10 keys. 30 of these are symbol keys, 4 are Shift keys, and 6 are Space keys.

Q q	W w	E e	R r	T t	Y y	U u	I i	O o	P p
A a	S s	D d	F f	G g	H h	J j	K k	L l	: ;
Z z	X x	C c	V v	B b	N n	M m	< ,	> .	? /
Shift	Shift	Space	Space	Space	Space	Space	Space	Shift	Shift

Note that the **Shift** and **Space** keys, which are usually extra-wide keys on a keyboard, are treated here as multiple individual keys that each have the same effect.

The knights will type the poem by making moves, one at a time, that are valid for a chess knight. A chess knight can move two positions vertically and then one horizontally, or one position vertically and then two horizontally. For example, from the **D** key, a knight can move to any of these keys: **Q**, **Z**, **T**, **B**, the second **Shift** key from the left, and the second **Space** key from the left.

One knight always begins each poem on the left-most Shift key. The other knight always begins on the right-most Shift key. Either knight may move first, and either may make multiple consecutive moves. The knights cannot occupy the same key.

Each move of a knight will type at most one character, adding to the poem. Landing on a symbol key or **Space** key will type one character. A knight landing on a symbol key types the upper value of that key when the other knight is on a **Shift** key; otherwise, the lower value is typed. Landing on a **Space** key always types a single space character, regardless of whether the other knight is on a **Shift** key. Landing on a **Shift** key does not add anything to the poem.

Input

There will be several test cases in the input. Each test case will consist of a string on a single line, representing a poem. Each poem will consist of 1 to 100 characters inclusive, using only characters from the symbol keys on the keyboard and spaces. No poem will begin or end with a space. The input will end with a line with a single asterisk (*).



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Output

For each poem, output **1** if the knights can type the poem, or **0** if they cannot. Output each number on its own line, with no spaces. Do not print any blank lines between outputs.

Sample Input	Sample Output
S,veA,eVE,aU	1
S,veA,eVE,aUc	0
CAlming eventa	1
CAL	1
*	