Encryption

We use the following table to encrypt a text (the character in row c and column i is a space).

	a	b	c	d	e	f	g	h	i
a	i	o	q	h	b	f	y	l	w
b	n	r	a	g	s	k	t	e	z
c	d	u	p	x	c	j	v	m	

The method of encryption: we find each character inside the table, and then substitute them with the letter combination of the row and column heads. We only use letters of the English alphabet.

Write a program that asks for a word as input, and then encrypts that word.

Input

The first line of the *standard input* contains a word. It consists of letters of the English alphabet.

Output

The first line of the *standard output* should contain the encrypted word.

Example

Input	Output
balaton	aebcahbcbgabba

Limits

Time limit: 0.1 second

Memory limit: 32 MB