

Problem 8—Secret Message

Professor Plum’s wife enjoys reading “spy” novels. She likes to send him encoded messages. He hates it, but at least her encryption scheme is fairly simple. She uses a Vigenere cipher which is a form of substitution cipher based on a keyword. She always uses the same keyword for a month. This month’s keyword is “bobwhite” so Professor Plum has the following Vigenere cipher table on his office bulletin board which using the keyword “bobwhite”.

#	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	Position		
1	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	1	9	17
2	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	2	10	18
3	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	3	11	19
4	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	4	12	20
5	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	5	13	21
6	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	6	14	22
7	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	7	15	23
8	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	a	b	c	d	8	16	24

To encrypt a message, the first character of the message uses row 1 (‘a’ maps to a ‘b’, ‘b’ maps to a ‘c’, ..., ‘z’ maps to an ‘a’). The second character of the message uses row 2 (‘a’ maps to a ‘o’, ‘b’ maps to a ‘p’, ..., ‘z’ maps to an ‘n’). If the message is longer than the keyword, then every 8th character uses the same row (e.g., characters of the message at position 1, 9, 17, 25, etc. all use row 1). However, Professor Plum’s wife copies the non-letter characters (spaces, punctuation, digits, etc.) without incrementing the position in the message.

Input Format

The first line of input contains only the keyword used to encrypt the message. The second line of input contains a positive integer n specifying the number of decrypted lines to follow. The remaining n lines of input are the encrypted message to decode.

Output Format

The output should contain the decoded message formatted exactly like the input message. Only the letters have been decrypted with non-letters copied directly from the input to the output. Case of the letters is also preserved.

Input Sample

```
bobwhite
3
Nsfp ig mlf Ioenvv
tx 11:00 QA.
-Twt
```

Output Sample

Meet by the Union
at 11:00 PM.
-Sam