

## Homework #2 Hints

**Vigenere-cipher encryption example:** For the keyword “bobwhite” and the subset of 32 characters shown in the top row below (i.e., letters, ' /space, '\n'/new-line, , /comma, ./period, ?/question-mark, and !/exclamation-point), the Vigenere-cipher table would be:

Letter #	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	'	'\n'	,	.	?	!	Additional Positions		
0	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	'	'\n'	,	.	?	!	a	8	16	24
1	o	p	q	r	s	t	u	v	w	x	y	z	'	'\n'	,	.	?	!	a	b	c	d	e	f	g	h	i	j	k	l	m	n	9	17	25
2	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	'	'\n'	,	.	?	!	a	10	18	26
3	w	x	y	z	'	'\n'	,	.	?	!	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	11	19	27
4	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	'	'\n'	,	.	?	!	a	b	c	d	e	f	g	12	20	28
5	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	'	'\n'	,	.	?	!	a	b	c	d	e	f	g	h	13	21	29
6	t	u	v	w	x	y	z	'	'\n'	,	.	?	!	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	14	22	30
7	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	'	'\n'	,	.	?	!	a	b	c	d	15	23	31

To encrypt a message with the keyword “bobwhite”, the first character of message (at position 0) uses row 0 (‘a’ maps to a ‘b’, ‘b’ maps to a ‘c’, etc.). The second character of the message (at position 1) uses row 1 (‘a’ maps to a ‘o’, ‘b’ maps to a ‘p’, etc.). If the message is longer than the keyword, then every 8<sup>th</sup> character (i.e., the length of “bobwhite”) uses the same row (e.g., characters of the message at positions 1, 9, 17, 25, 33, etc. all use row 1). All upper-case letters can be converted to lower-case before encryption. Any characters not in the top row can be completely ignored (i.e., discarded) without incrementing the position in the message.

The text-file message.txt (with new-line characters shown as '\n') would be encrypted to message.zzz and then decrypted back to decryptedMessage.txt as shown below:

message.txt

```
Meet by the Union\n
at noon today!\n
-Sam\n
```

message.zzz

```
nsfjbjl?uvfq\n
v\n
sojbbjbvbsiuekild,abcc
```

decryptedMessage.txt

```
meet by the union\n
at noon today!\n
sam\n
```

### Hints:

- You don’t actually need to create the Vigenere-cipher table shown above. Instead just use the position of each character from the overall sequence, and the position of each keyword character in the overall sequence

Seq. #	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Letter	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	'	'\n'	,	.	?	!

Position	0	1	2	3	4	5	6	7
Letter	b	o	b	w	h	i	t	e

Letter seq. #	1	14	1	22	7	8	19	4
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- Encryption of first part of the message ('Meet '):

