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Batch: T11

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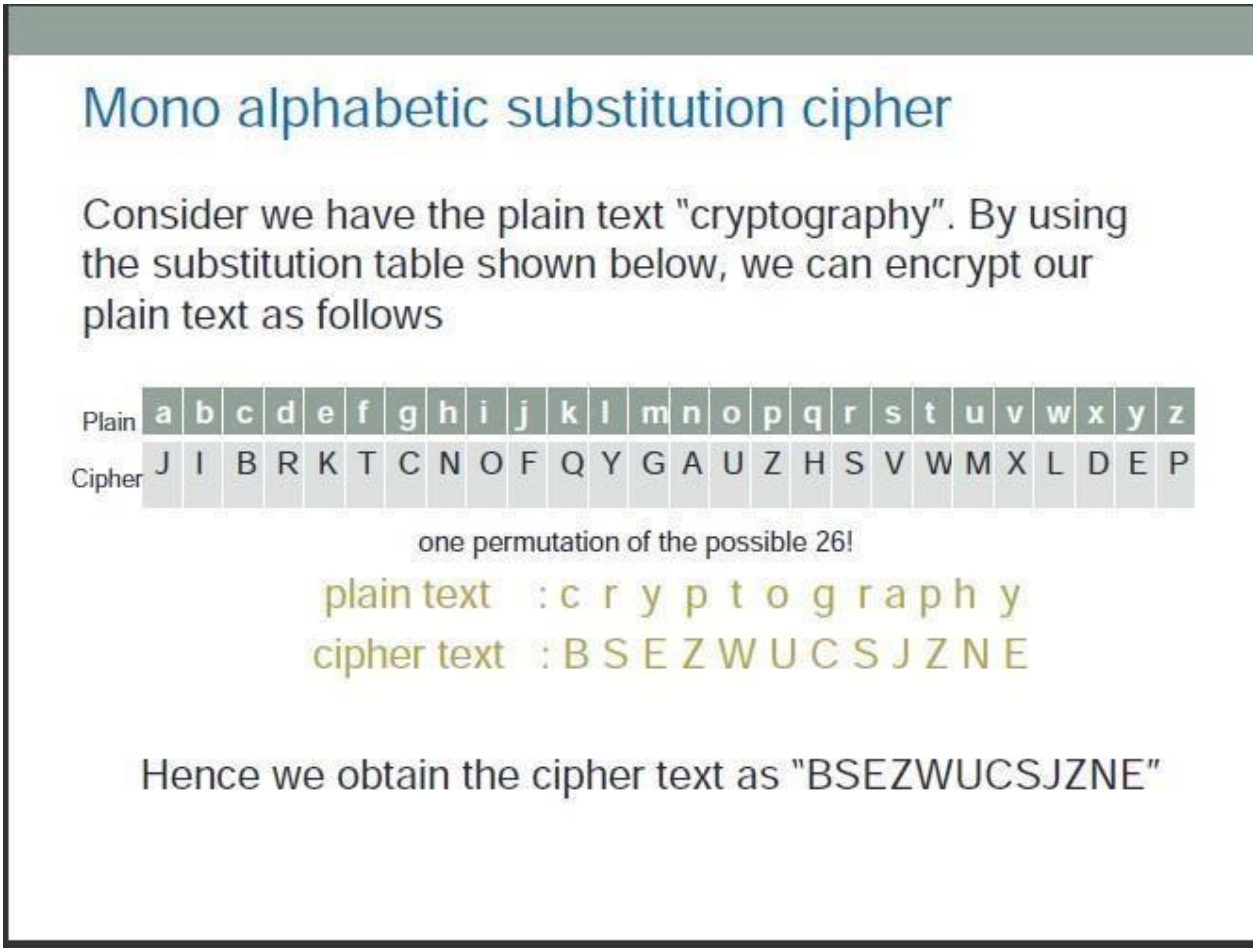
Assignment No. 1

Aim: Shift cipher and mono alphabet substitution cipher.

Theory:

Monoalphabetic Cipher is a part of the substitution technique in which a single cipher alphabet is used per message (mapping is done from plain alphabet to cipher alphabet). Monoalphabetic cipher converts plain text into cipher text and re-convert a cipher text to plain text. Monoalphabetic Cipher eliminates the brute-force techniques for cryptanalysis. Moreover, the cipher line can be a permutation of the 26 alphabetic characters.



Mono alphabetic substitution cipher

Consider we have the plain text "cryptography". By using the substitution table shown below, we can encrypt our plain text as follows

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

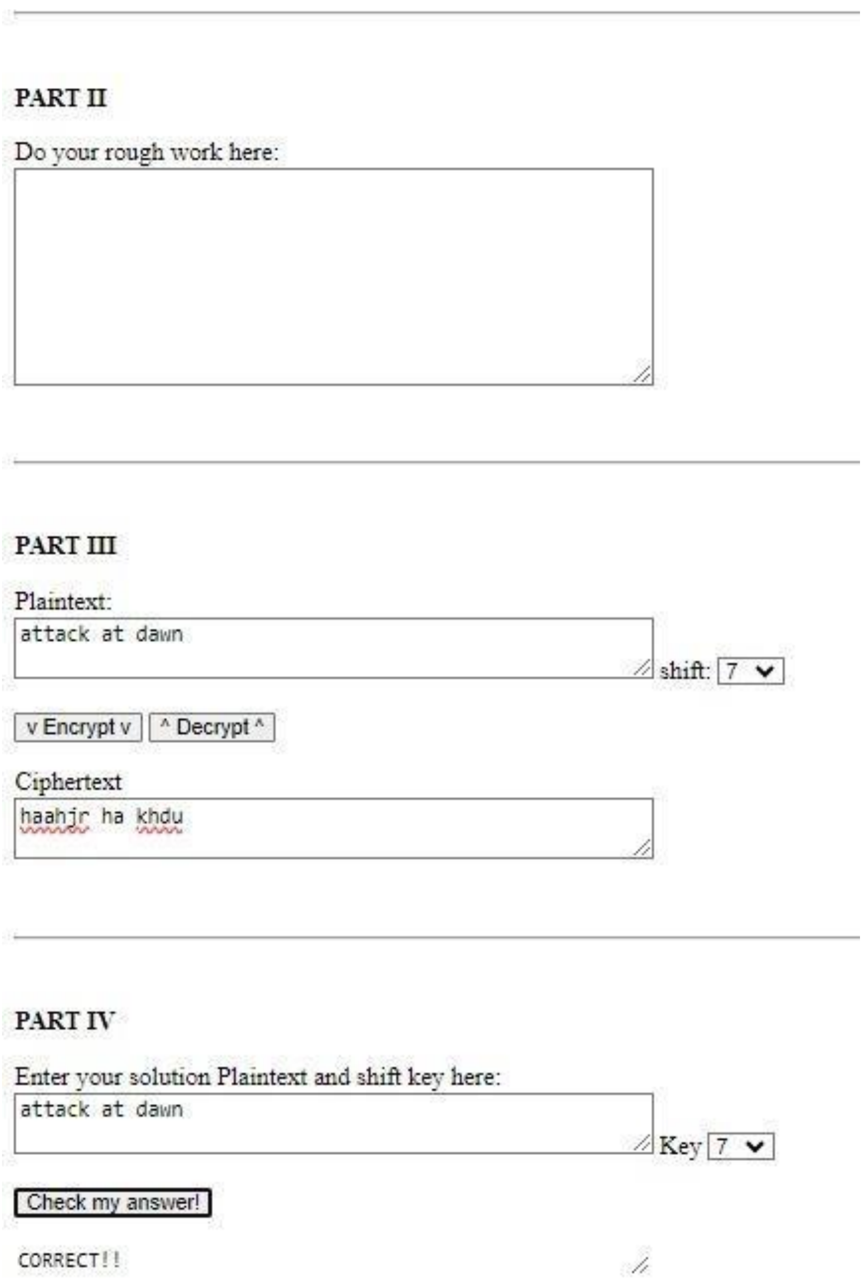
one permutation of the possible 26!

plain text : c r y p t o g r a p h y

cipher text : B S E Z W U C S J Z N E

Hence we obtain the cipher text as "BSEZWUCSJZNE"

Implementation:



PART II

Do your rough work here:

PART III

Plaintext: attack at dawn

shift: 7

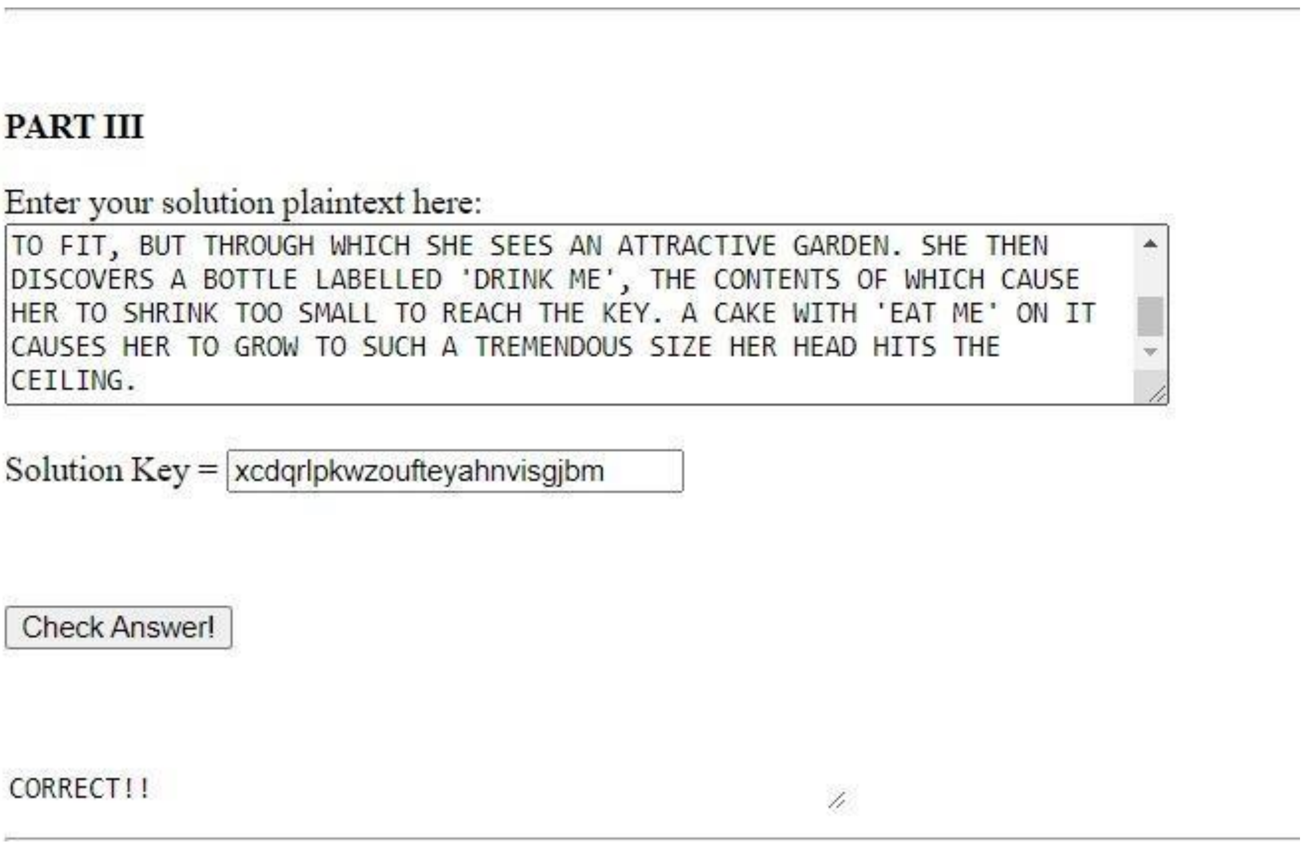
Ciphertext: haahjr ha khdu

PART IV

Enter your solution Plaintext and shift key here: attack at dawn

Key 7

CORRECT!!



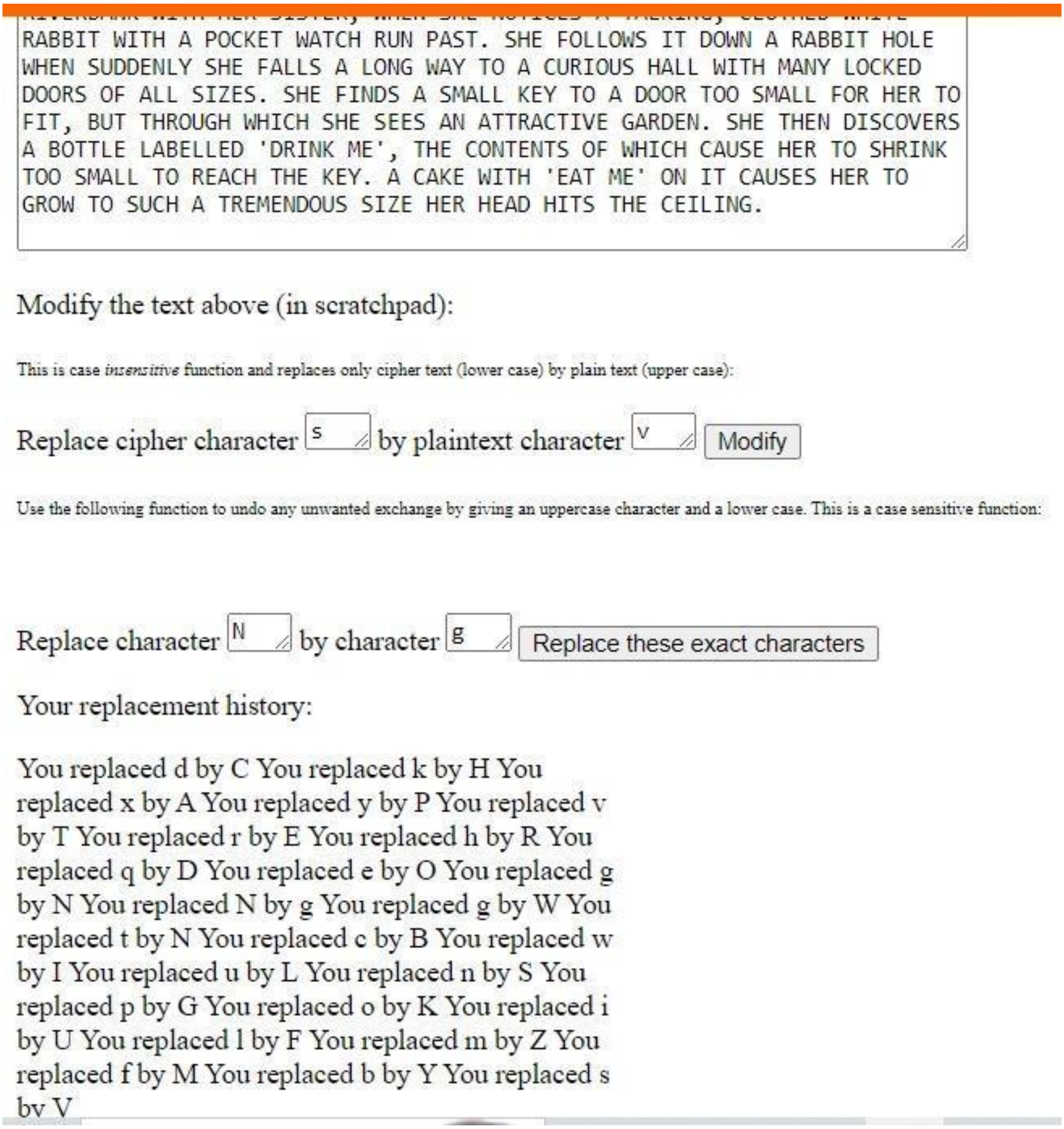
PART III

Enter your solution plaintext here:

```
TO FIT, BUT THROUGH WHICH SHE SEES AN ATTRACTIVE GARDEN. SHE THEN
DISCOVERS A BOTTLE LABELLED 'DRINK ME', THE CONTENTS OF WHICH CAUSE
HER TO SHRINK TOO SMALL TO REACH THE KEY. A CAKE WITH 'EAT ME' ON IT
CAUSES HER TO GROW TO SUCH A TREMENDOUS SIZE HER HEAD HITS THE
CEILING.
```

Solution Key = xcdqrlpkwzoufteyahnvisgjbm

```
CORRECT!!
```



```
RABBIT WITH A POCKET WATCH RUN PAST. SHE FOLLOWS IT DOWN A RABBIT HOLE
WHEN SUDDENLY SHE FALLS A LONG WAY TO A CURIOUS HALL WITH MANY LOCKED
DOORS OF ALL SIZES. SHE FINDS A SMALL KEY TO A DOOR TOO SMALL FOR HER TO
FIT, BUT THROUGH WHICH SHE SEES AN ATTRACTIVE GARDEN. SHE THEN DISCOVERS
A BOTTLE LABELLED 'DRINK ME', THE CONTENTS OF WHICH CAUSE HER TO SHRINK
TOO SMALL TO REACH THE KEY. A CAKE WITH 'EAT ME' ON IT CAUSES HER TO
GROW TO SUCH A TREMENDOUS SIZE HER HEAD HITS THE CEILING.
```

Modify the text above (in scratchpad):

This is case *insensitive* function and replaces only cipher text (lower case) by plain text (upper case):

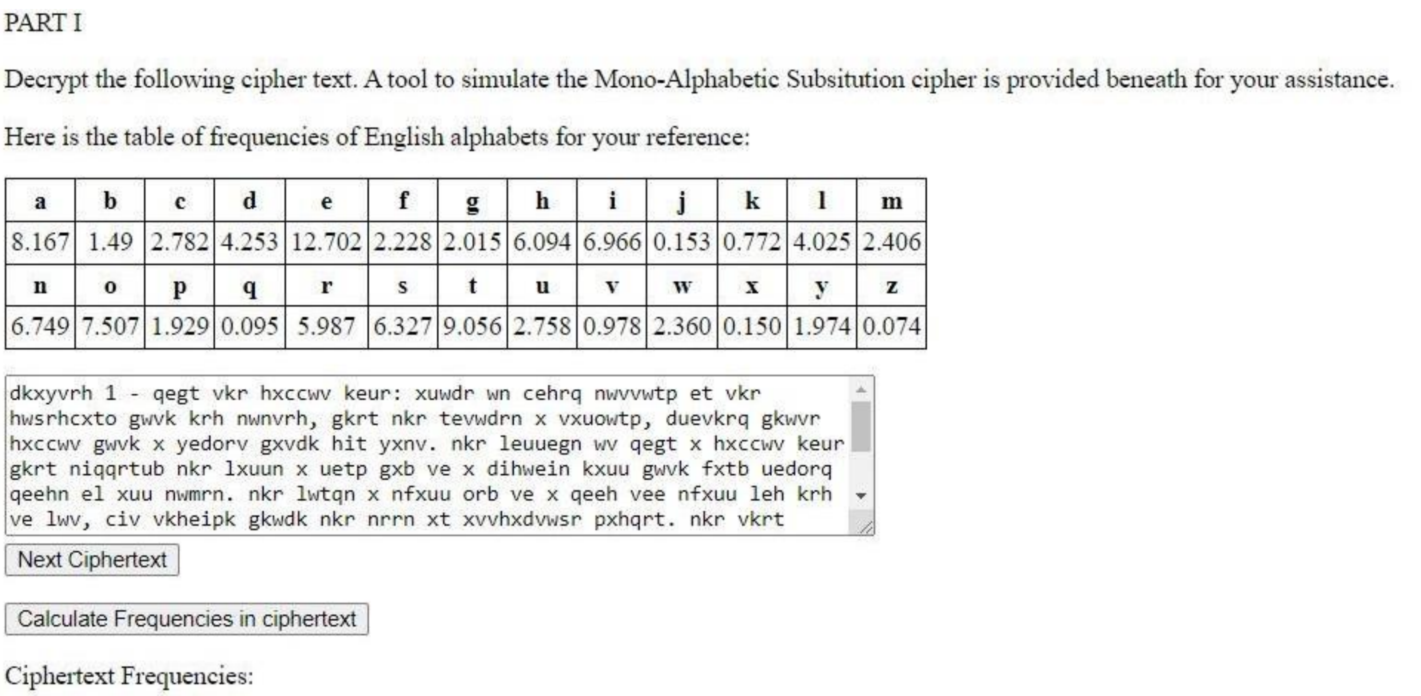
Replace cipher character s by plaintext character v Modify

Use the following function to undo any unwanted exchange by giving an uppercase character and a lower case. This is a case sensitive function:

Replace character N by character g Replace these exact characters

Your replacement history:

You replaced d by C You replaced k by H You replaced x by A You replaced y by P You replaced v by T You replaced r by E You replaced h by R You replaced q by D You replaced e by O You replaced g by N You replaced N by g You replaced g by W You replaced t by N You replaced c by B You replaced w by I You replaced u by L You replaced n by S You replaced p by G You replaced o by K You replaced i by U You replaced l by F You replaced m by Z You replaced f by M You replaced b by Y You replaced s by V



PART I

Decrypt the following cipher text. A tool to simulate the Mono-Alphabetic Subsitution cipher is provided beneath for your assistance.

Here is the table of frequencies of English alphabets for your reference:

a	b	c	d	e	f	g	h	i	j	k	l	m
8.167	1.49	2.782	4.253	12.702	2.228	2.015	6.094	6.966	0.153	0.772	4.025	2.406
n	**o**	**p**	**q**	**r**	**s**	**t**	**u**	**v**	**w**	**x**	**y**	**z**
6.749	7.507	1.929	0.095	5.987	6.327	9.056	2.758	0.978	2.360	0.150	1.974	0.074

```
dkxyvrh 1 - qegt vkr hxccwv keur: xuwdr wn cehrq nwvvwtp et vkr
hwsrhcxto gwvk krh nwnvrh, gkrt nkr tevwdrn x vxuowtp, duevkrq gkwvr
hxccwv gwvk x yedorv gxvdk hit yxnv. nkr leuuegn wv qegt x hxccwv keur
gkrt niqqrtub nkr lxuun x uetp gxb ve x dihwein kxuu gwvk fxtb uedorq
qeehn el xuu nwmrn. nkr lwtqn x nfxuu orb ve x qeeh vee nfxuu leh krh
ve lwv, civ vkheipk gkwdk nkr nrrn xt xvvhxdvwsr pxhqrt. nkr vkrt
```

Ciphertext Frequencies: