

# Cadenus Cipher

## What is the Cadenus Cipher?

The Cadenus cipher takes a plaintext whose length is a multiple of 25. A keyword of length N is chosen such that  $N = \text{plaintextlength} / 25$ . In other words, a plaintext of length 100 will require a keyword of length 4 ( $100/25 = 4$ ). The columns are rearranged such that the letters of the keyword corresponding to each column are put into alphabetical order. A 25-letter key is placed alongside the plaintext columns, and the keyword letter for each column is found in the key column. The plaintext letter in that row becomes the letter at the top of the ciphertext column. The ciphertext is then taken from the resulting columns in order horizontally.

## Example

**Plaintext:** Whoever has made a voyage up the Hudson must remember the Kaatskill mountains. They are a dismembered branch of the great

**Key:** WINK

**Encipher step:**

W	I	N	K			I	K	N	W
4	1	3	2			1	2	3	4
w	h	o	e	A		A	N	T	O
v	e	r	h	Z		D	N	L	E
a	s	m	a	Y		E	E	U	H
d	e	a	v	X		R	E	I	D
o	y	a	g	V/W		R	S	H	M
e	u	p	t	U		H	B	R	R
h	e	h	u	T		H	D	I	M
d	s	o	n	S		E	N	M	T
m	u	s	t	R		H	F	E	A
r	e	m	e	Q		E	G	A	K
m	b	e	r	P		S	T	O	M
t	h	e	k	O		E	E	E	T
a	a	t	s	N		Y	H	A	S
k	i	l	l	M		U	A	O	Y
m	o	u	n	L		E	V	R	A
t	a	i	n	K		S	G	M	M
s	t	h	e	J		U	T	A	E
y	a	r	e	I		E	U	A	B
a	d	i	s	H		B	N	P	C
m	e	m	b	G		H	T	H	T
e	r	e	d	F		A	E	O	R
b	r	a	n	E		I	R	S	W
c	h	o	f	D		O	K	M	V
t	h	e	g	C		A	S	E	A
r	e	a	t	B		T	L	E	D

**Ciphertext:** ANTOD NLEEE UHREI DRSHM HBRRH DIMEN MTHFE AEGAK STOME EETYP ASUAO YEVRA SGMMU  
TAEU ABBNP CHTHT AEORI RSWOK MVASE ATLED

## Vulnerabilities of the Cadenus Cipher

As with any transposition cipher, the frequency count and monographic IC will look like that of plain English, unless the plaintext is chosen carefully.

## How to Crack the Cadenus Cipher

If the ciphertext length is a multiple of 25, it should be written into lines of height five, with the last column at the top. The top line has been shifted from its actual starting point less than the lines below it, with the possible exception of the first line. Using this knowledge, attempt to adjust the positions of the lines, moving left and right, until common English words like THE and AND can be spelled with the letters in some of the columns. Finally, rearrange the lines to form actual words from top to bottom, using trial and error until the message is revealed.