

# Intro to encryption

# Outline

## Outline

# **1. What is encryption?**

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1. What is encryption?
2. **Types of encryption**

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1. What is encryption?
2. Types of encryption
3. **Encryption keys**

## Outline

1. What is encryption?
2. Types of encryption
3. Encryption keys
4. **Practical examples**

**What is encryption?**

# Plain text

**What is encryption?**

Types of encryption

Encryption keys

Practical examples



Plain text → Cipher text

**What is encryption?**

Types of encryption

Encryption keys

Practical examples

# Encryption



Plain text



Cipher text

**What is encryption?**

Types of encryption

Encryption keys

Practical examples

Plain text

‘Hello BeCode! This  
text has not been  
encrypted yet.’

**What is encryption?**

Types of encryption

Encryption keys

Practical examples

Plain text

‘Hello BeCode! This  
text has not been  
encrypted yet.’



Cipher text

wvzrf bqowqk! bzag  
vsle wrg tft nqma  
kvujmrhso nvh.

**What is encryption?**

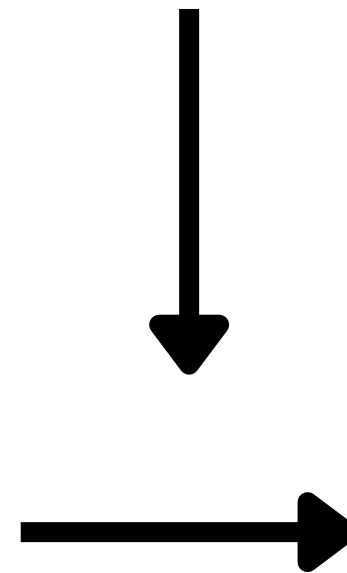
Types of encryption

Encryption keys

Practical examples

# Encryption

Plain text  
'Hello BeCode! This  
text has not been  
encrypted yet.'



Cipher text  
wvzrf bqowqk! bzag  
vsle wrg tft nqma  
kvujmrhso nvh.

What is encryption?

Types of encryption

Encryption keys

Practical examples

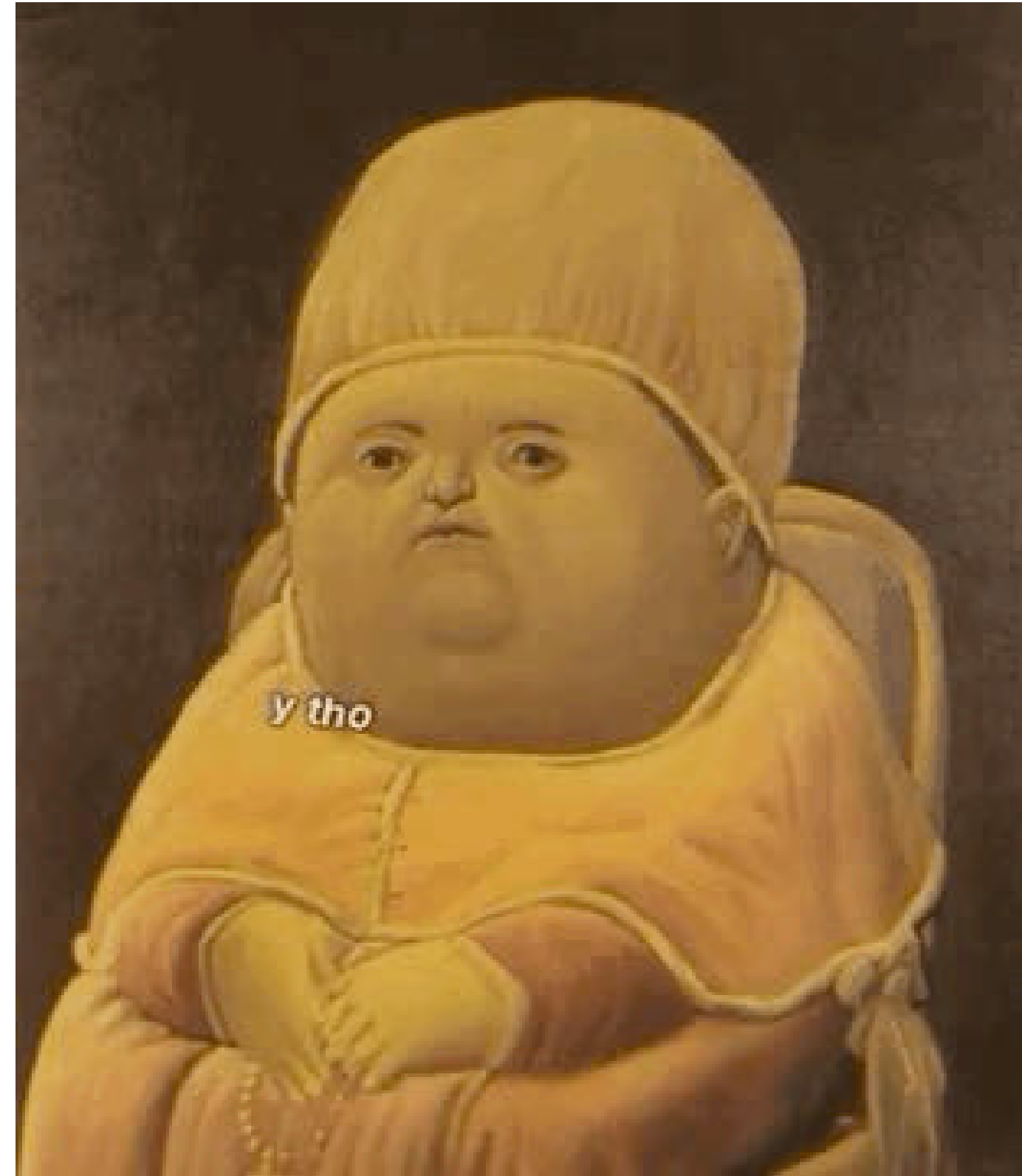
**A reversible way of modifying data to make it (un)usable to (un)authorized entities**

**What is encryption?**

Types of encryption

Encryption keys

Practical examples



**What is encryption?**

Types of encryption

Encryption keys

Practical examples

y tho

- **Confidentiality**

**What is encryption?**

Types of encryption

Encryption keys

Practical examples



y tho

- Confidentiality
- **Authentication**

What is encryption?

Types of encryption

Encryption keys

Practical examples

y tho

- Confidentiality
- Authentication
- **Integrity**

What is encryption?

Types of encryption

Encryption keys

Practical examples

# **Types of encryption**

# Types of encryption

What is encryption?

**Types of encryption**

Encryption keys

Practical examples

Types of encryption

# Symmetrical & Asymmetrical

What is encryption?

**Types of encryption**

Encryption keys

Practical examples

# Symmetrical encryption

- **2 ways**

What is encryption?

**Types of encryption**

Encryption keys

Practical examples

# Symmetrical encryption

- 2 ways
- **1 key**

What is encryption?

**Types of encryption**

Encryption keys

Practical examples

# Symmetrical encryption

- 2 ways
- 1 key

- **Faster but less secure**



What is encryption?

**Types of encryption**

Encryption keys

Practical examples



# Asymmetrical encryption

- **1 way**

What is encryption?

**Types of encryption**

Encryption keys

Practical examples

# Asymmetrical encryption

- 1 way
- **2 keys**

What is encryption?

**Types of encryption**

Encryption keys

Practical examples

# Asymmetrical encryption

- 1 way
- 2 keys
- **Slower**



What is encryption?

**Types of encryption**

Encryption keys

Practical examples

# Asymmetrical encryption

- 1 way
- 2 keys
- **Slower but more secure**



What is encryption?

**Types of encryption**

Encryption keys

Practical examples

- **Best of both worlds**

# Hybrid encryption

- Best of both worlds
- **Asymmetric on symmetric key**

What is encryption?

**Types of encryption**

Encryption keys

Practical examples

# Hybrid encryption

- Best of both worlds
- Asymmetric on symmetric key
- **Symmetric for big data**

What is encryption?

**Types of encryption**

Encryption keys

Practical examples

# Encryption keys



Encryption key

A string of **characters** used  
to **encrypt/decrypt** data

What is encryption?

Types of encryption

**Encryption keys**

Practical examples

# Where should you store an encryption key

What is encryption?

Types of encryption

**Encryption keys**

Practical examples

Wake up!



**Wrong answers only**

Event code: **FPIUYC**

**[wooclap.com/events/FPIUYC](https://wooclap.com/events/FPIUYC)**

What is encryption?

Types of encryption

**Encryption keys**

Practical examples

On a **seperate** location  
**from the encrypted data**

What is encryption?

Types of encryption

**Encryption keys**

Practical examples

# Why/when to change encryption key

What is encryption?

Types of encryption

**Encryption keys**

Practical examples

Why/when to change encryption key

- **Compromised key / new threat**

What is encryption?

Types of encryption

**Encryption keys**

Practical examples

## Why/when to change encryption key

- Compromised key / new threat
- **Cryptoperiod**

What is encryption?

Types of encryption

**Encryption keys**

Practical examples

## Why/when to change encryption key

- Compromised key / new threat
- Cryptoperiod
- **Amount of data encrypted**

What is encryption?

Types of encryption

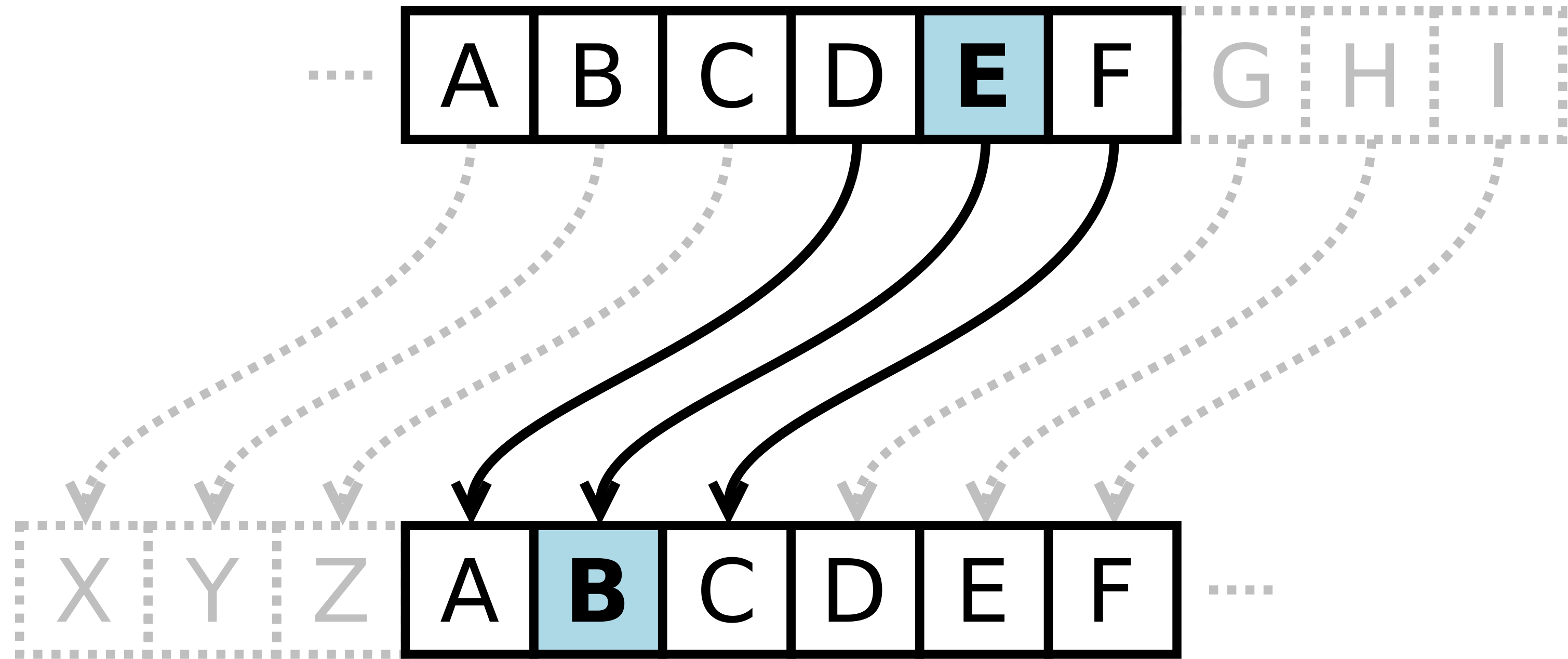
**Encryption keys**

Practical examples



# **Practical examples**

# Caesar cipher



What is encryption?

Types of encryption

Encryption keys

**Practical examples**



# Vigenère cipher

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

cipher	VVVRBACP
key	COVERCOVER...
plaintext	THANKYOU

In encrypting plaintext, the cipher letter is found at the intersection of the column headed by the plaintext letter and the row indexed by the key letter. To decrypt ciphertext, the plaintext letter is found at the head of the column determined by the intersection of the diagonal containing the cipher letter and the row containing the key letter.

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What is encryption?

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Practical examples



A man in a dark suit, white shirt, and patterned tie stands in an office. He is positioned in front of a glass door with horizontal blinds. A sign on the door reads "MEETING IN PROGRESS". To the left, there is a window with horizontal blinds and a black office chair. The scene is lit with indoor office lighting.

**Thank you for your attention!**

# Ressources

## **Cryptographic Storage Cheat Sheet:**

[https://cheatsheetseries.owasp.org/cheatsheets/Cryptographic Storage Cheat Sheet.html](https://cheatsheetseries.owasp.org/cheatsheets/Cryptographic_Storage_Cheat_Sheet.html)

## **Encryption - Symmetric Encryption vs Asymmetric Encryption - Cryptography - Practical TLS:**

[https://youtu.be/o\\_g-M7UBqI8](https://youtu.be/o_g-M7UBqI8)

## **Public and Private Keys - Signatures & Key Exchanges - Cryptography - Practical TLS:**

[https://youtu.be/\\_zyKvPvh808](https://youtu.be/_zyKvPvh808)

## **Encryption key generator:**

<https://generate-random.org/encryption-key-generator>

**Questions?**