


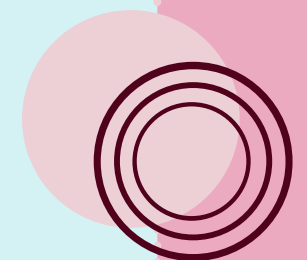
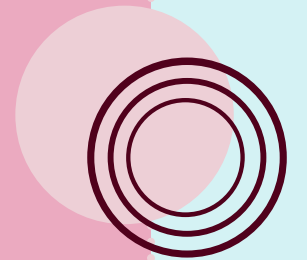
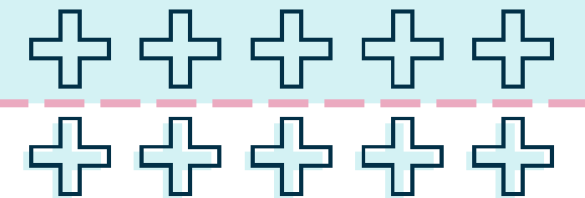
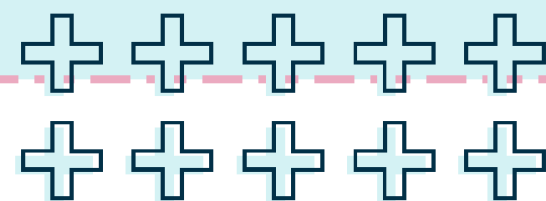


# CRYPTOGRAPHY PROJECT

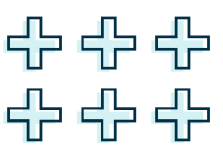
*Text to Image Encryption*

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*Image to Text Encryption*



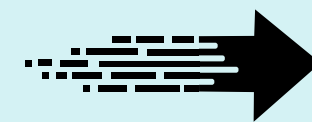
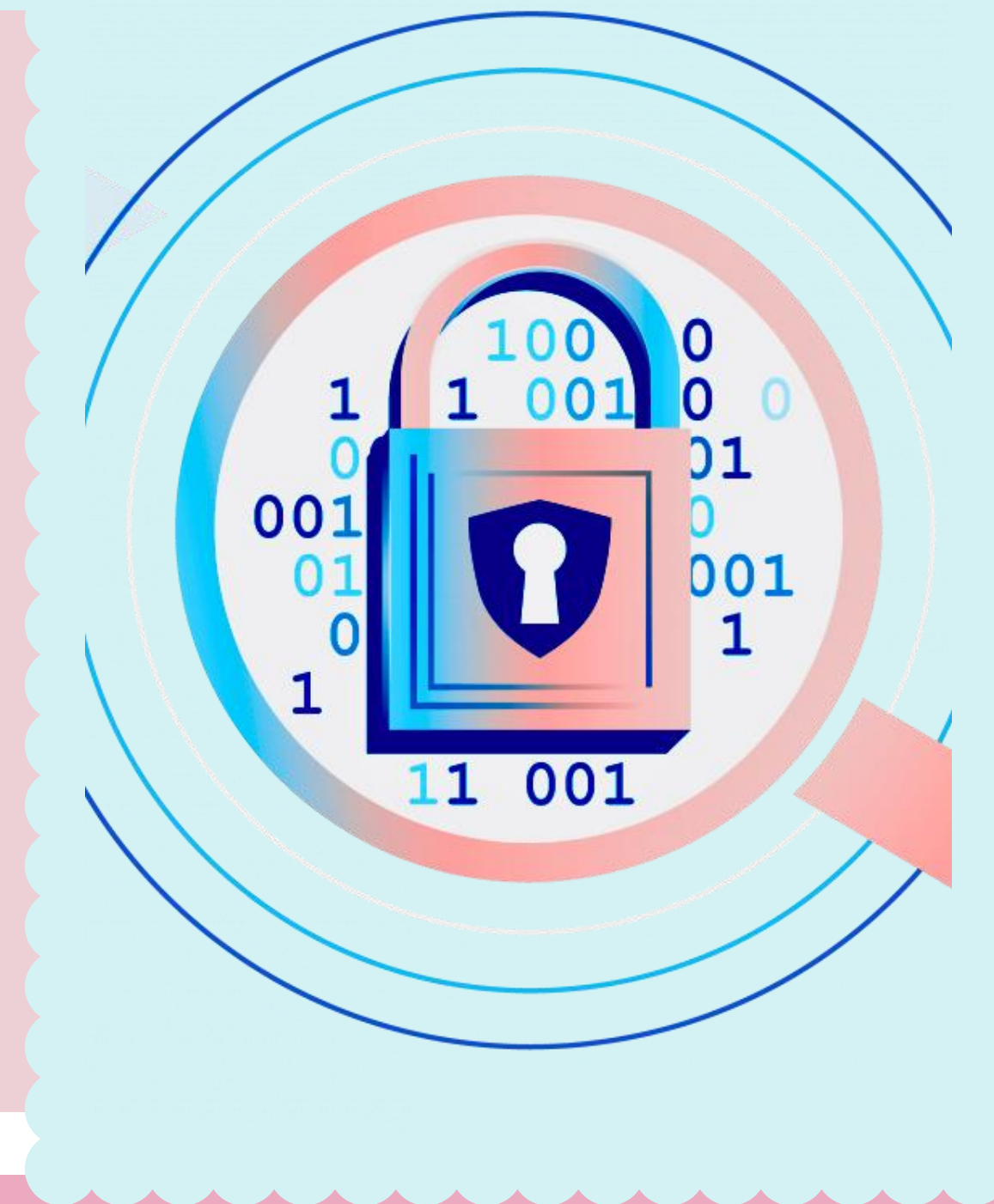
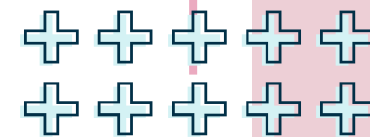
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# Introduction

The project is developed to address the need for securely storing images and personal data. This Python application, implemented with Qt, offers two essential functionalities aimed at ensuring the confidentiality of your information.

- **Image to Text Encryption/Decryption:** Employing the Fernet symmetric encryption algorithm, our application allows users to encrypt and decrypt images seamlessly. This functionality ensures that your visual data remains protected and inaccessible to unauthorized individuals.
- **Text to Image Encryption/Decryption:** Leveraging steganography techniques, our application enables users to embed text data within images, enhancing the security of personal information. By embedding text into seemingly ordinary images, users can safeguard their sensitive data effectively.

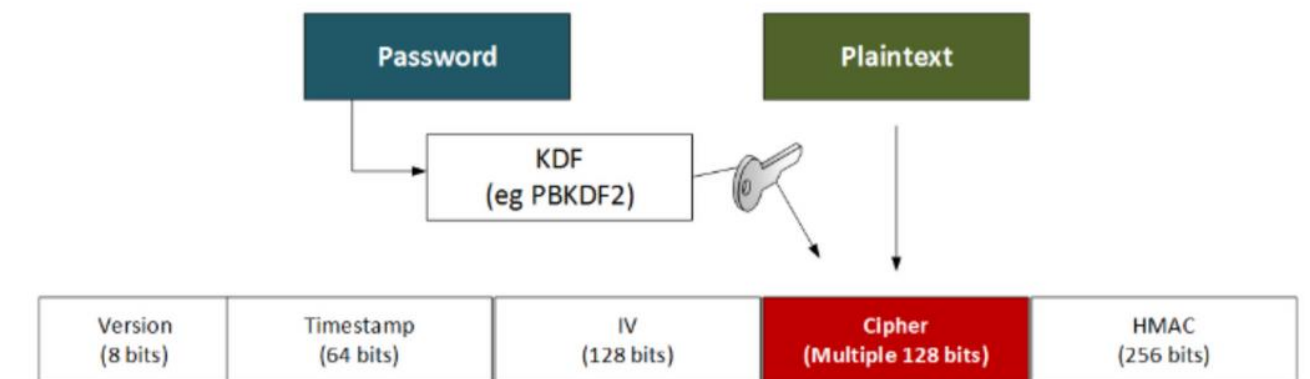


# Image to Text Encryption/Decryption

In our Application, the encryption process for images is accomplished using the Fernet algorithm, a symmetric encryption technique. This robust algorithm is accessed through the Python cryptography module, ensuring a high level of security for your sensitive data.

Fernet is an implementation of symmetric authenticated cryptography, also known as "secret key" cryptography. This means that the same key is used for both encryption and decryption, simplifying the process while maintaining security.

## Fernet (symmetric encryption)



Fernet provides strong guarantees regarding the integrity and confidentiality of encrypted messages. It ensures that any message encrypted using it cannot be tampered with or deciphered without the appropriate key. This makes Fernet an ideal choice for safeguarding your images and personal information.

Moreover, Fernet offers support for key rotation through MultiFernet, enabling the seamless transition to new encryption keys without compromising the security of existing data. This feature enhances the long-term viability and robustness of our encryption solution.

## Why Fernet?

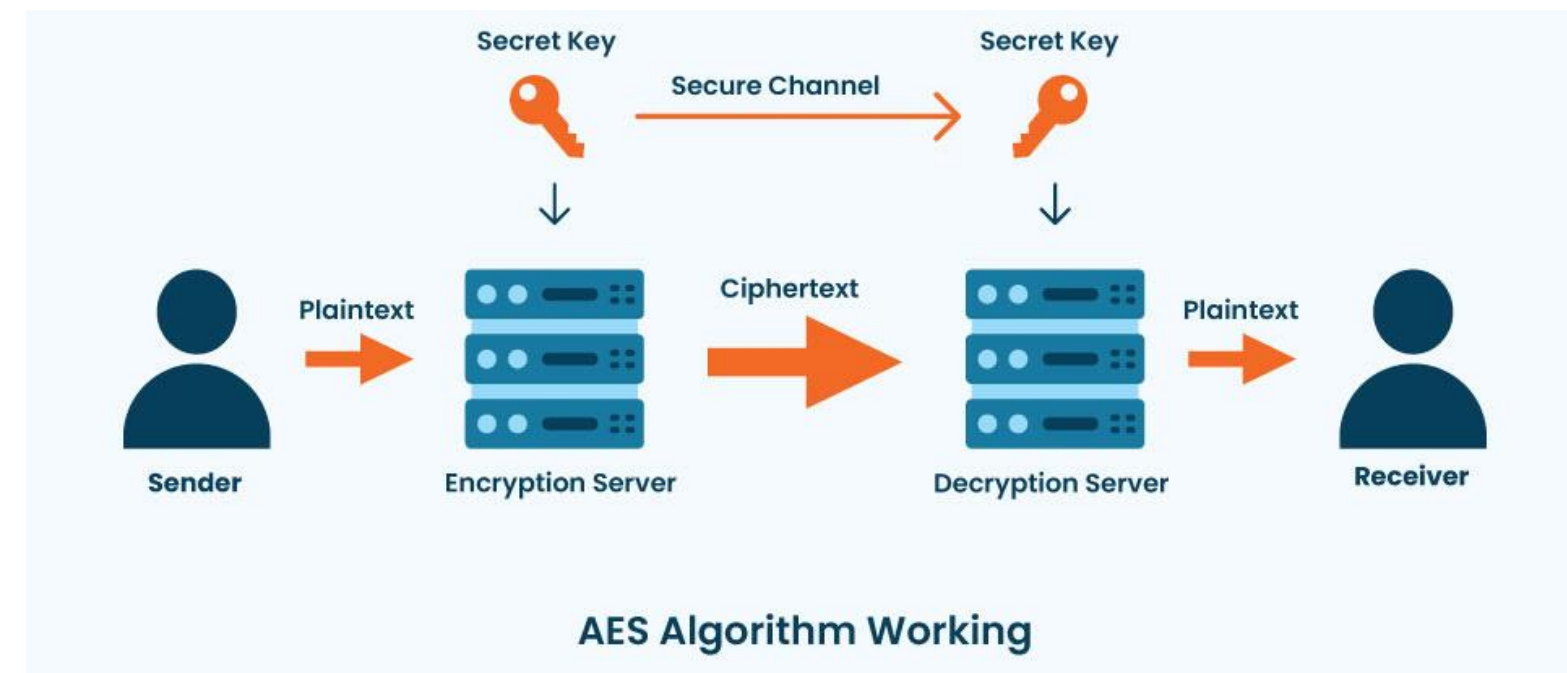


# Text to Image Encryption/Decryption

Our Application offers a robust solution for encrypting text data and embedding it within images using steganography techniques. This functionality is achieved through the integration of the Python file cryptosteganography.

Steganography is the art of hiding information within various types of media, such as images or audio files, in a way that conceals the existence of the message from anyone other than the intended recipient. This technique provides an additional layer of security through obscurity, making it challenging for unauthorized parties to detect the hidden information.

To further enhance the security of our steganography implementation, the data concealed within the images is encrypted using the AES-256 encryption algorithm.



AES-256, also known as Advanced Encryption Standard with a 256-bit key size, offers a high level of security by providing a large key space, making brute-force attacks impractical. Its popularity and adoption in various industries attest to its effectiveness in protecting data confidentiality.

By leveraging AES-256 encryption within our steganography module, we ensure that your text data remains securely encrypted within the image, providing peace of mind regarding the confidentiality of your information.

## Why AES-256?



Thank You

