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## **INFORMATION HIDING IN IMAGES**

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# DOMAIN OF THE PROJECT

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DOMAIN : CYBER SECURITY

TOPIC : IMAGE CRYPTOGRAPHY

Cryptography is the study of mathematical techniques related to aspects of information security such as confidentiality, data integrity, entity authentication, and data origin authentication. Cryptography protects information by transforming it into an unreadable format.

# Image cryptography

- The image encryption is to transmit the image securely over the network so that no unauthorized user can be able to decrypt the image.
- Encryption will be defined as the conversion of plain message into a form called a cipher text that cannot be read by any people without decrypting the encrypted text.
- Decryption is the reverse process of encryption which is the process of converting the encrypted text into its original plain text , so that it can be read .
- Encryption is the process of applying special mathematical algorithms and keys to transform digital data into cipher code before they are transmitted

# ABSTRACT

- Nowadays, information security more important in data storage and transmission images are used in different-different processes. therefore, security the security of image data from unauthorized uses in important.
- Image encryption plays an important role in the field of information hiding.
- image encryption method prepare information unreadable. Therefore, no hacker and service administrators and others ,have access to original message or any type of transmitted information through public networks such as internet.

# LITERATURE SURVEY

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1. A novel image encryption based on row-column, masking and main diffusion processes with hyper chaos. (2015) In this paper, a novel algorithm for image encryption based on the hyper-chaotic system is proposed. The algorithm consists of three main sections. In the first Section the rows and columns of the image are encrypted using a row-column algorithm. In the Second section employs masking process which is applied to each quarter of the image that is to be encrypted, using that sub-image data itself and one of the other sub-images and the average data of other quarters of image. Finally, in the last diffusion section, the four most significant bit planes will be encrypted.

2. An image encryption scheme based on a new hyperchaotic finance system. (2015) In this paper, a new four-dimensional hyperchaotic finance system based on a chaotic finance system is presented. The chaotic sequence is generated by using Runge–Kutta method, the key sequence is generated by chaotic sequence comparison. The key sequence is used for image encryption with relation to plaintext.
3. Efficient image encryption with block shuffling and chaotic map. (2015) In the first step, they scramble image blocks to achieve initial encryption. In the second step, generate a set of secret matrices by a chaotic map and Arnold transform. They adopt the skew tent chaotic map for randomized secret matrix generation.



# EXISTING SYSTEM

- There is no option to try all the algorithms together in one system.
- There is no privilege for the user to send the encrypted message to other person as a mail.
- There is no database storage for the existing system. Further retrieval of the code is not possible.
- The system do not check for any authentication. Any user can encrypt and decrypt.
- It is easy for an intruder(third party )to access the text and he can make his own changes in it.

# DISADVANTAGES

- Pixels obtained after Gaussian elimination is fully distorted, so the key is needed to obtain original image because it's hard to crack that encrypted form.
- Both encryption and decryption have been processed by clicking the encryption button. there will be no availability of the decryption button.
- Efficiency of our algorithm is  $\frac{2}{3} * O(n^3)$ . Decryption takes 4 times larger the time taken by Encryption.



# PROPOSED SYSTEM

- It hides the message and your privacy is safe.
- You can write whatever you want and however you want (any theme any symbol for the code) to keep your code a secret by using encrypt .
- The system CRYPTO corner contains a data base and the data can be stored and retrieved easily and also system provides email facility.
- The person who got the mail has to login to the CRYPTO corner and decrypt it.
- The system checks for security. If the user type incorrect password for three time. Then the system will automatically block the user and the user gets a message as unauthorized access.

# ADVANTAGES

- Simplicity: It's simpler, cheaper. Ratio: Encryption takes  $\frac{1}{4}$  th time the decryption process takes.
- Robust: The encrypted image is hard to hack to obtain the original image.
- Pixels obtained after Gaussian elimination is fully distorted, so the key is needed to obtain original image because it's hard to crack that encrypted form.
- We have reduced time taken by encryption by smartly by updating row exchanges using another matrix. So basically it's a Space for time tradeoff.

# SYSTEM SPECIFICATION

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## SOFTWARE REQUIREMENTS

This section gives the details of the software that are used for the development.

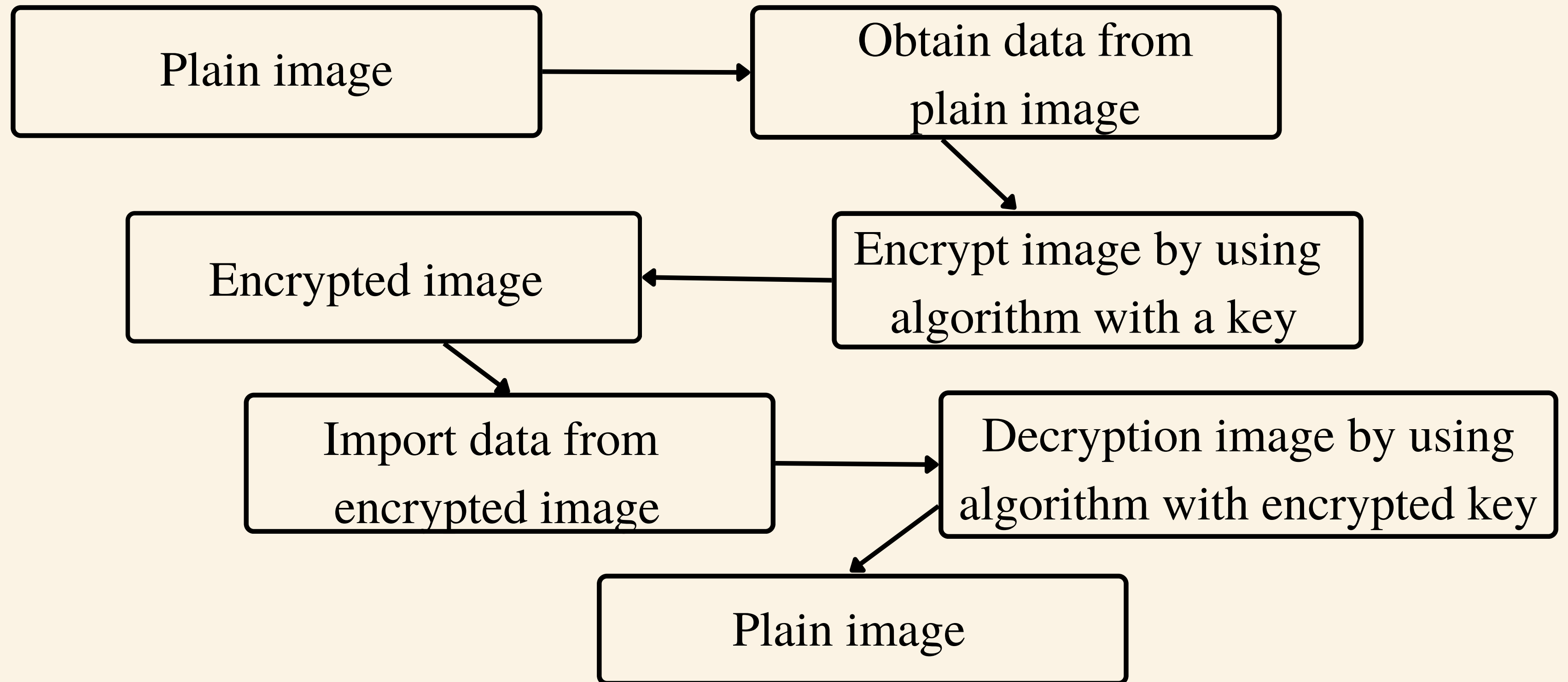
Operating System	:	Windows 10 Pro
Environment	:	JUPYTER
Language	:	React JS

# HARDWARE REQUIREMENTS

This section gives the details and specification of the hardware on which the system is expected to work.

Processor	:	Intel dual core processor
RAM	:	2 GB SD RAM
Monitor	:	17” Color
Hard disk	:	500 GB
Keyboard	:	Standard 102 Keys
Mouse	:	Optical mouse

# system flow diagram



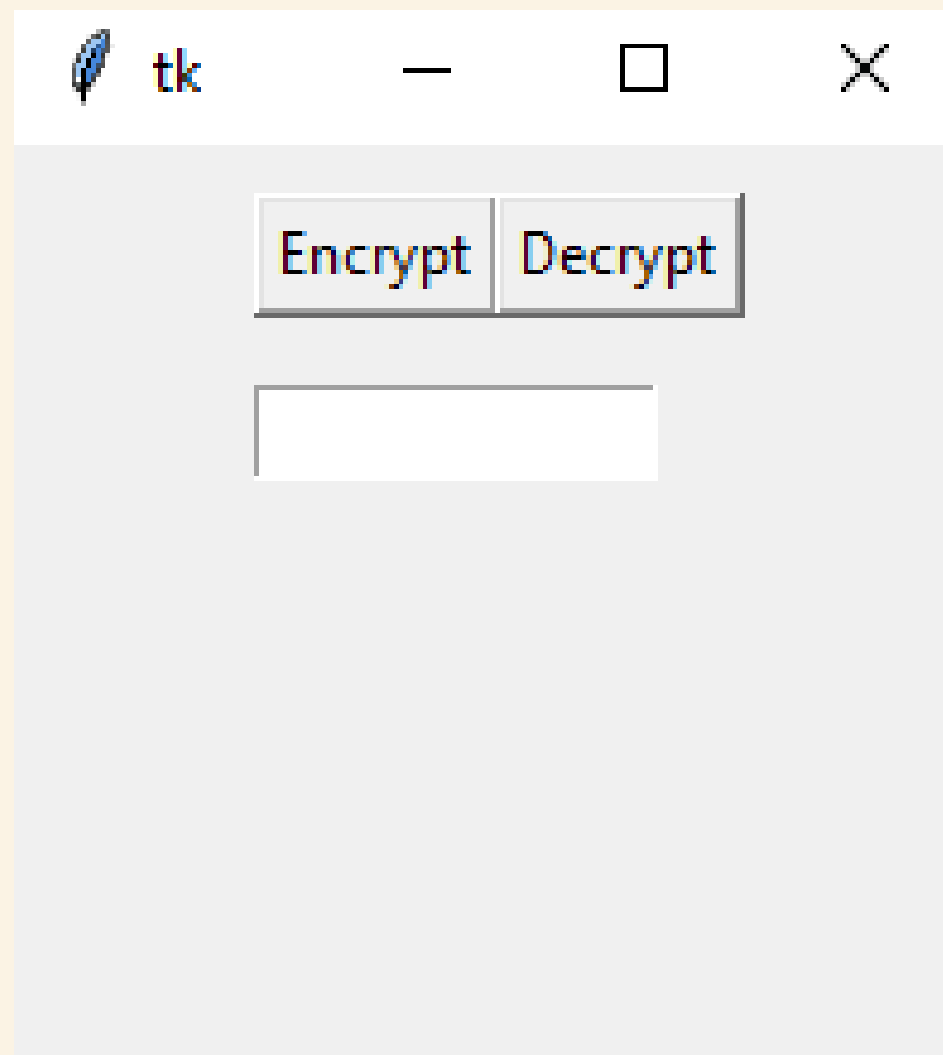
# working module

Working has been processing in 2 ways

1.Encryption process

2.Decryption Process

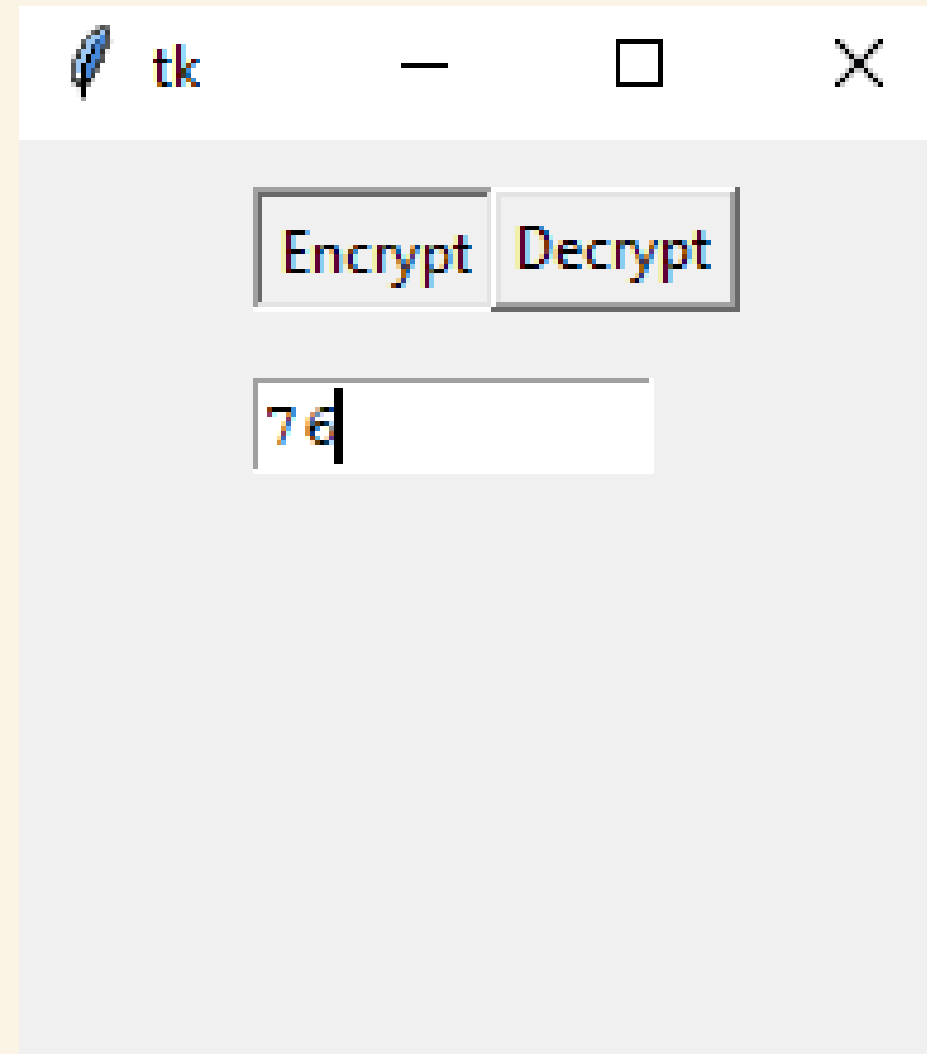
Encryption & decryption tab



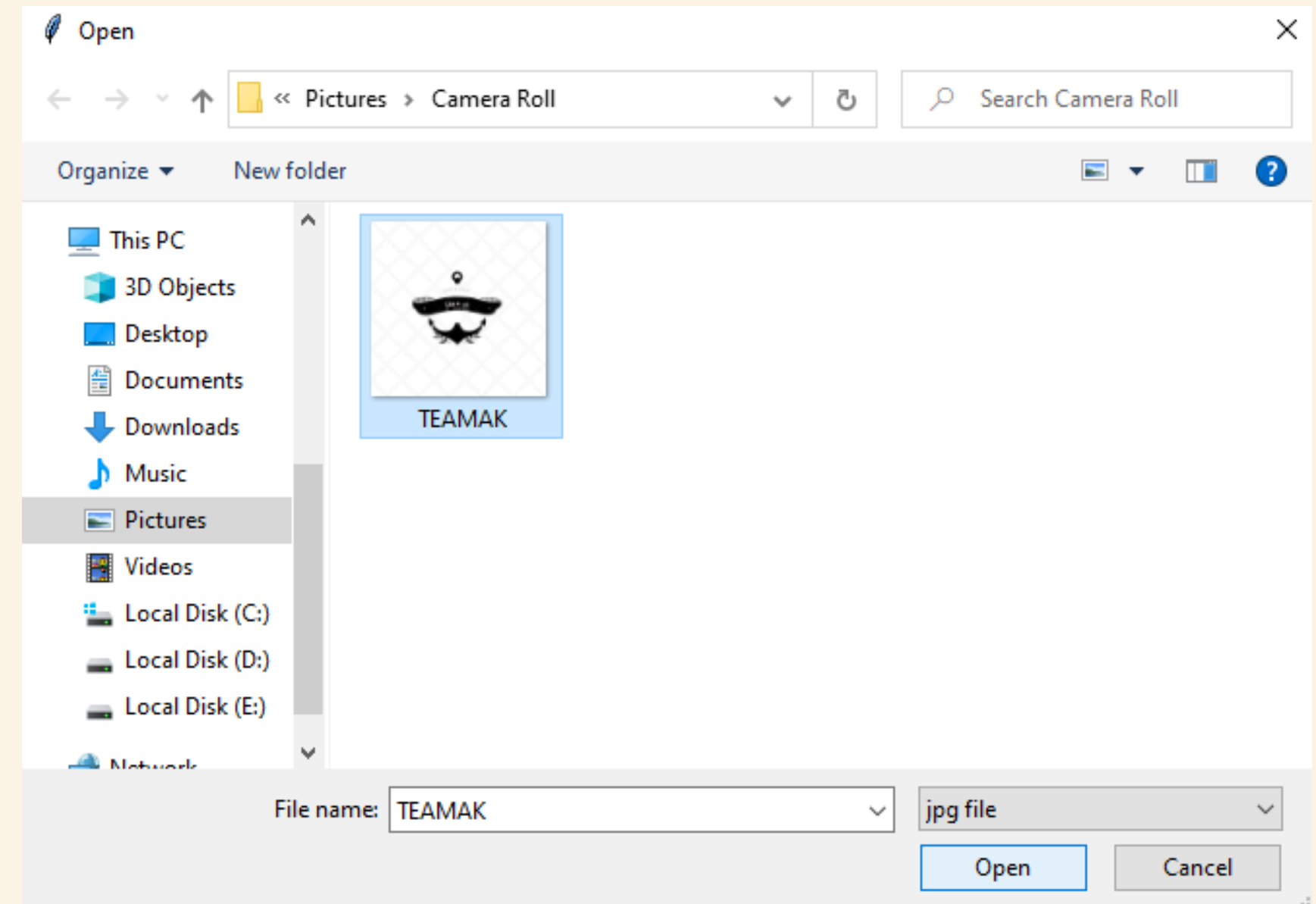
# 1. Encryption process

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Giving value for encryption



Selelcting image for encryption

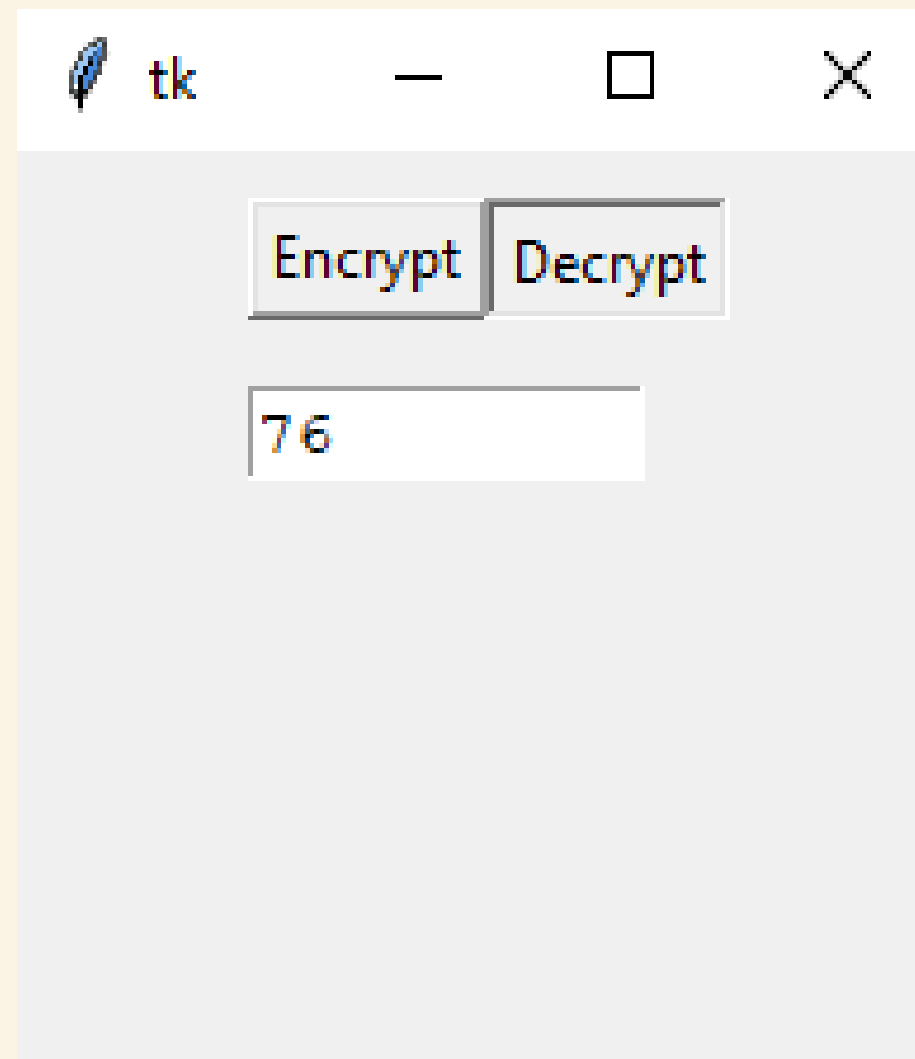




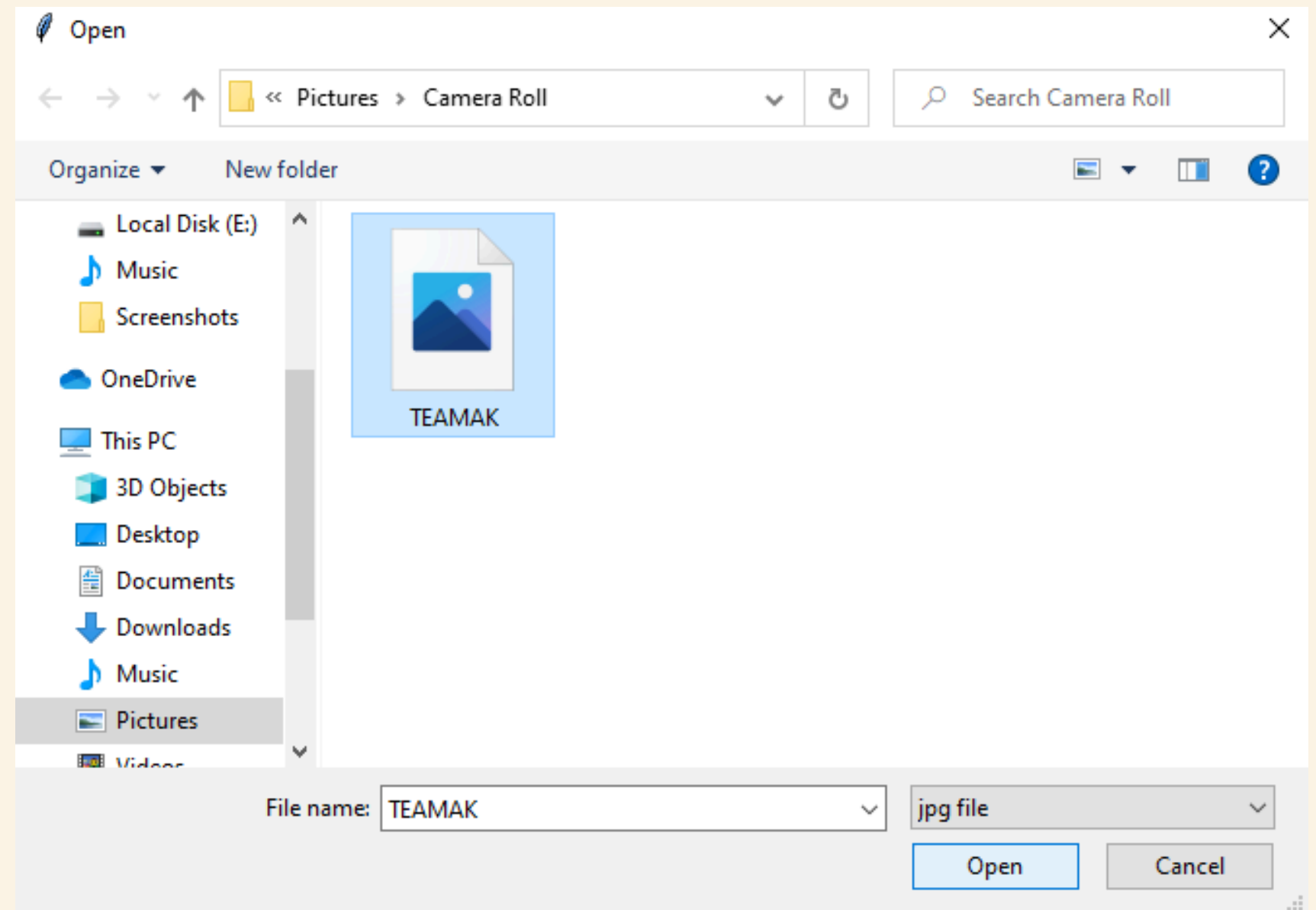
## 2. Decryption Process

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Giving value for decryption



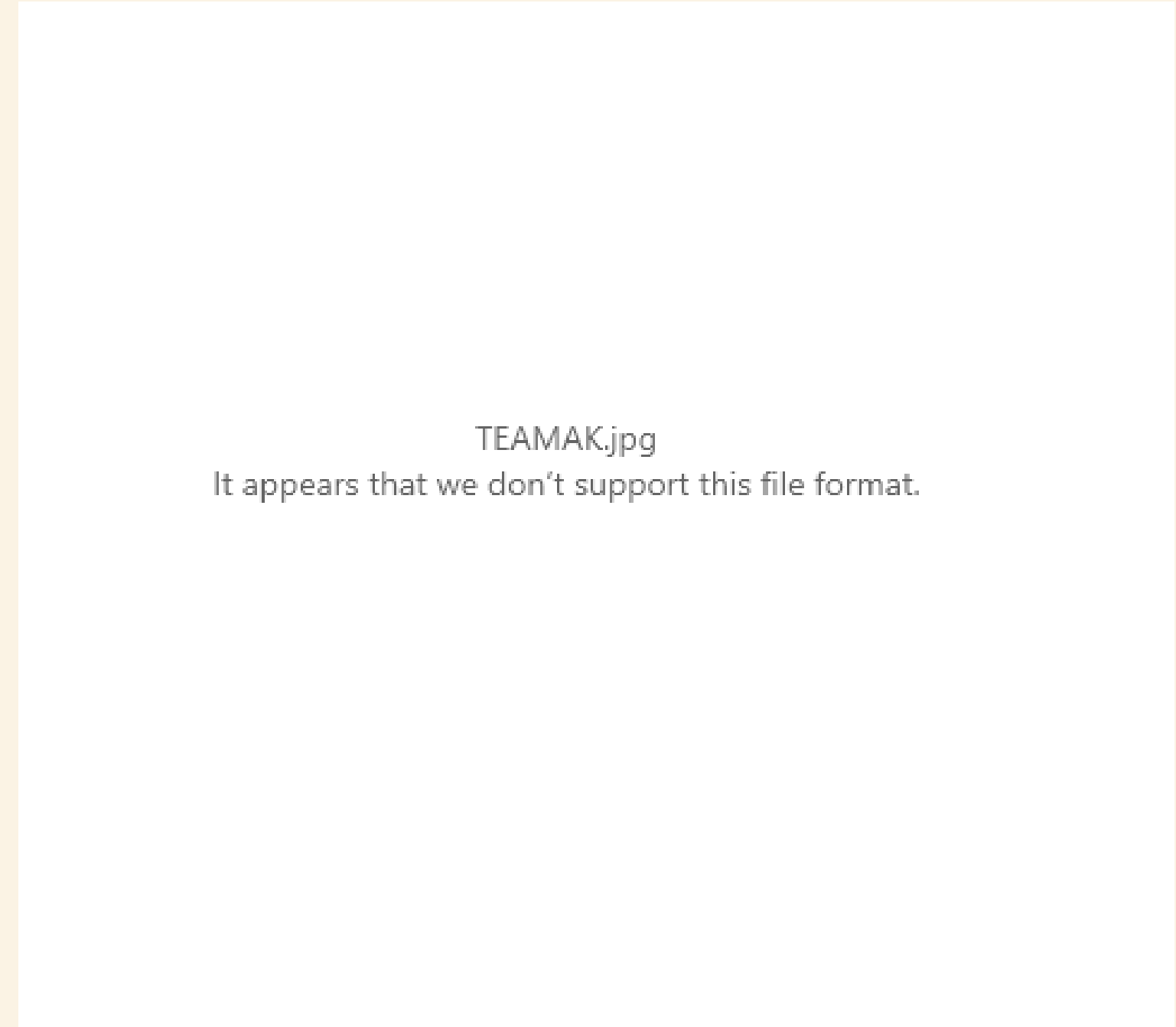
Selelcting image for decryption



# Output Screenshots



Before encryption



After encryption

TEAMAK.jpg  
It appears that we don't support this file format.

Before Decryption



After Decryption

# CONCLUSION

The Encryption and Decryption has been executed successfully as per the requirement. Image had converted into unreadable format by encryption process. Therefore, no hacker and service administrators and others, have access to original message or any type of transmitted information through public networks such as internet. The Encrypted image has converted to the readable format by decryption process.

# Future enhancement

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- In this method we have applied key which can accept only the integer value in future we will try to alter the key which can accept the string ..
- This time we have used symmetric key for the encryption and decryption. In future we will try to use the asymmetric key for the encryption and decryption

# References

- Norouzi, Benyamin, et al. "A novel image encryption based on row column, masking and main diffusion processes with hyper chaos." *Multimedia Tools and Applications* 74.3 (2015):781-811.
- Tong , Xiao-Jun , et al . " An image encryption scheme based on a new hyperchaotic finance system. " *Optik-International Journal for Light and Electron Optics* 126.20 (2015): 2445-2452.
- Zhang, Xuanping, et al. "A chaos-based image encryption scheme using 2D rectangular transform and dependent substitution." *Multimedia Tools and Applications* 75.4 (2016): 1745-1763.

THANK

YOU