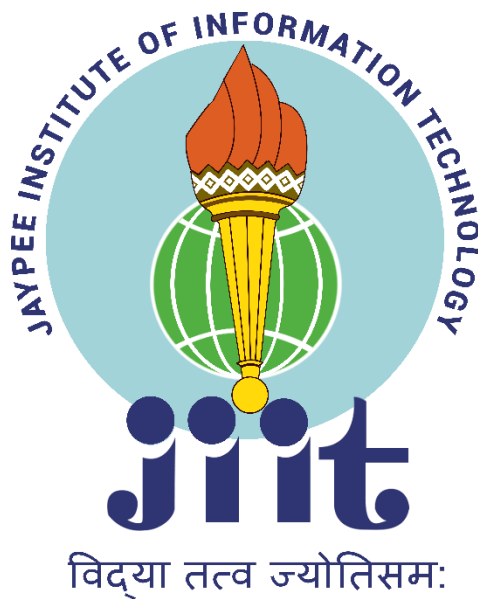# JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY, NOIDA

INFORMATION SECURITY (15B17CI576)

Project Title: Image Encryption and Decryption

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1. INTRODUCTION

In the current trends, the technologies have been advanced. Most of the individuals prefer using the internet as the primary medium to transfer data from one end to another across the internet. There are many possible ways to transmit data using the internet like: via e-mails, sending text and images, etc. In the present communication world, images are widely in use.

However, one of the main problems with sending data over the Internet is the 'security' and authenticity. Data security basically means the protection of data from unauthorised users or attackers. As a result, different security techniques have been used to provide the required protection. The security of digital images has attracted more attention recently, and many different image encryption methods have been proposed to enhance the security of these images.

Encryption is one of the techniques for information security. Image encryption is a technique that converts the original image to another form that is difficult to understand. No one can access the content without knowing a decryption key. On the other hand, image decryption retrieves the original image from the encrypted one. Image encryption has various applications in the corporate world, health care, military operations, and multimedia systems.

2. PROBLEM STATEMENT

The purpose of this project is to provide effective image data encryption with the aim of resisting statistical attacks and data breaches. This will enable the communicating parties to exchange sensitive data without leaking the data.

The underlying respective architecture of most IT systems, including the desktop computer and internet, does not guarantee security. Users with malicious intents have always found a way of exploiting one vulnerability or the other. An attack that affects the confidentiality of information often presents the platform for the integrity of such information to be compromised. Intercepted information on transit would make little or no sense to an interceptor if he is not able to decipher the content of the information. This explains why it is very necessary to ensure that even when an intruder or unauthorised user successfully obtains access to some information the confidentiality and integrity of the information remain uncompromised.

3. MOTIVATION

As digital images play an important role in multimedia technology, it becomes more important for the user's to maintain privacy. And to provide such security and privacy to the user, image encryption and decryption is very important to protect from any unauthorised user access. Providing security to the users so that no one can access the image which is in the open network. It is very important to affirm the integrity and confidentiality of the digital image that is being transmitted. Information has to be accessed only by the authorised party and not by anyone else such that no one can access the content in between.

4. OBJECTIVE

The model for encryption and decryption of an image is designed with the following objectives:

- For transmission of the image based on data as well as storage it should have confidentiality and security by using a suitable key.
- To study the architecture of the image file.
- The main objective of this image encryption method is to obtain a top quality hidden image in order to keep information secret.
- Many factors have to be considered in order to develop the application such as processing speed of image, the strength of encryption result and ease of use to end users.

5. METHODOLOGY

- Get the image to be encrypted from the user by displaying a GUI for the user to select an image from its system , Processing a deciphered image for the receiver on key.
- Converting the image to a matrix with each value in it having RGBA values of each pixel.
- Transforming this matrix to encrypt its values using any of the suitable cipher techniques.
- Processing the new encrypted image through this matrix.
- For decrypting an image, We input the key from the receiver and generate the original image only in case the key matches.

6. FEATURES/APPLICATIONS OF PROJECT

1. Creating a Strong Encrypting image so that it cannot be hacked easily.
2. Perfection in the original image obtained after decrypting the original image.
3. Maintaining an individual's privacy, especially on social media platforms
4. Image encryption has applications in the corporate world, health care, medical images, military operations, and multimedia systems.

## 7. TECHNOLOGIES USED

1. Java Swing
2. VS Code

➢ **Software Requirement**
   ❖ Operating System – Windows 10/11
   ❖ Language and frameworks - Java
   ❖ IDE – Visual Studio Code

➢ **Hardware Requirements:**
   ❖ Processor – 11th Gen Intel(R) Core ™ i5-1135G7 @2.40GHz 2.42 GHz
   ❖ Installed RAM – 16GB
   ❖ System Type – 64 Bit Operating System, x64 based processor

8. IMPLEMENTATION AND RESULT

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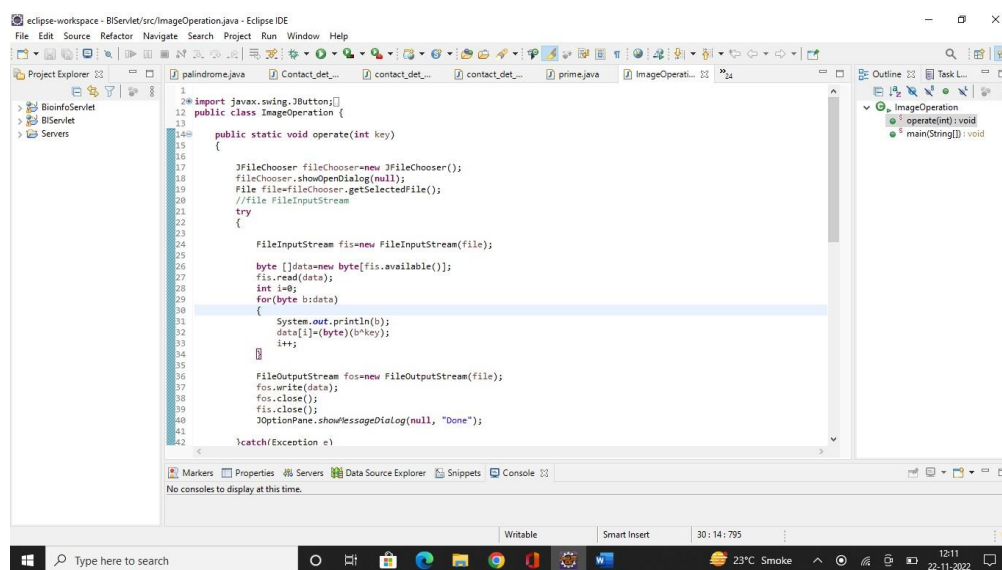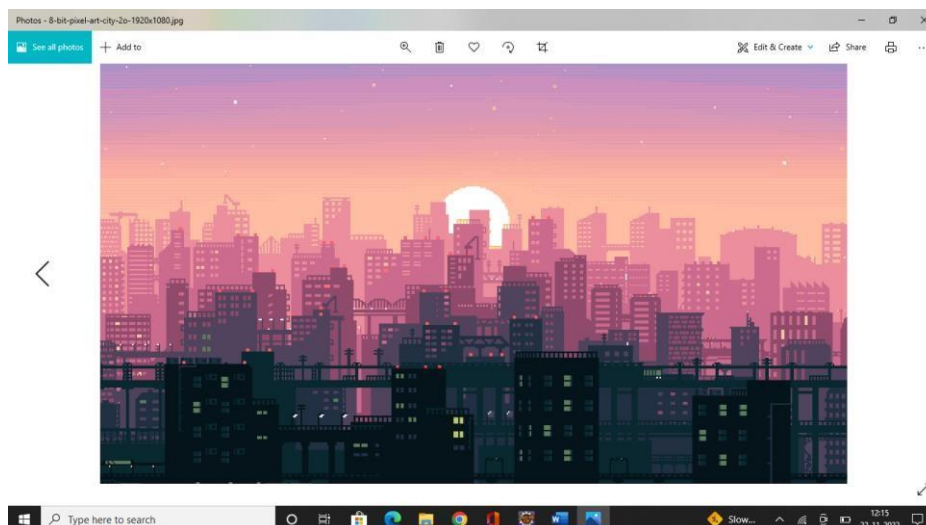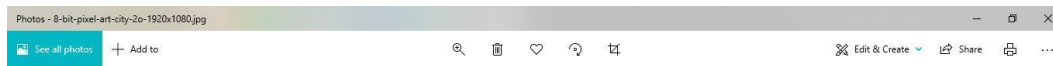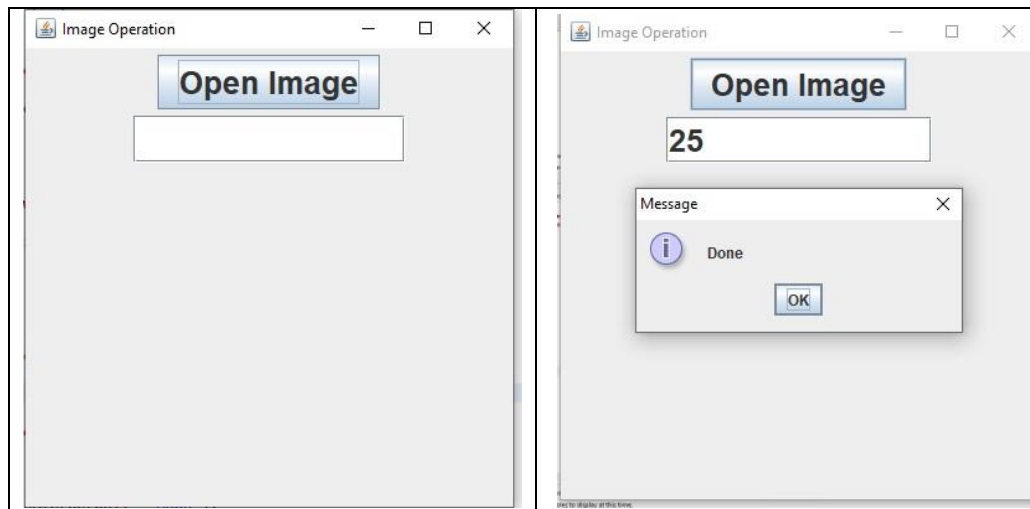
9. CONCLUSION

The image encryption and decryption algorithm is designed and implemented to provide confidentiality and security in transmission of the image.

10. REFERENCES

[1] https://www.iosrjournals.org/

[2] https://www.researchgate.net/

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