



STEGANOGRAPHY

“Art of hiding messages”

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WHAT IS STEGANOGRAPHY?

- “**Steganography** is the art and science of writing hidden messages in such a way that no one, apart from the sender and intended recipient, suspects the existence of the message, a form of security through obscurity.”

-Wiki

- Text and images can be hidden in cover images.
- The hidden message can be retrieved by the recipient using a secret password shared between them.

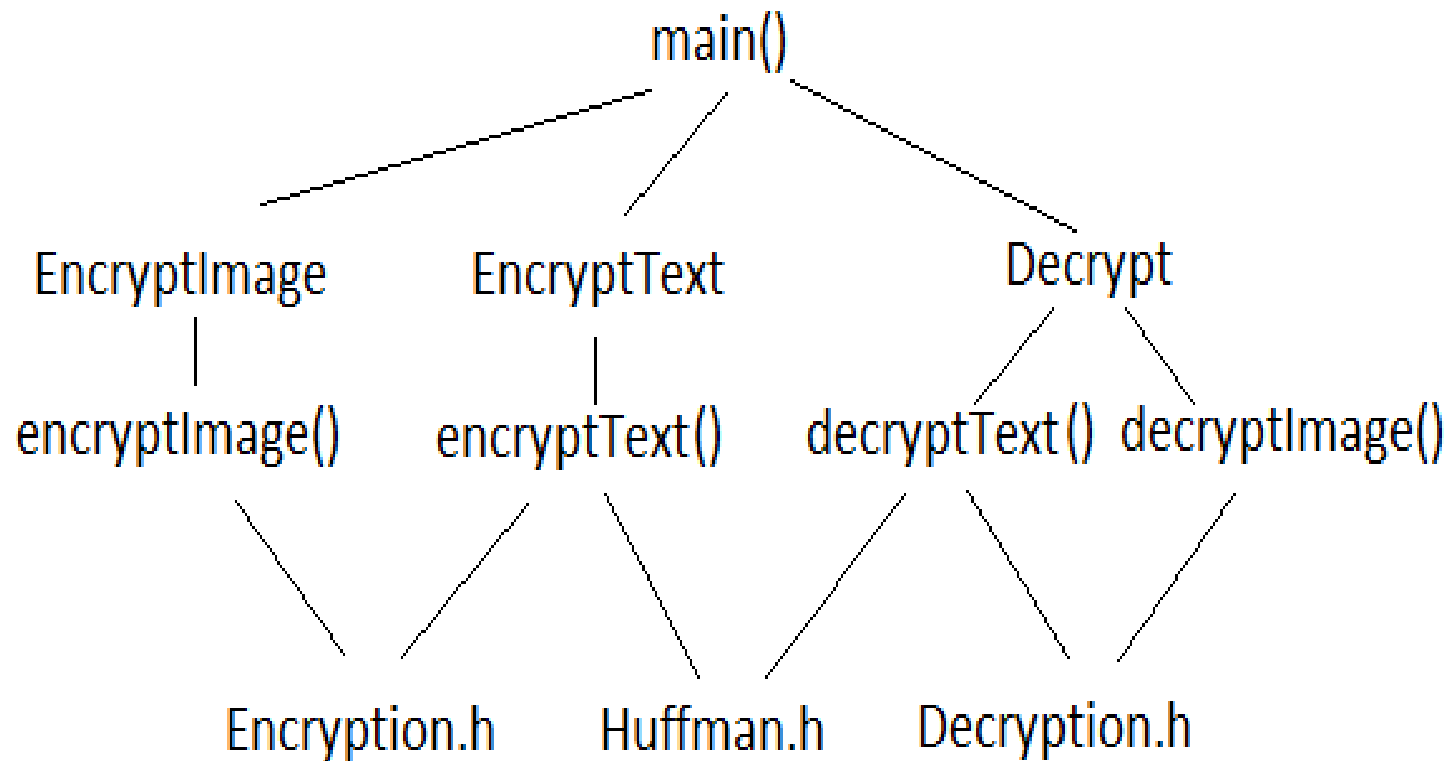


WHAT IS ACCOMPLISHED

- Text message can be hidden in a image with non-lossy compression.
- A small image can be hidden in a larger image with non-lossy compression.
- Huffman encoding is done to improve the payload.
- Standard LSB insertion algorithm is used.
- Password is used to secure the message.
- There is no change in the size of the cover image.
- The change in the image cannot be detected by a normal human eye.



STRUCTURE OF CODE



HUFFMAN COMPRESSION

- The number of characters that could be stored on an image is approximately $(\text{no_of_pixels}/8)$.
- Huffman Compression on an average compresses the file by 70% (by test cases).
- Thus the payload increases by 1.43.



IMAGE FILE SIZE

- The number of pixels of cover image required to store a pixel of hidden image is 24.
- Therefore, given an cover image of $h*w$, we can hide an image of $(h/5)*(w/5)$ in the cover image.



SAMPLE INPUT



SAMPLE OUTPUT OF ENCRYPTED IMAGE



PROTECTION LEVEL

- Invisibility-high
 - Only LSB is changed.
 - Only half the bits are changed.
- Payload capacity-high
 - Huffman encoding is done to improve the payload.
- Robustness against statistical attacks-high
 - Randomization makes the robustness higher.
- Robustness against image manipulation-low
 - Modification in image can change the encrypted data.
- Independent of file format-high
 - Support to multiple formats.
 - Eg: bmp, png, tiff, dib, etc.
- Unsuspicious files-high
 - Size of the cover image is unchanged after encryption.



PACKAGES AND DATA STRUCTURES

- Packages
 - OpenCV
 - CodeBlocks IDE
- Data Structures
 - Priority queue
 - List
 - Vector



WORK DISTRIBUTION

○ Aman

- Encryption class
- EncryptText
- EncryptImage
- Main()

○ Sanket

- Decryption class
- Decrypt class
- Huffman class

50%-50%



BIBLIOGRAPHY

- Wikipedia
- OpenCV wiki
- Google

