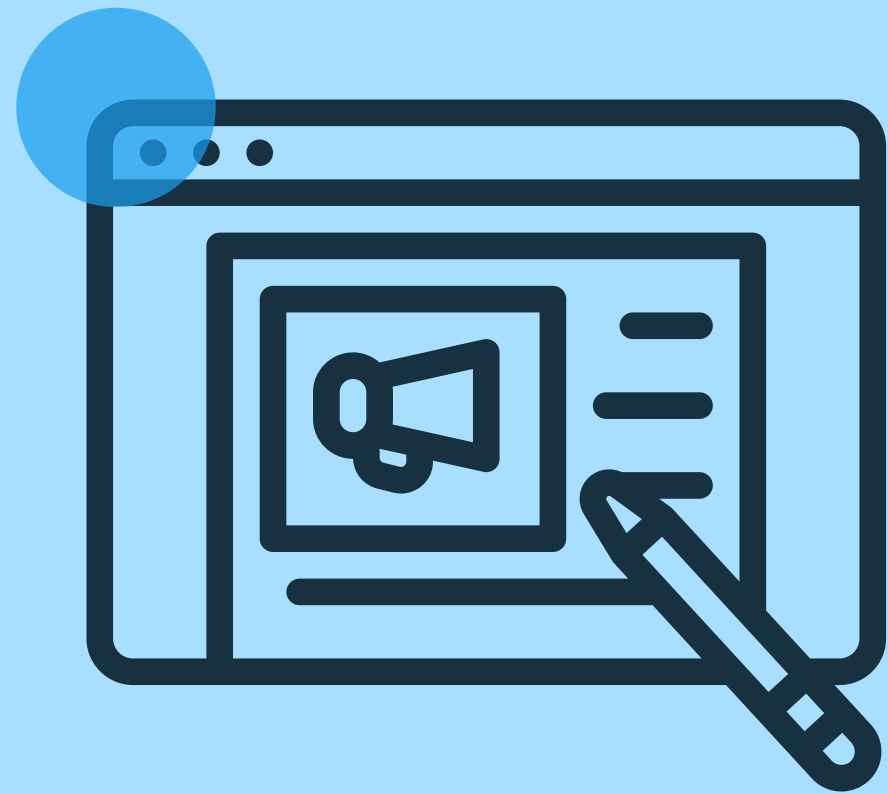# Steganography
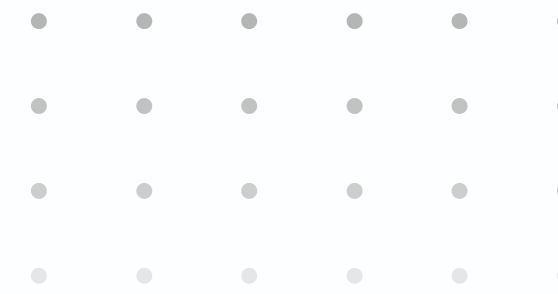
What is it?

the technique of hiding secret data within an ordinary, non-secret, file or message in order to avoid detection; the secret data is then extracted at its destination.
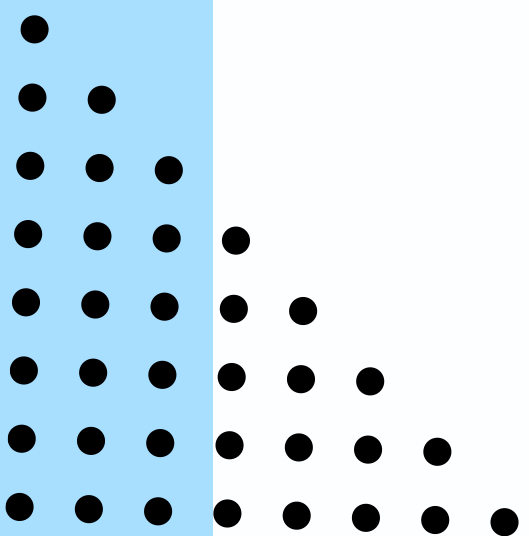
Our group did a image-in-image Steganography, which hides one image into another

There are 2 parts in Steganography

1. Encode (Merge 2 images)
2. Decode (Unmerge to reveal the hidden image)
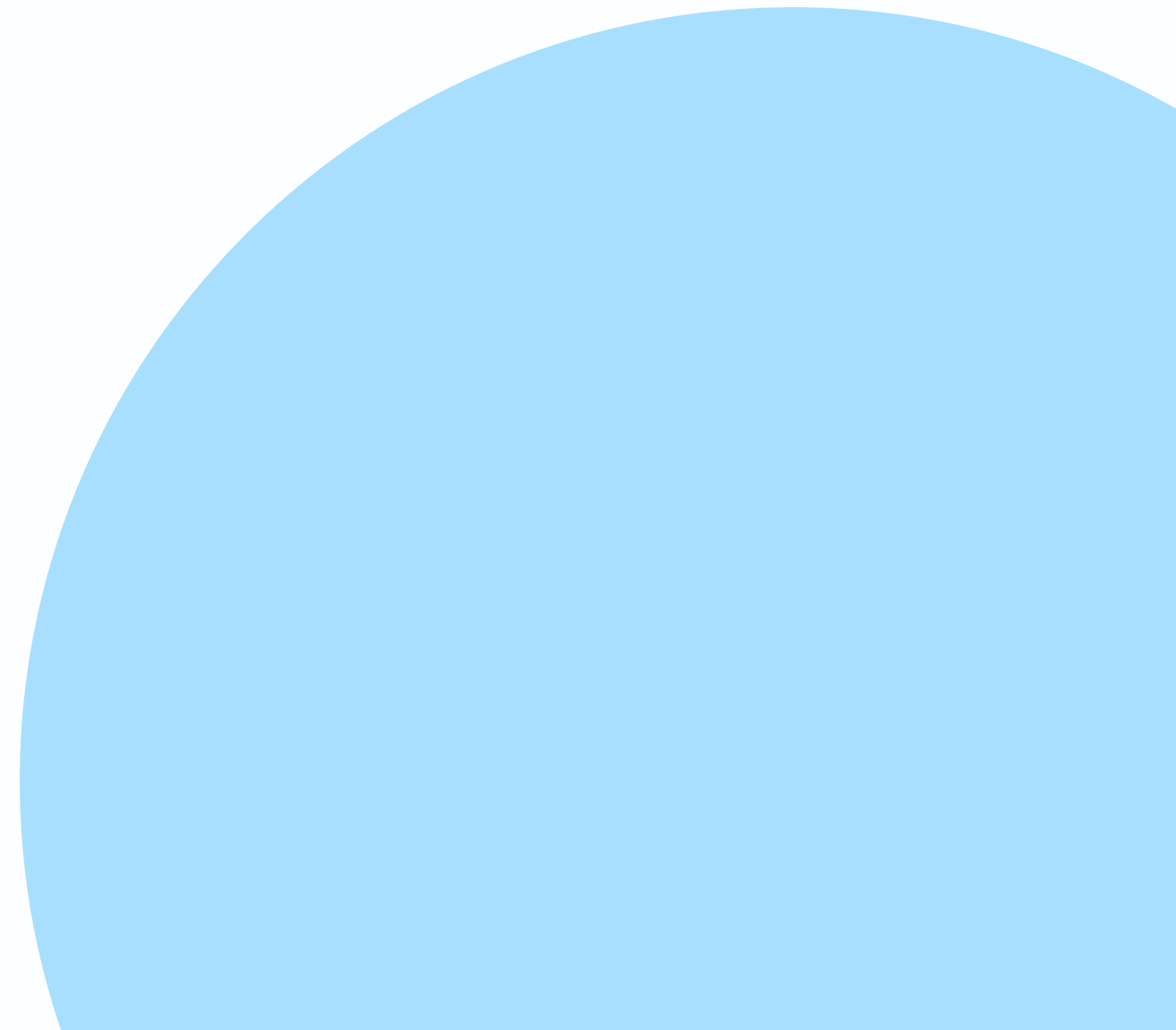
The merge step is done by combining the RGB values together.

Packages Used

Pillow (PIL) library to read and
write images

Detailed Steps

Merge

1. Read image to arrays of RGB
2. Turn the integer RGB into binary values
3. For each pixel, Combine the last 4 bits together (summation)
4. Write it to new image (output)

Unmerge

1. Read image to arrays of RGB
2. Turn the integer RGB into binary values
3. Extract the last 4 bits
4. For each pixel, Concatenate 0000 to the binary values to make it 8 bit

	128	64	32	16	8	4	2	1
8 bit binary digit	1	0	1	1	0	0	0	1
	128 + 32 + 16 + 1 = 177							

The leftmost bit is the most significant bit.

If we change the leftmost bit it will have a large impact on the final value.

On the other hand, the rightmost bit is the least significant bit.

If we change the rightmost bit it will have less impact on the final value.

Pixel from Image 1

R(11001010)
G(00100110)
B(11101110)

Pixel from Image 2

R(00001010)
G(11000001)
B(11111110)

New pixel from the new Image

R(11000000)
G(00101100)
B(11101111)

Program Demo

Sources

kelvins/steganography: Steganography: Hiding an image inside another (github.com)