

SF LAB II
Experiment 1

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Introduction

Steganography is used for hiding a message in such a way that someone can not know the presence of the secret message.

Why do we use Least Significant Bit Steganography?

The Least Significant Bit (LSB) is a technique in which the last bit of each pixel is modified and replaced with the secret message's data bit. Suppose 255 representation in binary is

1	1	1	1	1	1	1	1
MSB							LSB

If we change the MSB bit from 1 to 0 then the value becomes 127 (99.99 % change) But if we change the LSB bit from 1 to 0 then the value becomes 254(very fewer changes in value) that's why we use LSB for hiding the secret message.

Working :

Step 1:For Hiding secret message in the image first we have to import all the python libraries

Step 2: Upload the image that u want to use in steganography.

Step 3: Use prime number as a key

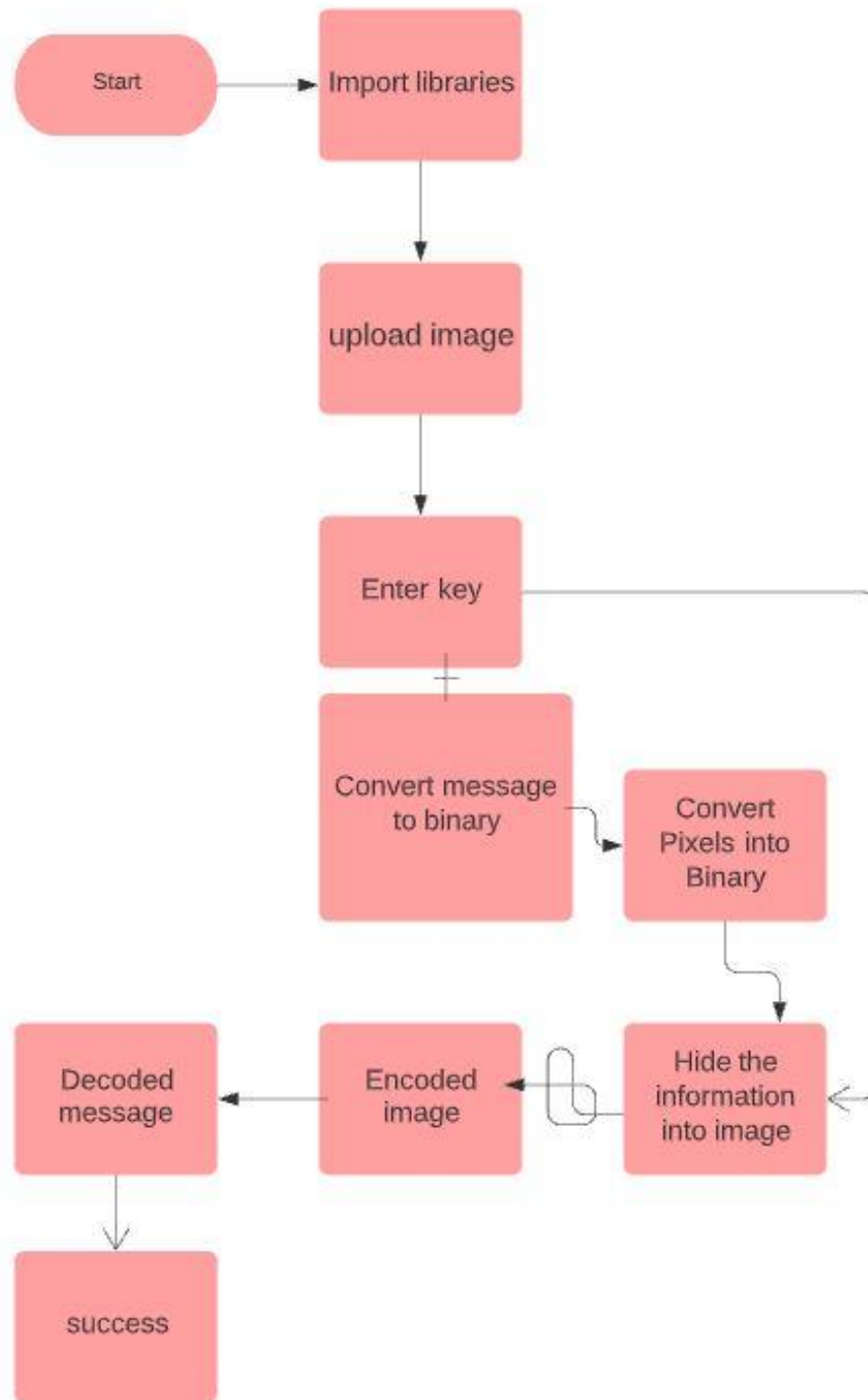
Step 4: convert the secret message and image pixels into binary

Step 5: Hide the secret message into the image by altering the LSB

Step 6: retrieve the hidden message from the stegno image.

Step 7: compare the images(before encoding,after encoding).

Flow chart :



Algorithm

Keyset

Initialize keyset with a start value of row and column and key-value key set(start_x,start_y, key) where a key is a prime number.

Encoding

Start with data_index =0, take an input _image and message and convert into binary_message.

Then check if the image is RGB then Access each pixel on the gap of key, Extract each channel from the pixel and convert each channel into an 8-bit Binary string then modify the LSB of each channel with binary_message

If an image is a single-channel image (grayscale image) then access each pixel on the gap of key, Extract each pixel and convert it into a binary string then modify the LSB of each pixel with binary_message.

Decoding

If the input image is RGB then access each pixel on the gap of the key Extract each channel from pixel and convert each channel into 8 bit binary string append LSB of each channel into a resultant string then convert this resultant string into a character string.

If the input image is not RGB then access each pixel on the gap of key, extract each channel from pixel convert each pixel binary string and append LSB of each pixel into a resultant string then convert this string into char string.

Output :

From KeySet Generate a key that is a private key set for sender and receiver.

Enter the required keyspace separated by space i.e

1) Start x position

2) Start y position

3) Secret Key

Note : start x and start y should not be prime no. and Secret key should be prime number

2 4 7

Encode message in Grayscale image using keyset.

Shape of given image is (256, 256)

Enter your message to be encrypted : welcome to iitbbs(Satendra)



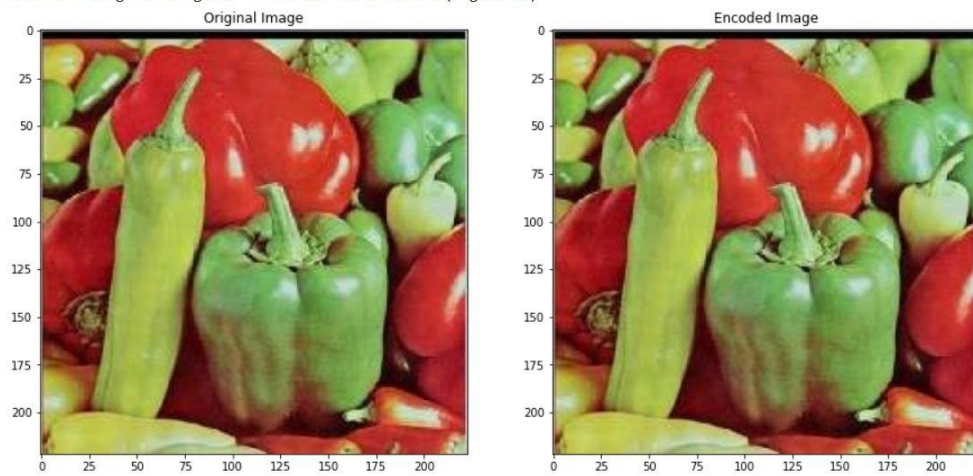
Decoded message of image is : welcome to iitbbs(Satendra)



Encode message in RGB image using keyset.

```
Shape of given image is (222, 223, 3)
Enter your message to be encrypted : hii welcome to iitbbs(sagtendra)
```

```
Decoded message of image is : hii welcome to iitbbs(sagtendra)
```



Code:

<https://colab.research.google.com/drive/1XvS-bs14XWSKZUL4-FzkwYdcIV5lprhk?usp=sharing>