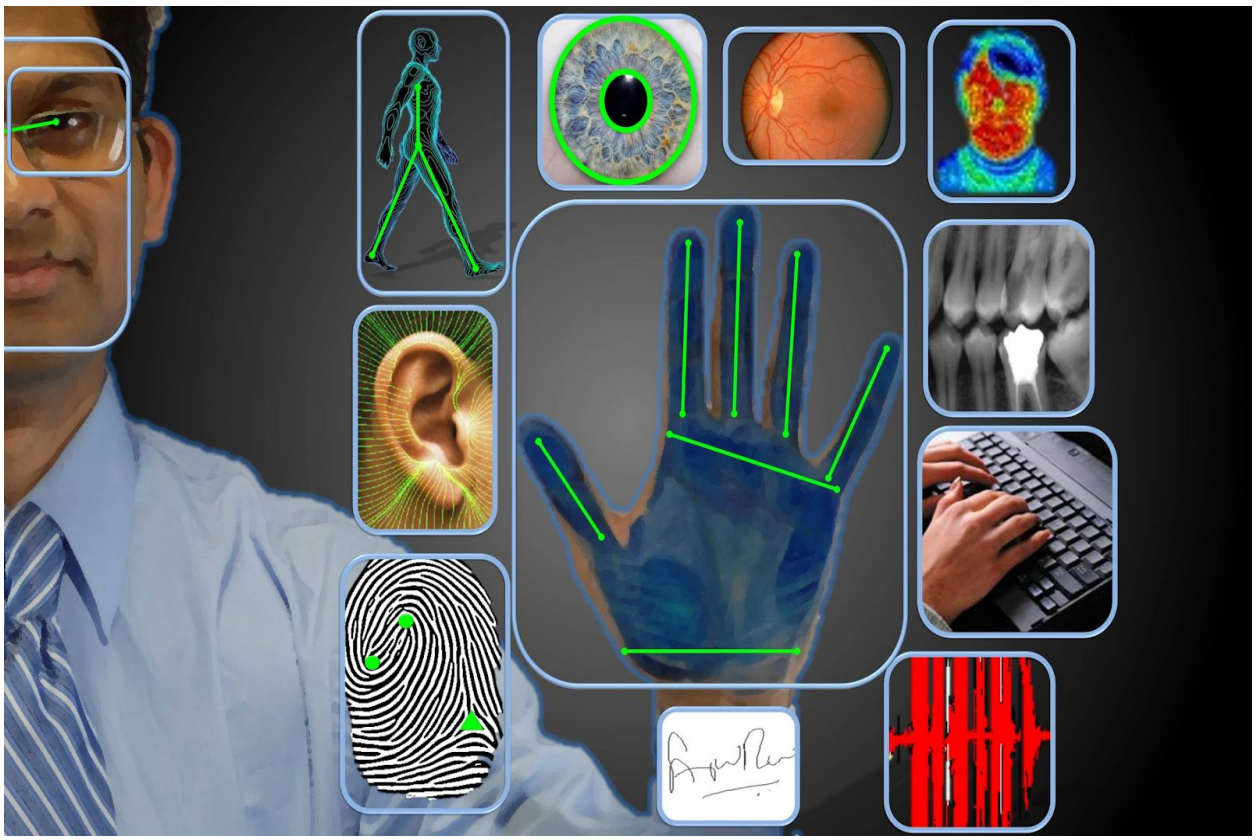


Digital Image Processing

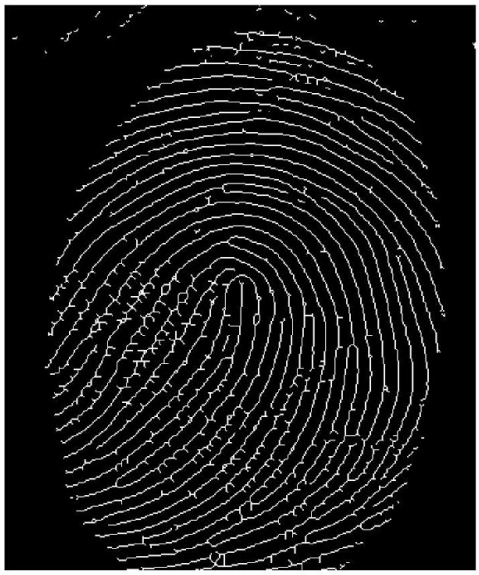
Assignment-4

Atheti Nikhilendra
20161054

Question-1:

Part-1)

Final Skeleton ----->



Part-2)

$$S_1 = \begin{bmatrix} 0 & 0 & 0 \\ * & 1 & * \\ 1 & 1 & 1 \end{bmatrix}$$

S1 removes all the outermost layer pixels which have greater than or equal to three neighbours.

$$S_2 = \begin{bmatrix} * & 0 & 0 \\ 1 & 1 & 0 \\ * & 1 & * \end{bmatrix}$$

S2 removes all the corner pixels in outermost layer.

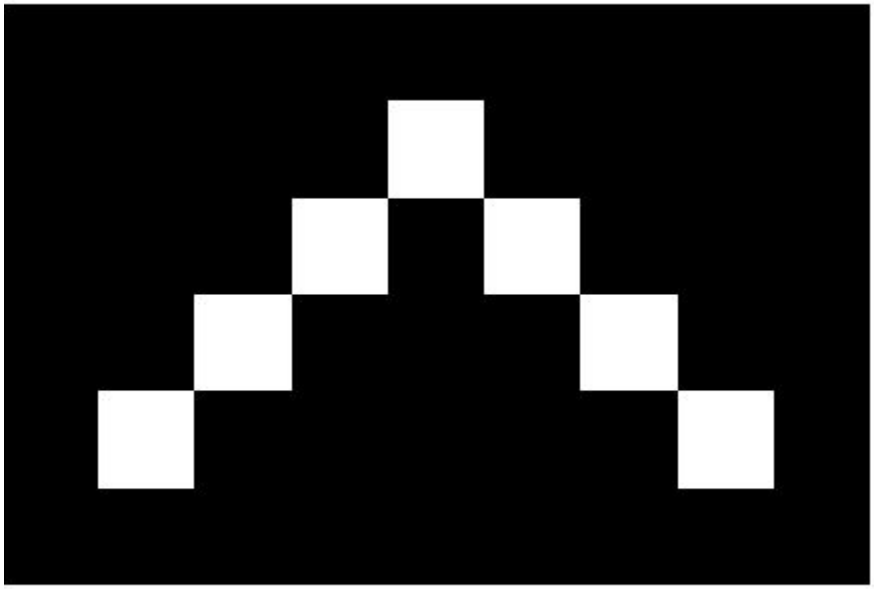
Part-3)

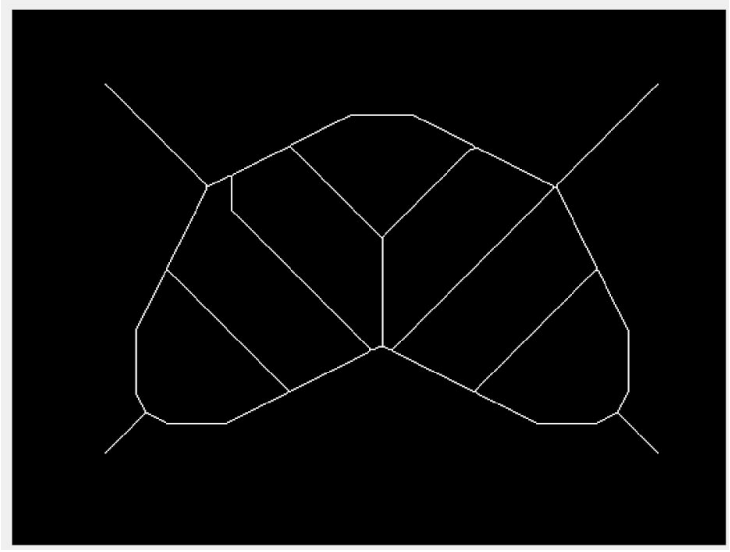
In each iteration of passes, Outermost layer of the image is processed , once it stabilizes it get into next inner outermost layer.

Thus goes on. But the pixels which split the components lies in the interior region. So multiple passes need for processing.

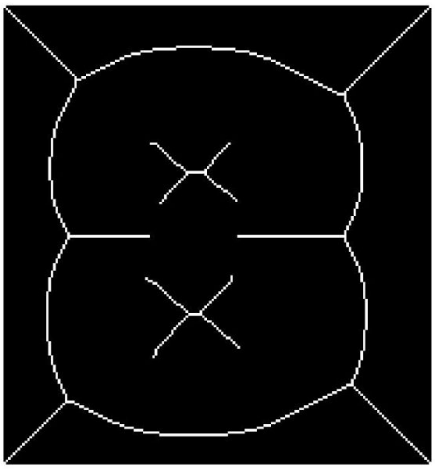
Part-4)

Solid Shape--->

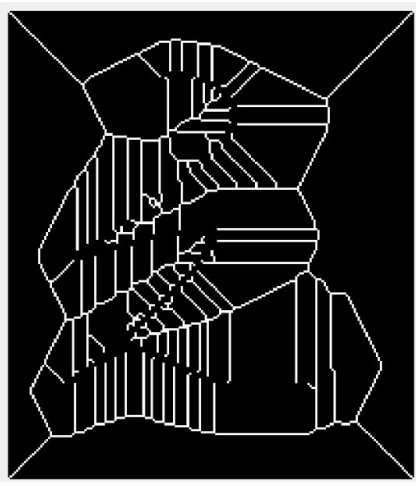




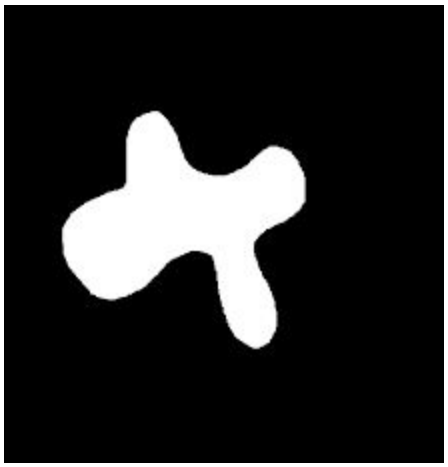
Shape with Holes--->

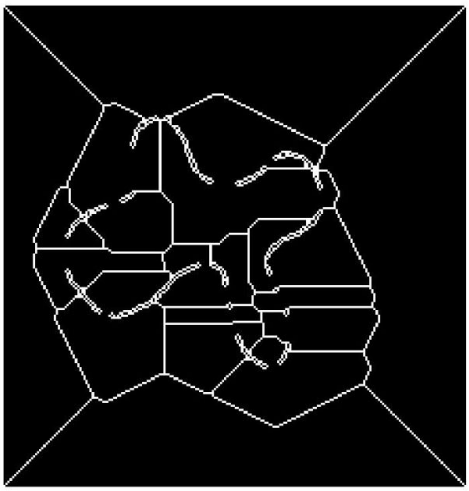


Thin Objects--->



Irregular Objects--->





Question-4:

1) **Afterimage**:

An **Afterimage** is a type of optical illusion in which an image continues to appear briefly even after exposure to the actual image has ended.

There are two types of Afterimages. They are 1)Positive Afterimages 2) Negative Afterimages.

Positive AfterImage: In a positive afterimage, the colors of the original image are maintained. Essentially, the afterimage looks the same as the original image. You can experience a positive afterimage yourself by staring at a very brightly lit scene for a period of time and then closing your eyes.

Negative AfterImage: In a negative afterimage, the colors you see are inverted from the original image. For example, if you stare for a long time at a red image, you will see a green afterimage

2) **Color Moire**:

Color moire is artificial color banding that can appear in images with repetitive patterns of high spatial frequencies, like fabrics or picket fences. It often looks like a rainbow or a rippling of weird color over fabric. This happens most readily with very fine patterns or fabric with a high level of seen.

3) **Structural Coloration**:

Structural coloration is the production of colour by microscopically structured surfaces fine enough to interfere with visible light, sometimes in combination with pigments.

Question-5:

Montage of increasing Hue {60 → 150} corresponding rgb;

From the above montage we can see that change is in rapid at start and end but very slow in the middle.

So, here we can observe that Hue is not perceptually uniform.

Montage of RGB using HSV model;

To make it perceptually uniform we can take change Intensity along with Hue in this color model,

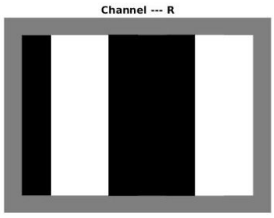
Or we can change color model to which is perceptually uniform like HSV or CIELab etc.

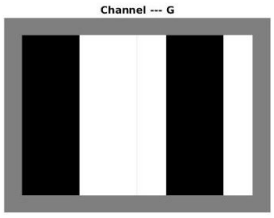
Question-6:

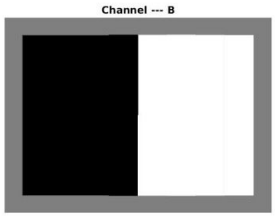
Part-1):

Color_bars.tif ------->

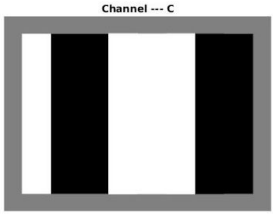
RGB

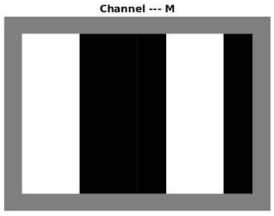


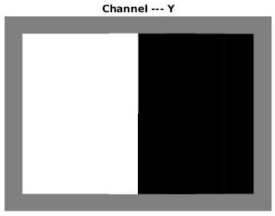




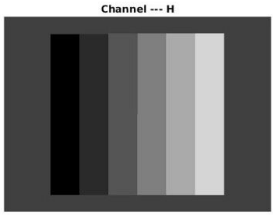
CMY

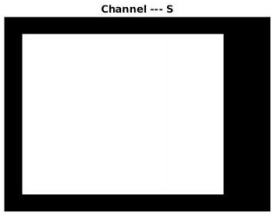


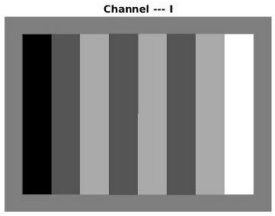




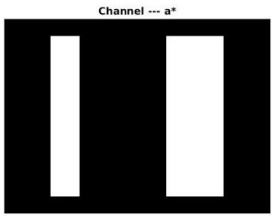
HSI

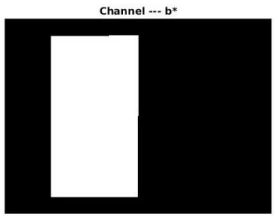






L*a*b*

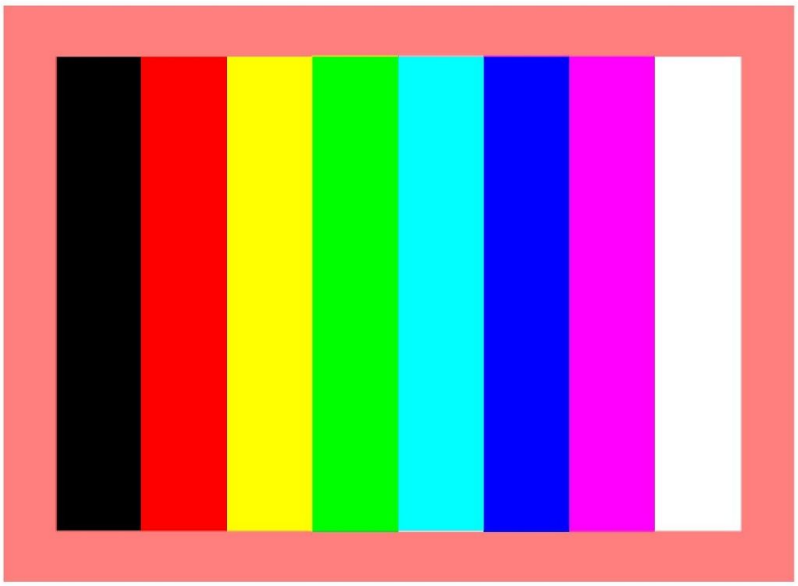




Part-2)

Safe RGB color model…

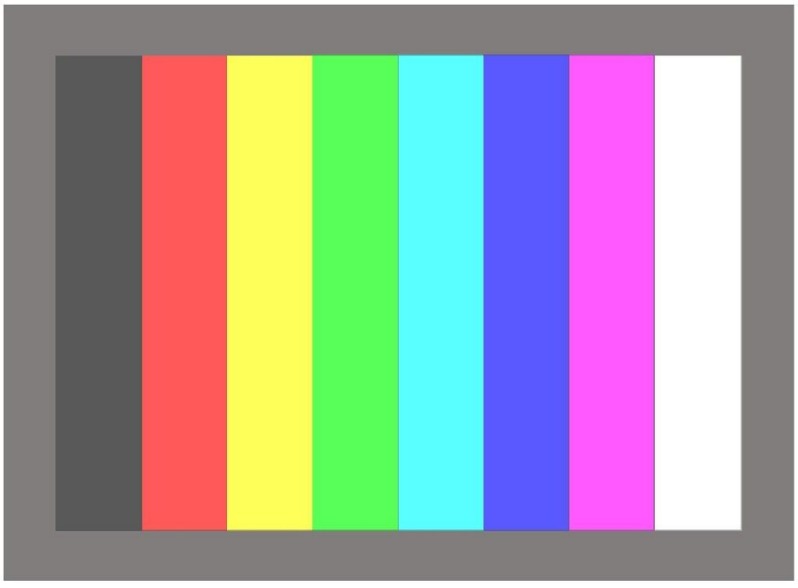
On color_bars.tif ------>



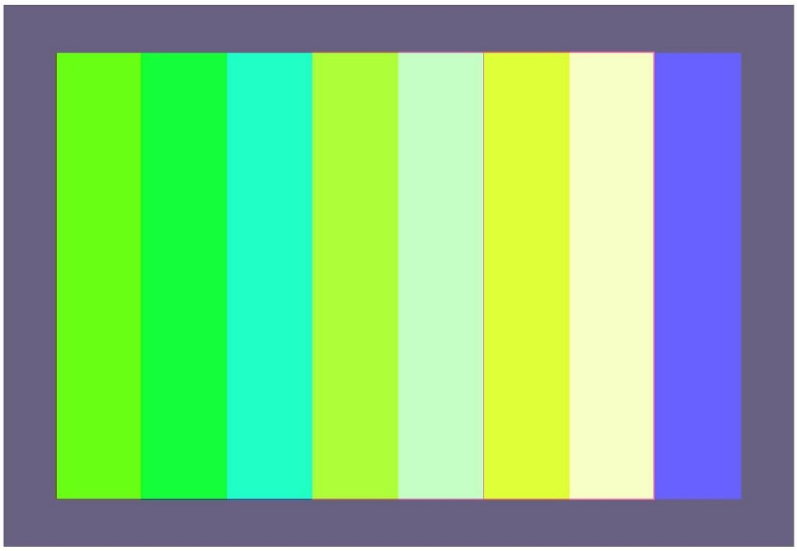
Part-3)

Histogram Equalization of RGB, HSI models of color_bars.tif image.

RGB ---->

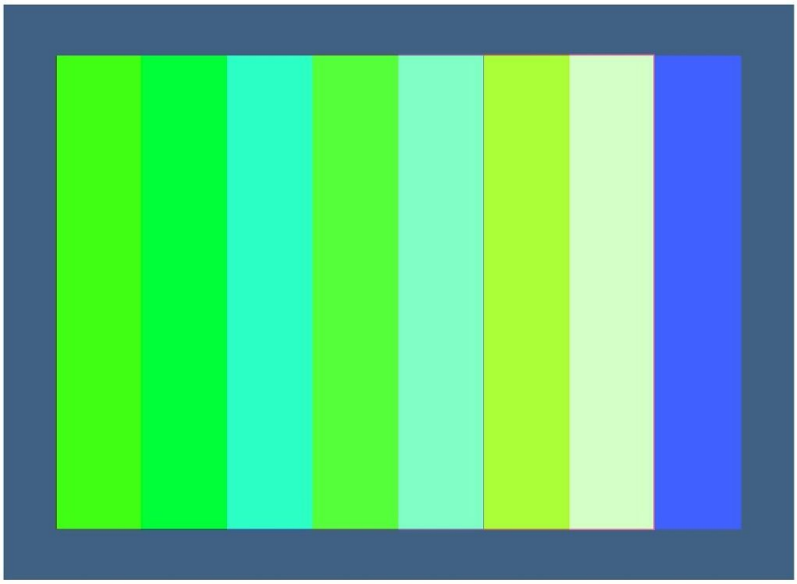


CMY ---->

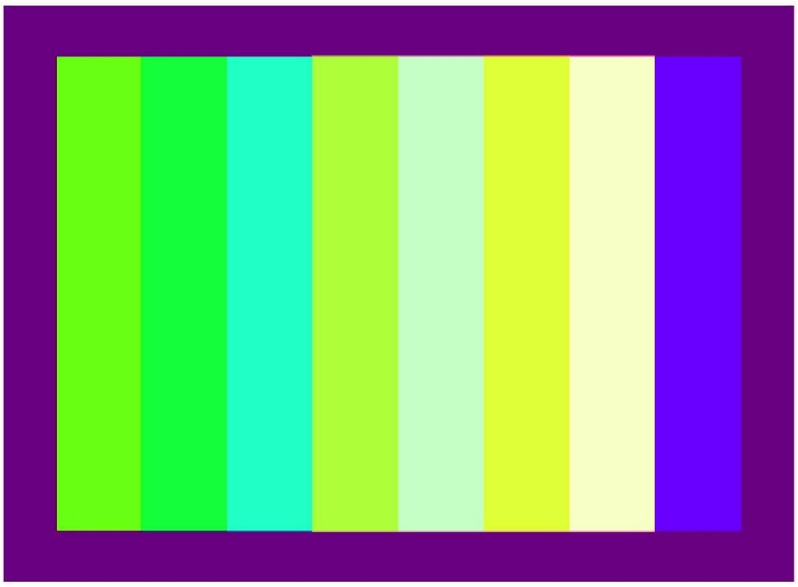


Part-4)

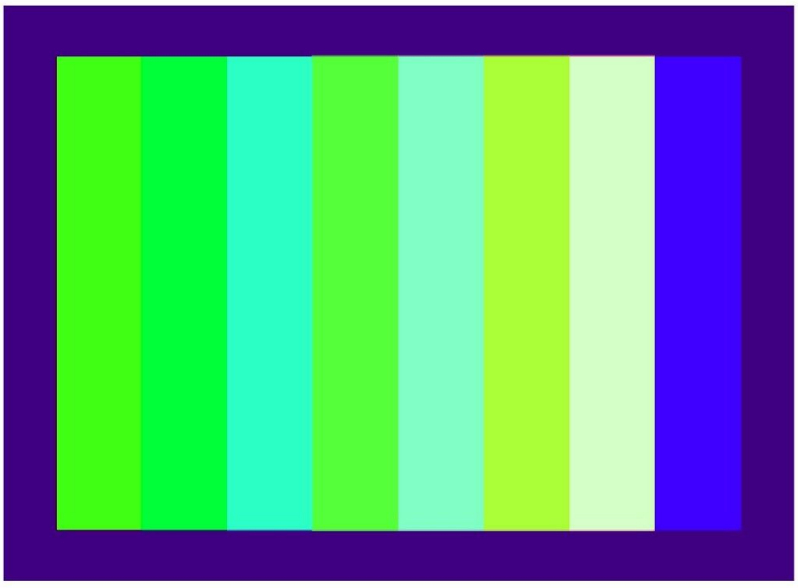
(a) H channel is not changed



(b) S channel is not changed.



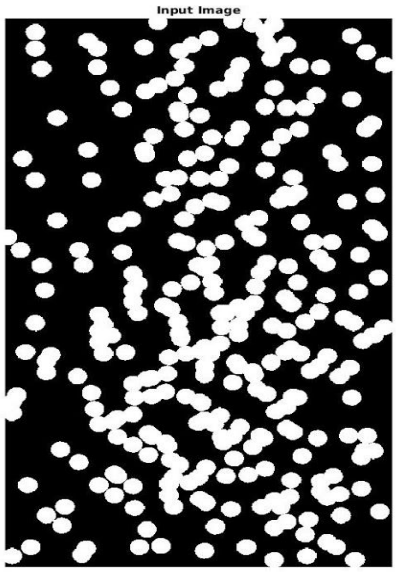
(c) H and S both not changed.

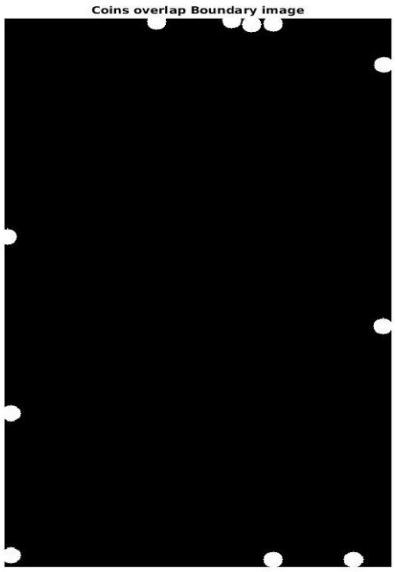


Question-2:

Part-1)

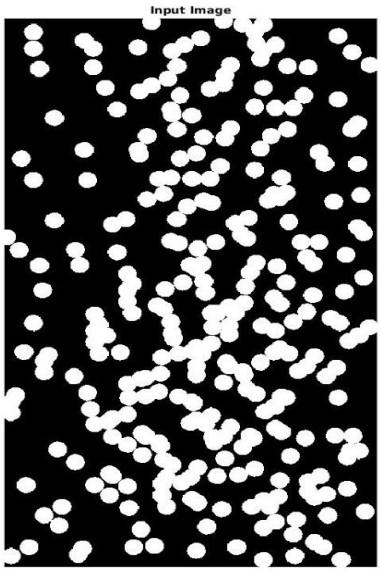
Common with Boundary….

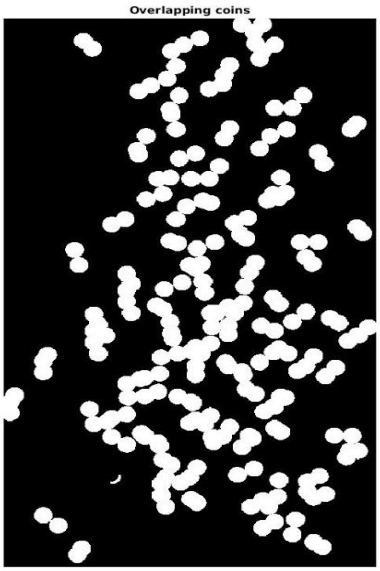




Part-2)

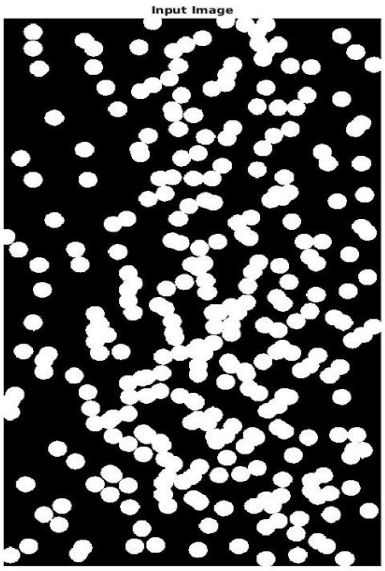
Overlapping with each other….

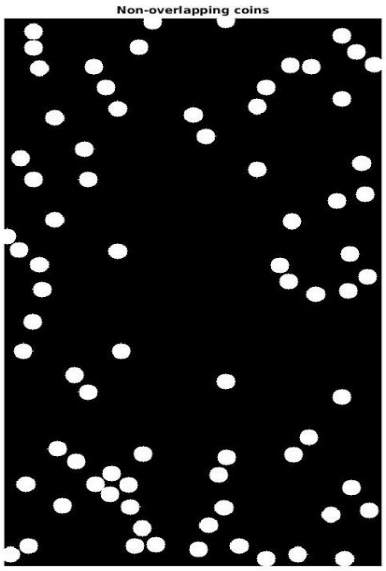




Part-3)

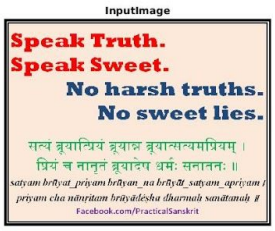
Non-overlapping each other…..

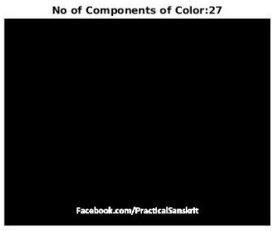


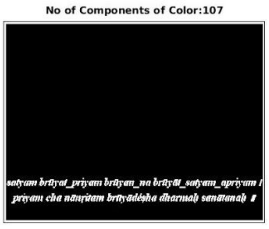


Question-3:

Part-1)

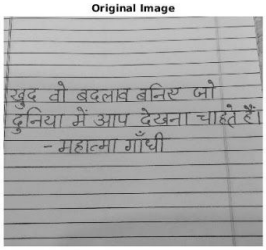




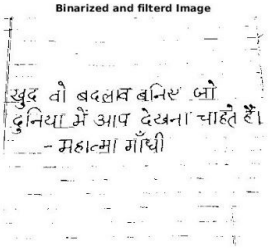


Part-2)

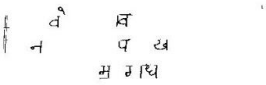
Original Image



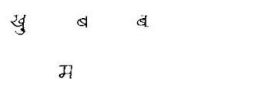
Binarized and filterd Image



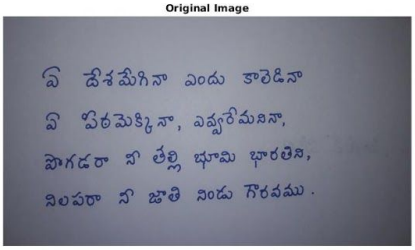
Enclosing One empty Region



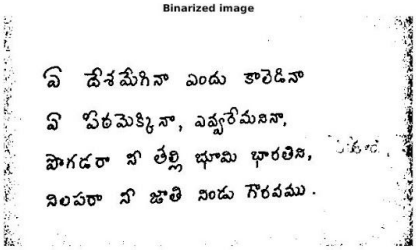
Enclosing Two empty Region



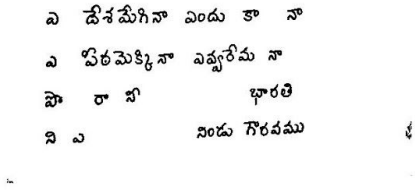
Original Image



Binarized image



Enclosing One empty Region



Enclosing Two empty Region