Marwadi University Faculty of Engineering and Technology Department of Information and Communication Technology		
Subject: DSIP (01CT1513)	**AIM: Perform gray level operations images**	
Experiment No: 07	**Date:**	**Enrolment No: 92301733046**

AIM: Perform gray level operations images.

```
import cv2
import numpy as np
# List of image filenames
image_filenames = ['ex1_1.png', 'ex1_2.png', 'ex1_3.png', 'ex1_4.png', 'ex1_5.png']
# Function to perform image negation
def image_negation(input_image):
    return 255 - input_image
# Function to perform image thresholding
def image_thresholding(input_image, threshold_value=127):
    _, thresholded_image = cv2.threshold(input_image, threshold_value, 255, cv2.THRESH_BINARY)
    return thresholded_image
# Function to perform image gamma correction
def image_gamma_correction(input_image, gamma=0.6):
    gamma_corrected = np.power(input_image / 255.0, gamma) * 255.0
    return np.uint8(gamma_corrected)
# Loop through all images and apply operations
for i, filename in enumerate(image_filenames, start=1):
    image = cv2.imread(filename, cv2.IMREAD_GRAYSCALE)
    if image is None:
        print(f"Error: Could not open or find the image {filename}")
        continue
    negated = image_negation(image)
    thresholded = image_thresholding(image)
    gamma_corrected = image_gamma_correction(image)
    # Display images
    cv2.imshow(f'Original Image {i}', image)
```

```
    cv2.imshow(f'Negated Image {i}', negated)
    cv2.imshow(f'Thresholded Image {i}', thresholded)
    cv2.imshow(f'Gamma Corrected Image {i}', gamma_corrected)

cv2.waitKey(0)
cv2.destroyAllWindows()
```

Output:

Original Image:

Negated Image:

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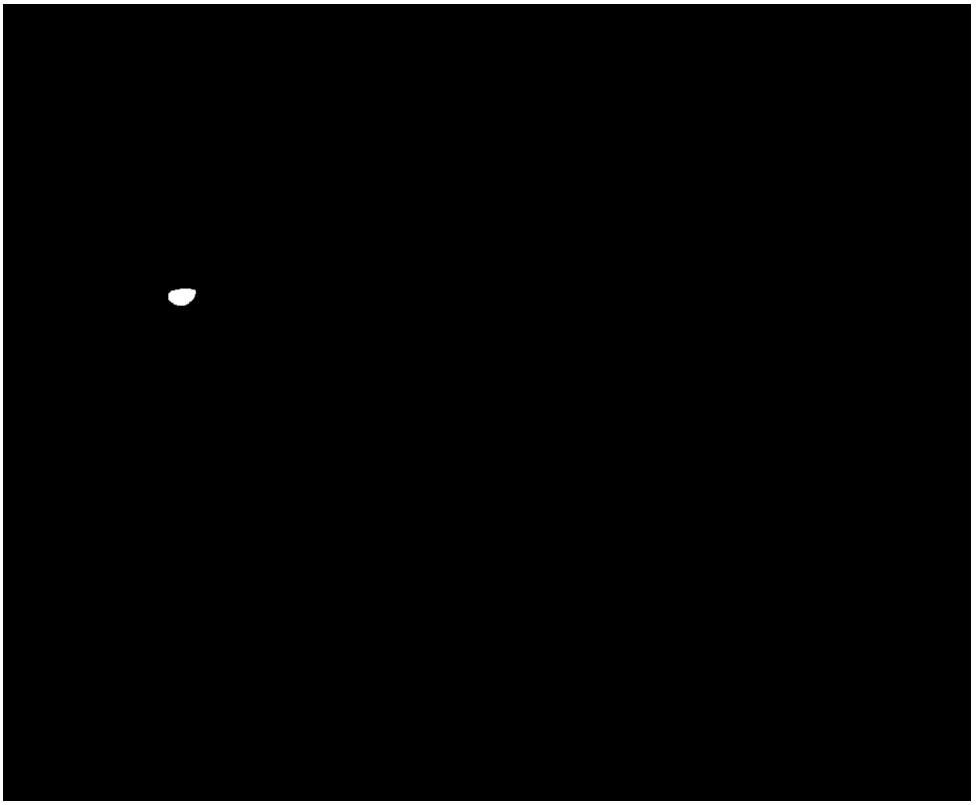

Thresholded Image:

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Gamma Corrected Image:

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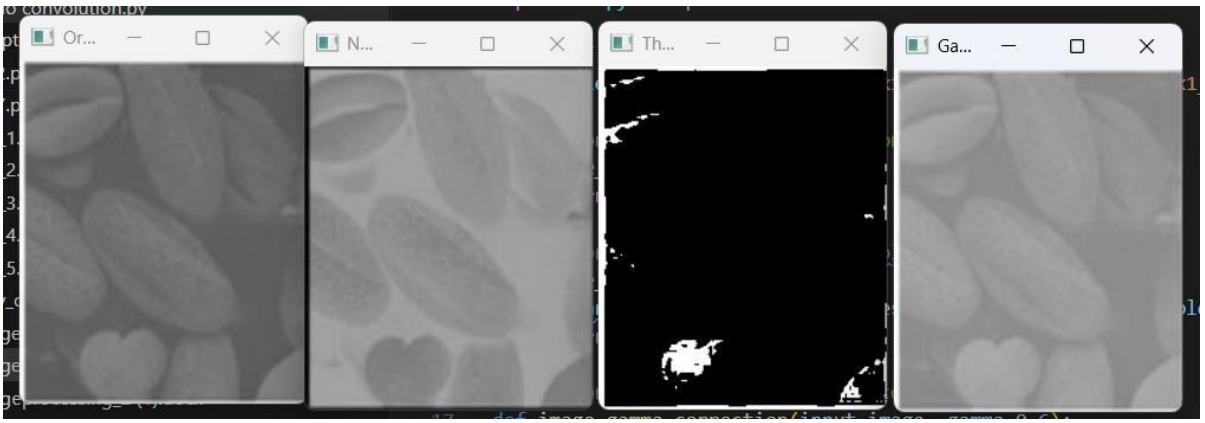
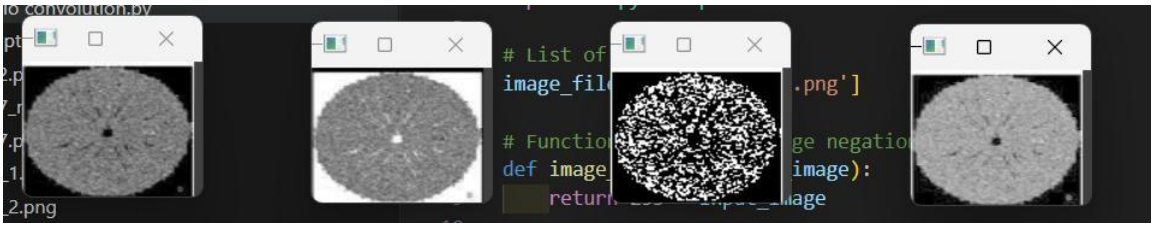
Same for remaining 4 photos:

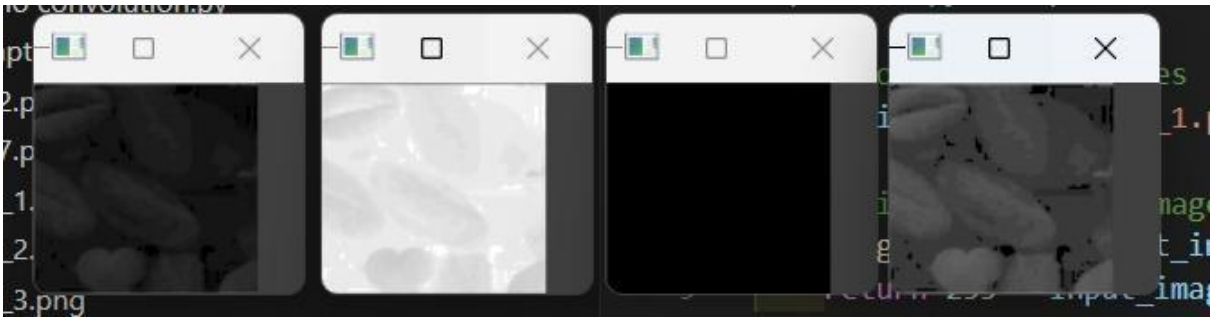
For first photo:



For second Photo:



For third image:



For fifth photo:

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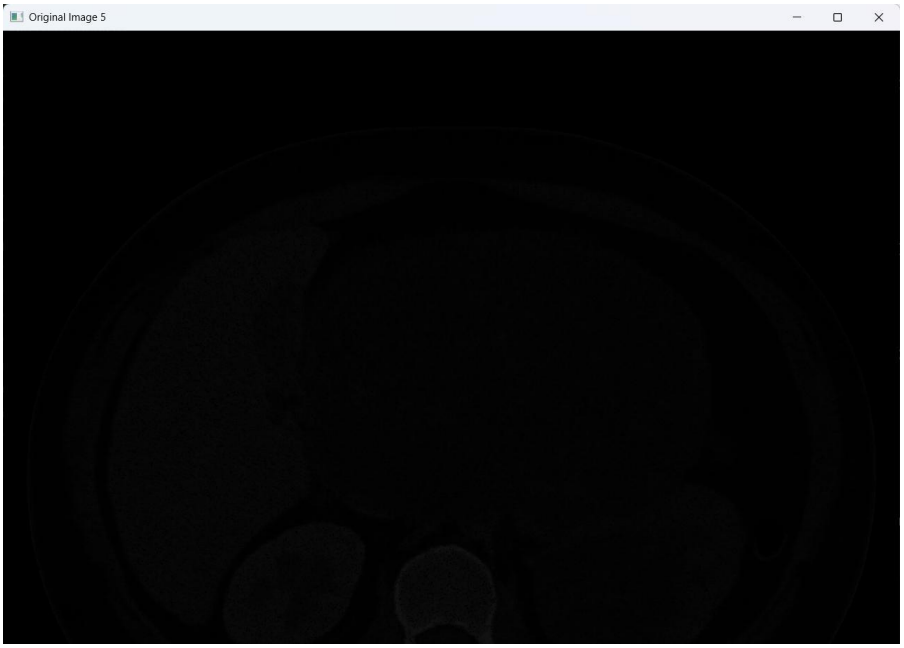

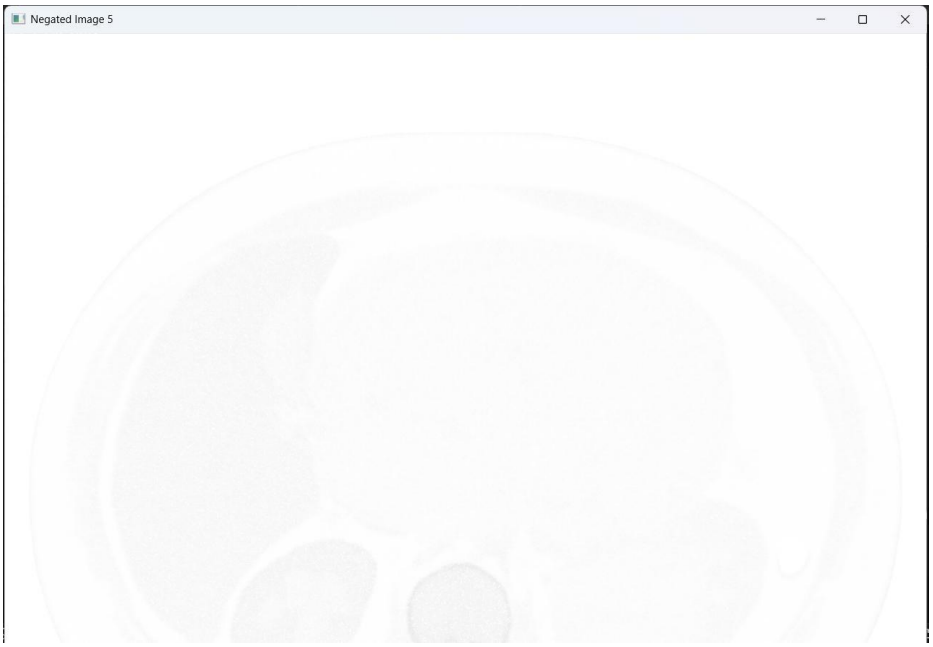

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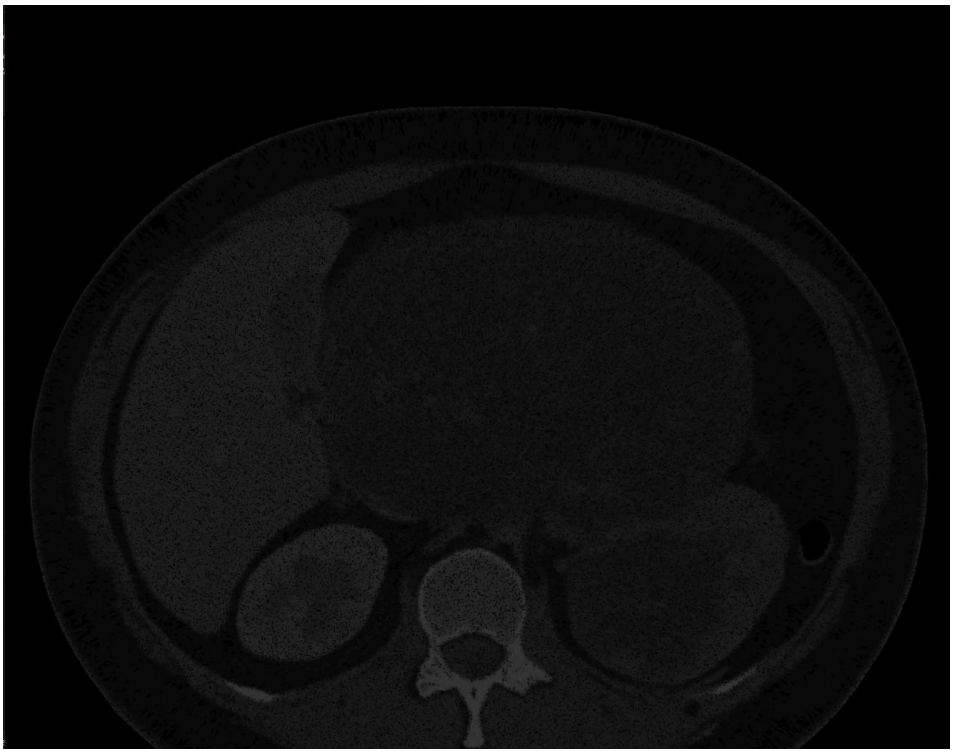

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Conclusion:

Gray level operations are simple ways to make images look better and easier to understand. They work by changing how bright or dark parts of an image are, or by adjusting the contrast. This helps important details stand out more clearly.

For example, in things like medical X-rays, satellite images, or even regular photos, these techniques can highlight the parts that matter most. Depending on what you're looking for in the image, you can choose different methods to bring out the right features.

Because they’re easy to use and very effective, gray level operations are a basic but powerful tool in image processing.