	Marwadi University
	Faculty of Technology
	Department of Information and Communication Technology
Subject: Digital Signal and Image Processing(01CT0513)	**Aim:** Perform Gray Level Operations Images.
Experiment No: 07	**Date:** **Enrollment No: 92200133030**

Aim: Perform Gray Level Operations Images.

Theory:-

- Gray-level operations involve manipulating the pixel values of an image to enhance or modify its appearance. These operations are commonly used in image processing tasks such as contrast adjustment, brightness correction, and image thresholding.

Programm:-

```python
import cv2

def perform_gray_level_operation(image, operation):
    gray_image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

    if operation == 'contrast':
        contrast_image = cv2.equalizeHist(gray_image)
        processed_image = cv2.cvtColor(contrast_image, cv2.COLOR_GRAY2BGR)
    elif operation == 'brightness':
        alpha = 1.5  # brightness factor
        processed_image = cv2.convertScaleAbs(gray_image, alpha=alpha)
        processed_image = cv2.cvtColor(processed_image, cv2.COLOR_GRAY2BGR)
    elif operation == 'thresholding':
        _, threshold_image = cv2.threshold(gray_image, 127, 255, cv2.THRESH_BINARY)
        processed_image = cv2.cvtColor(threshold_image, cv2.COLOR_GRAY2BGR)
    else:
        print("Invalid operation. Available operations: 'contrast', 'brightness', 'thresholding'")
        return None

    return processed_image

# Load the input image
image_path = './Images.jpg'
input_image = cv2.imread(image_path)

# Perform gray level operation
operation_type = 'contrast'  # Change this to the desired operation: 'contrast', 'brightness', 'thresholding'
output_image = perform_gray_level_operation(input_image, operation_type)

if output_image is not None:
    # Display the processed image
    cv2.imshow('Processed Image', output_image)
    cv2.waitKey(0)

    # Save the processed image (optional)
    output_path = 'output_image.jpg'
    cv2.imwrite(output_path, output_image)
    print(f"Processed image saved at: {output_path}")
```

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Output:-

Original Image	Processed Image

Conclusion :-

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