Marwadi University	**Marwari 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: 92301733054**

Aim: Perform Gray Level Operations Images.

Programm:-

```
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 :- In this experiment, we learned how to perform basic gray level operations such as contrast enhancement, brightness adjustment, and thresholding using OpenCV. These operations help in improving the visual quality and extracting important features from grayscale images.