INT3404E 20 - Image Processing: Homeworks 2

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1 Function flip_image

Code:

```
def flip_image(image):
    """
    Flip an image horizontally using OpenCV
    """
    return cv2.flip(image, 1)
```

Result:

2 Function rotate_image

Code:

```
def rotate_image(image, angle):
"""
Rotate an image using OpenCV. The angle is in degrees
"""
num_rows, num_cols = image.shape[:2]
rotation_matrix = cv2.getRotationMatrix2D((num_cols / 2, num_rows / 2), angle, 1)
return cv2.warpAffine(image, rotation_matrix, (num_cols, num_rows))
```

Result:

3 Function grayscale_image

Code:

```
def grayscale_image(image):
    img_gray = np.zeros(image.shape[:-1], dtype=np.uint8)
    weights = np.array([0.299, 0.587, 0.114])
    for i in range(image.shape[0]):
        for j in range(image.shape[1]):
            img_gray[i, j] = np.dot(image[i, j], weights)
    return img_gray
```

Result: