INT3404E 20 - Image Processing: Homeworks 1
Tran Thi Van Anh

1 Function grayscale_image

```python
def grayscale_image(image):
    R = image[:, :, 0]
    G = image[:, :, 1]
    B = image[:, :, 2]
    img_gray = 0.299 * R + 0.587 * G + 0.114 * B
    return img_gray
```

Grayscale Image

Figure 1: Result of function

2   Function flip_image

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


Figure 2: Result of function

3　Function rotate_image

```python
def rotate_image(image, angle):
    """
    Rotate an image using OpenCV. The angle is in degrees
    """
    center = tuple(np.array(image.shape[1::-1]) / 2)
    rot_mat = cv2.getRotationMatrix2D(center, angle, 1.0)
    rotated = cv2.warpAffine(image, rot_mat, image.shape[1::-1], flags=cv2.INTER_LINEAR)
    return rotated
```


Figure 3: Result of the rotated image 45 degree