INT3404E 20 - Image Processing: Homeworks 1
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Function: Flip an image horizontally

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

I use the function flip of *cv2* library, and set the flip code to 1 as to flip horizontally. Here is the result:

Function: Rotate the image with defined angle

```python
def rotate_image(image, angle):
    """
    Rotate an image using OpenCV. The angle is in degrees
    """
    (width, height) = image.shape[1::-1]
    image_center = (width/2, height/2)

    rotate_matrix = cv2.getRotationMatrix2D(center=image_center, angle=angle, scale=1)
    result = cv2.warpAffine(src=image, M=rotate_matrix, dsize=(width, height))
    return result
```

I use a Rotation matrix of *cv2* library with the parameters *center* (coordinates of the center), *angle* and *scale*. I set the *angle* parameter 90, and here is the result:

Function: Convert the image to grayscale

```python
def grayscale_image(image):
    """
    Convert an image to grayscale.
    """
    return cv2.cvtColor(image, cv2.COLOR_RGB2GRAY)
```

I use the function *cvtColor* of *cv2* library, and here is the result: