Computer Vision HW 1

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Description

Part 1.

1. Upside_down images

How to implement : 根據Row的一半取ceil作為圖片一半的位置，做上下交換

```
def upside_dowm(original_img, r_size, c_size):
    copy_img = copy.deepcopy(original_img)
    for i in range (int(r_size/2)):
        for j in range (c_size):
            tmp_img = copy_img[i][j]
            copy_img[i][j] = copy_img[r_size-1-i][j]
            copy_img[r_size-1-i][j] = tmp_img
```

Figure 1: upside_down images.

2. Right_side_left images

How to implement : 根據Column的一半取ceil作為圖片一半的位置，做左右交換

```
def rightside_left(original_img, r_size, c_size):
    copy_img = copy.deepcopy(original_img)
    for i in range ((r_size)):
        for j in range (int(c_size/2)):
            tmp_img = copy_img[i][j]
            copy_img[i][j] = copy_img[i][c_size-1-j]
            copy_img[i][c_size-1-j] = tmp_img
```

Figure 2: right_side_left images.

3. Diagonally_flip images

How to implement : 根據"副斜對角線"做對稱軸，做交換

```
def diagonally_flip(original_img, r_size, c_size):
    copy_img = copy.deepcopy(original_img)
    for i in range (r_size):
        for j in range (c_size-i):
            tmp_img = copy_img[i][j]
            copy_img[i][j] = copy_img[c_size-1-j][r_size-1-i]
            copy_img[c_size-1-j][r_size-1-i] = tmp_img
```

Figure 3: diagonally_flip images.

Part 2.

4. Rotated images

How to implement : 透過import pillow套件，且透過rotate function將圖片旋轉 45度

```
def rotate(original_img, degree):
    copy_img = copy.deepcopy(original_img)
    result = copy_img.rotate(degree)

    return  result
```

Figure 4: rotate images.

5. Shrink images

How to implement : 透過import pillow套件，且透過resize function將圖片解析度壓縮一半

```
def shrink(original_img, r_size, c_size):
    copy_img = copy.deepcopy(original_img)
    result = copy_img.resize( (int(r_size/2), int(c_size/2)) )

    return  result
```

Figure 5: shrink images.

6. Binarize images

How to implement : 透過for迴圈將圖片遍歷，對每個位置做判斷，如果intensity > 128就設為255，intensity <= 128就設為0

```
def binarize(original_img, r_size, c_size):
    copy_img = copy.deepcopy(original_img)
    for i in range (r_size):
        for j in range(c_size):
            copy_img[i][j] = 255 if(copy_img[i][j] > 128) else 0
```

Figure 6: binarize_img.