

CV HW1 Report

林義聖
B03902048

1 Programming



Figure 1: original lena picture

I use *Python* as my programming language and *Pillow* as my Image Library. At first, I read the image in, then load pixel data of the image into Python *list* by calling this function,

```
pixel_data = list(img.getdata())
```

1. Upside-down the image. The source code of this part is ***upside-down.py***.

```
for y in range(height):  
    for x in range(width):  
        result_data[y*width+x] = pixel_data[(height-y-1)*width+x]
```



Figure 2: upside-down lena picture

2. Right-side-left the image. The source code of this part is *right-side-left.py*.

```
for y in range(height):
    for x in range(width):
        result_data[y*width+x] = pixel_data[y*width+(width-x-1)]
```



Figure 3: right-side-left lena picture

3. Diagonal mirror the image. The source code of this part is *diagonal-mirror.py*.

```
for y in range(height):
    for x in range(width):
        result_data[y*width+x] = pixel_data[x*width+y]
```



Figure 4: diagonal-mirrored lena picture

2 Image Processing Software

I use GIMP to manipulate lena.bmp image.

1. rotate 45 degrees clockwise
Use rotate tool to rotate image in 45 degrees.



Figure 5: rotated lena picture

2. shrink in half
Use scale tool to scale image from 512×512 to 256×256 .

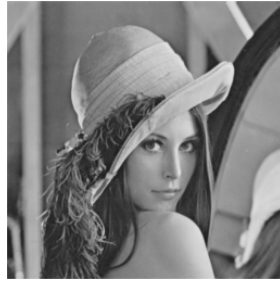


Figure 6: half-shrunked lena picture

3. binarize at 128

Use color tool and set up the threshold at 128 to binarized image.



Figure 7: binarized lena picture

3 How to Use

For running the three small program (*upside-down.py*, *right-side-left.py*, *diagonal-mirror.py*), you need to specify two parameters. The 1st is the input image name, and the 2nd is the output image name.

```
> python upside-down.py lena.bmp output.jpg
```