電腦視覺 Homework 1 – Basic Image Manipulation

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Original lena.bmp

Part1: Write a program to do the following requirement

(a) Upside-down lena.bmp

```
def UpsideDown(image,w,h):
    for x in range(w):
        for y in range(h//2):
            upper = image.getpixel((x,y))
            lower = image.getpixel((x,h-1-y))
            image.putpixel((x,h-1-y),upper)
            image.putpixel((x,y),lower)
    return image
```

(b) Right-side-left lena.bmp

```
def RightSideLeft(image,w,h):
    for y in range(h):
        for x in range(w//2):
            left = image.getpixel((x,y))
            right = image.getpixel((w-1-x,y))
            image.putpixel((w-1-x,y),left)
            image.putpixel((x,y),right)
    return image
```

(c) diagonally mirrored lena.bmp

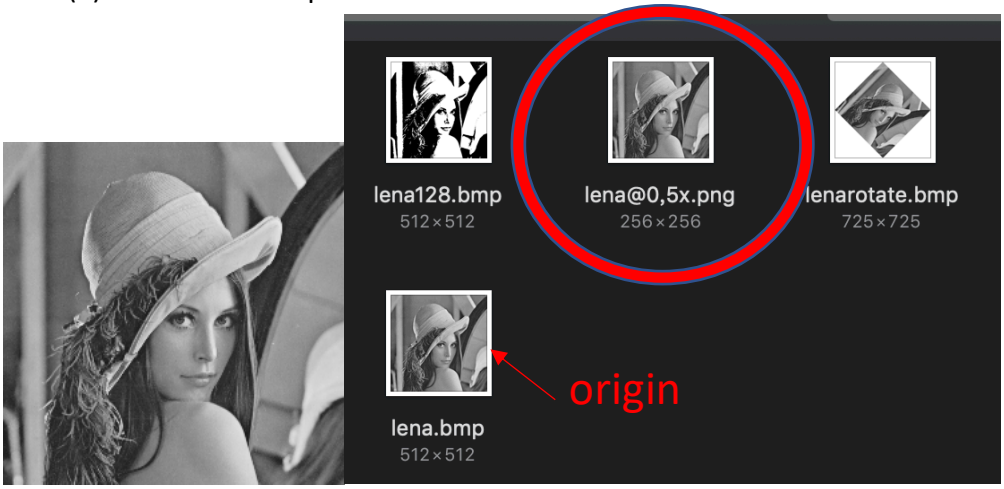
```python
def Diagonally(image,w,h):
    for y in range(h):
        for x in range(w):
            if(x<y):
                leftdown = image.getpixel((x,y))
                rightup = image.getpixel((y,x))
                image.putpixel((y,x),leftdown)
                image.putpixel((x,y),rightup)
    return image
```

Part2:Write a program or use software to do the following requirement

(Done with photoshop)

(d) rotate lena.bmp 45 degree clockwise

(e) shrink lena.bmp in half



(f) Binarize lena.bmp at 128 to get a binary image