

# Computer Vision HW1

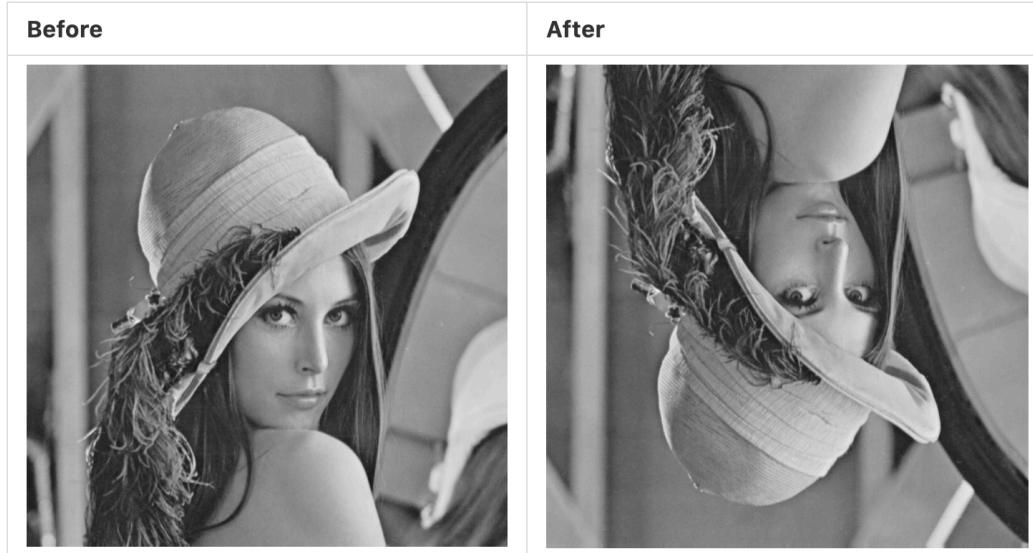
R09922093 楊子萱

## Part 1

In this homework, I use python3 and import cv2 to read and write images. To run my code, use command line and enter python3 hw1.py.

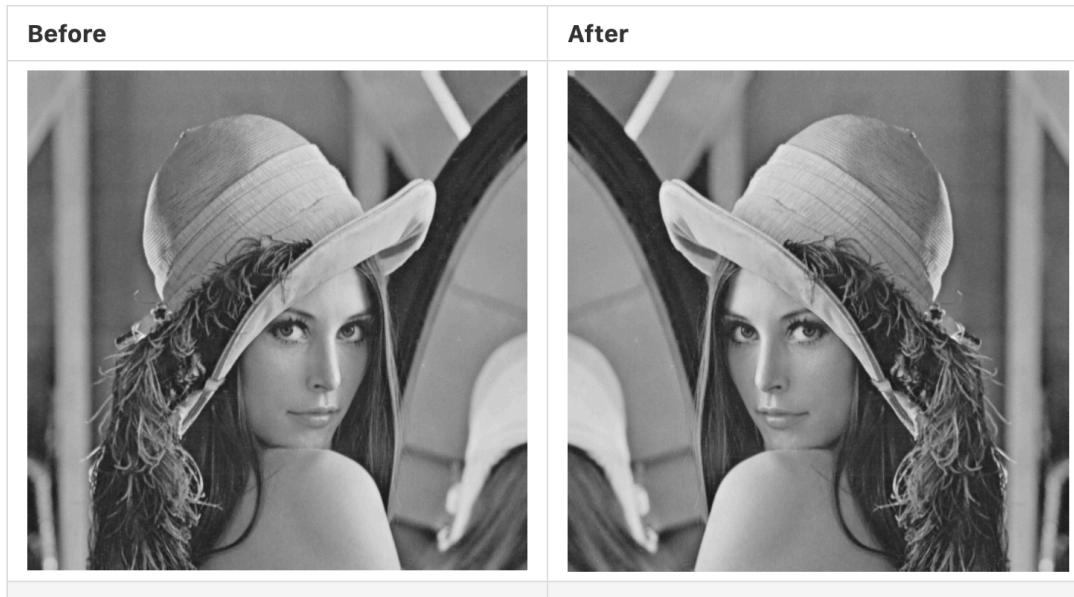
(a) upside down

```
def upsidedown(image):
    lena = image.copy()
    for i in range(lena.shape[0]//2):
        for j in range(lena.shape[1]):
            a = lena[i,j].copy()
            lena[i, j] = lena[lena.shape[0] - i - 1, j]
            lena[lena.shape[0] - i - 1, j] = a
    cv2.imwrite("upside-down lena.bmp",lena)
```



(b) right-side-left

```
def rightsideleft(image):
    lena = image.copy()
    for i in range(lena.shape[0]):
        for j in range(lena.shape[1]//2):
            a = lena[i,j].copy()
            lena[i, j] = lena[i, lena.shape[1] - j - 1]
            lena[i, lena.shape[1] - j - 1] = a
    cv2.imwrite("right-side-left lena.bmp",lena)
```



(c) diagonally flip

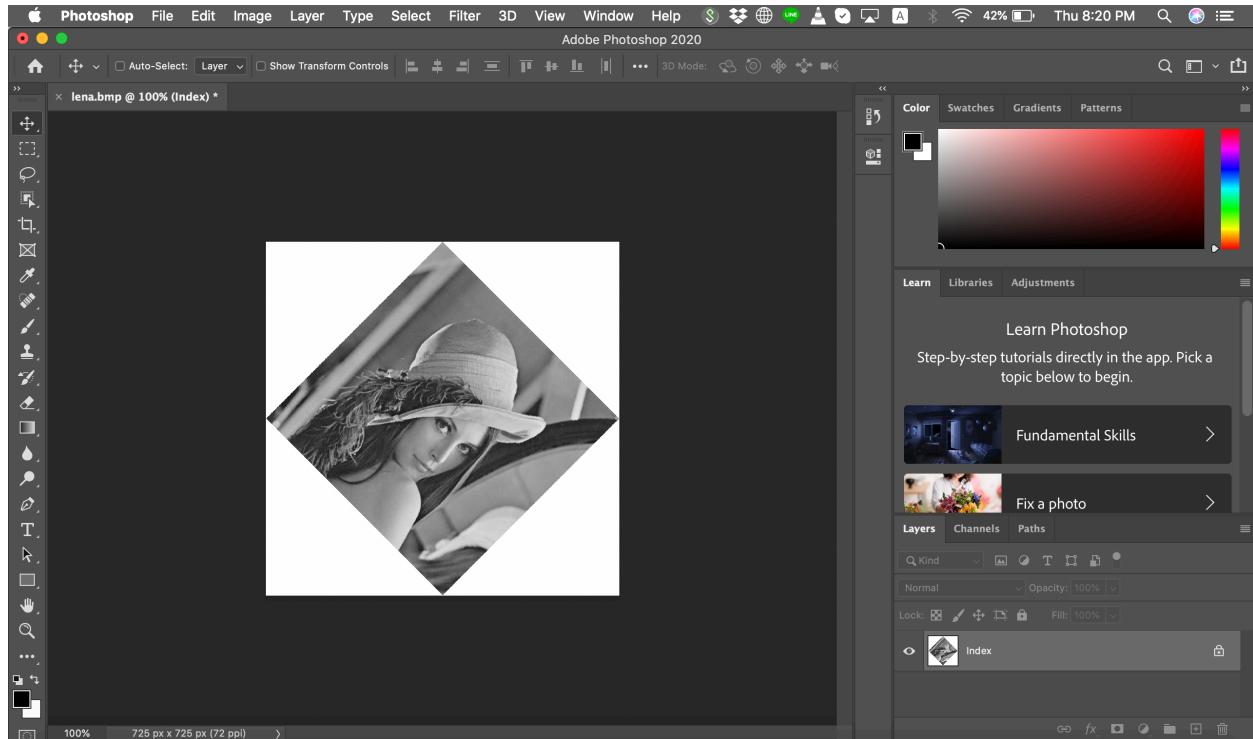
```
def diagonallyflip(image):
    lena = image.copy()
    for i in range(lena.shape[0]):
        for j in range(i):
            a = lena[i,j].copy()
            lena[i, j] = lena[j,i]
            lena[j,i] = a
    cv2.imwrite("diagonally flip lena.bmp",lena)
```



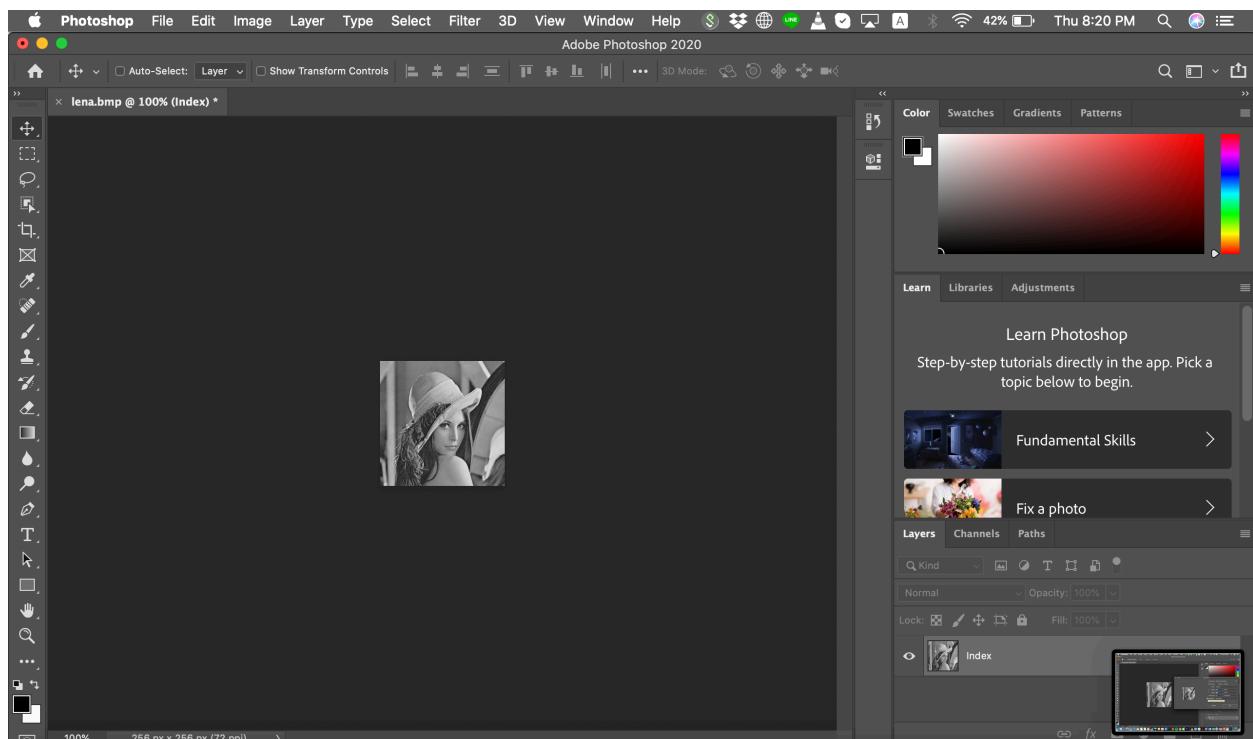
## Part 2

I use photoshop to do the following tasks.

(d) rotate lena.bmp 45 degrees clockwise



(e) shrink lena.bmp in half



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

