Computer Vision HW1

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Part 1.

Write program to generate

(a) Upside-down lena.bmp

(b) Right-side-left lena.bmp

(c) Diagonally mirrored lena.bmp

在第一部分，我採用 python3 來實作，python3 中提供的 pillow 套件，可以方便的讓我們執行圖片檔的 file I/O，同時也新增了三張新的 bmp 檔，當作 result 輸出的檔案。

```
1  from PIL import Image
2
3  im = Image.open('lena.bmp')
4  pixels = im.load()
5
6  im_u_d = Image.new('L', (im.size[0],im.size[1]), 'white')#upside-down
7  im_r_l = Image.new('L', (im.size[0],im.size[1]), 'white')#sight-side-left
8  im_d_m = Image.new('L', (im.size[0],im.size[1]), 'white')#diagonally mirrored
```

下面部分是整個程式演算法的核心，用雙重迴圈對每一個 pixel 掃過一遍，同時將這些 pixel 輸出至相對應圖片的 pixel 上。

```
10 for i in range(int(im.size[0])) :
11     for j in range(int(im.size[1])) :
12         im_u_d.putpixel((i,j), pixels[i , im.size[1]-j-1] )
13         im_r_l.putpixel((i,j), pixels[im.size[0]-i-1 , j] )
14         im_d_m.putpixel((i,j), pixels[j,i])
15
16 im_u_d.save('lena_u_d.bmp')
17 im_r_l.save('lena_r_l.bmp')
18 im_d_m.save('lena_d_m.bmp')
```

Result :

(a)Upside-down

(b)Right-side-left

(c)Diagonally mirrored

Part 2.

Use Photoshop to

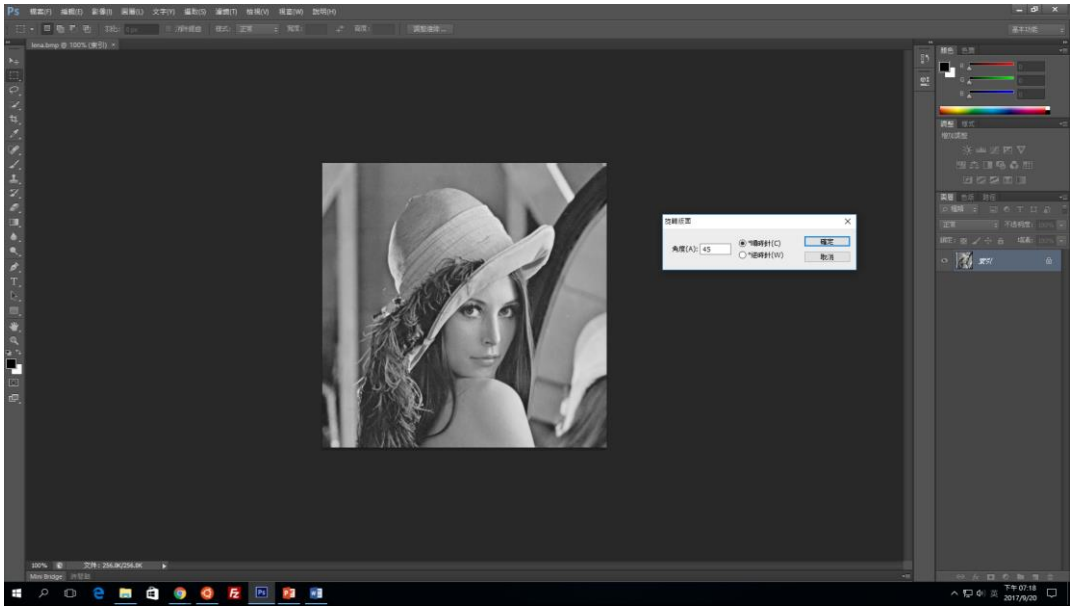
(a) rotate lena.im 45 degrees clockwise

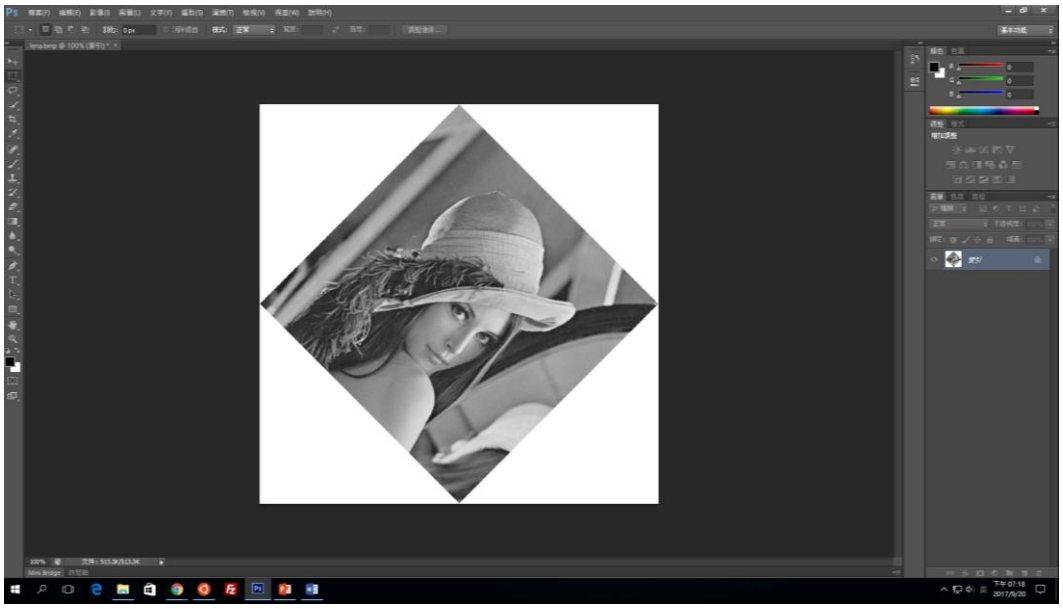
(b) shrink lena.im in half

(c) binarize lena.im at 128 to get a binary image

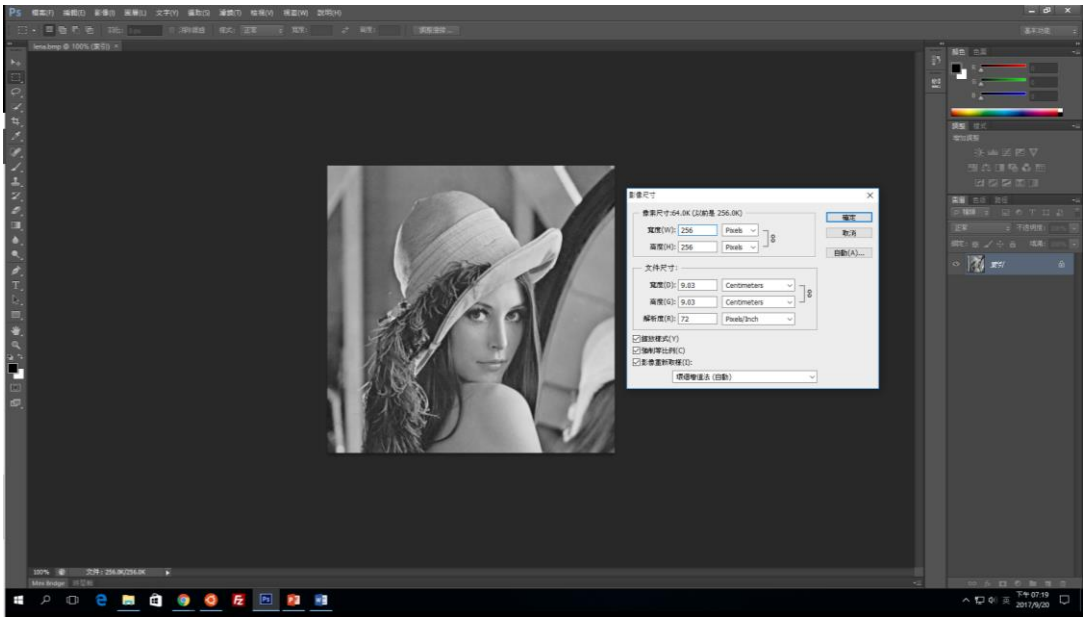
使用 Adobe Photoshop CS6 來實作我的 part2

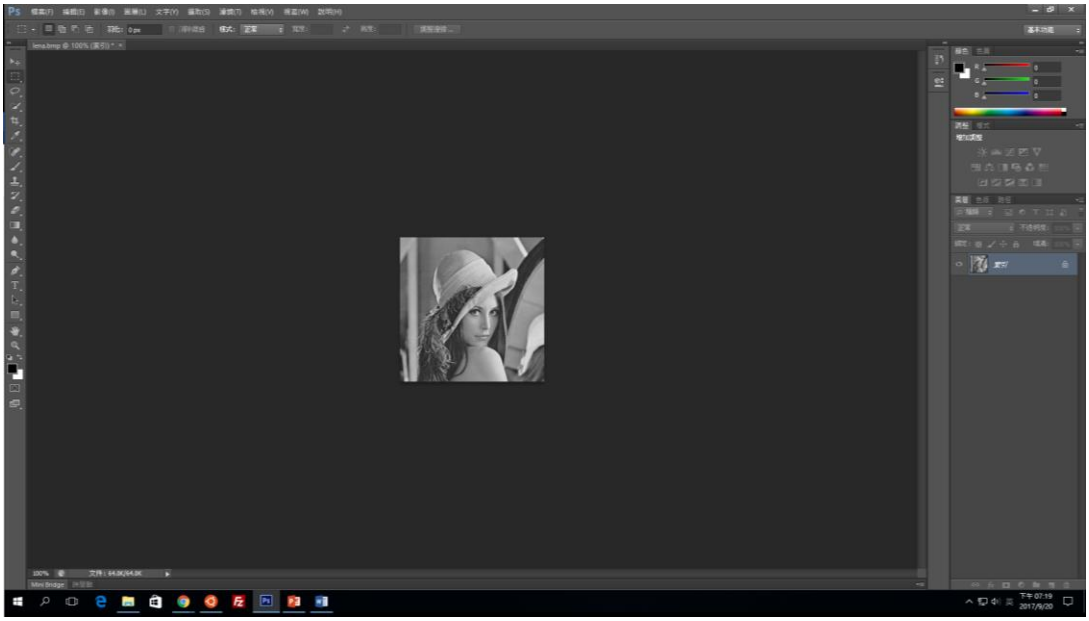
(a) rotate lena.im 45 degrees clockwise





(b) shrink lena.im in half





(c) binarize lena.im at 128 to get a binary image