Computer Vision Homework 1 Report B06507002 材料二 林柏勳

B06507002_HW1_ver1.zip contains

1. HW1_B06507002.pdf
2. HW1_B06507002.py
3. lena.bmp
4. upside_down.bmp
5. right_side_left.bmp
6. diagonally_mirrored.bmp
7. 45degree_rotation.bmp
8. shrink.bmp
9. binary.bmp

where 1 is the report, 2 is my code for Part1, 3 is the origin image, 4~6 are the output image for Part1, and 7~9 are the output for Part2.

Original lena.

lena.bmp

Part1. Write a program to do the following requirement.

I use python to process the image "lena.bmp".

One can execute Part 1 by putting "lena.bmp" and "HW1_B06507002.py" in the same folder and running "HW1_B06507002.py". Then, three image data : "right_side_left.bmp", "upside_down.bmp", "diagonally_mirrored.bmp" can be dumped in the same folder.

In my program, I import cv2 for loading image and numpy for conducting matrix calculation.

First, I got the dimension of the image by using numpy.shape, which is (h,w,c)=(512,512,3).

Then, I check if all the values in the third dimension are the same when fixing the first and the second dimension. If true, I will later dump the output in the shape of (512,512), which means it is a gray scale image. In this case, "lena.bmp is a gray scale image.

(a) upside-down lena.bmp

This part can be done by processing the first dimension of the image.

Letting newimg[i]=img[h-1-i] for i=0 to i=h-1.

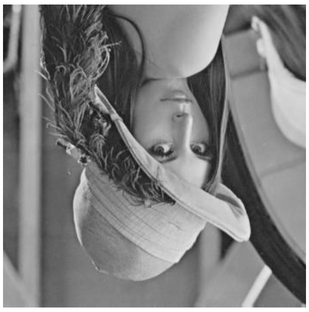
(b) right-side-left lena.bmp

This part can be done by processing the second dimension of the image.

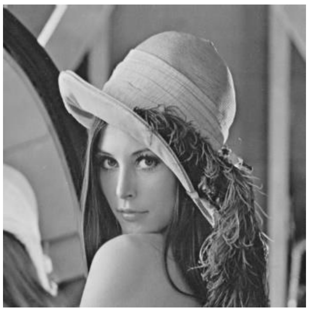
```
for i=0 to h-1:
    for j=0 to j=w-1:
        Letting newimg[i][j]=img[i][w-j-1]
```

(c) diagonally mirrored lena.bmp

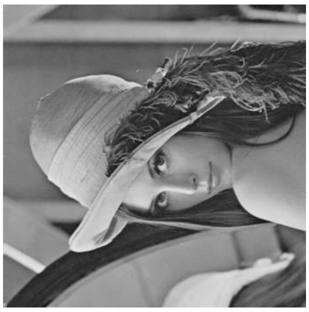
We can simply transpose the first and the second dimension to get the result by using np.transpose(img,(1,0,2)).



(a) upside_down.bmp



(b) right_side_left.bmp

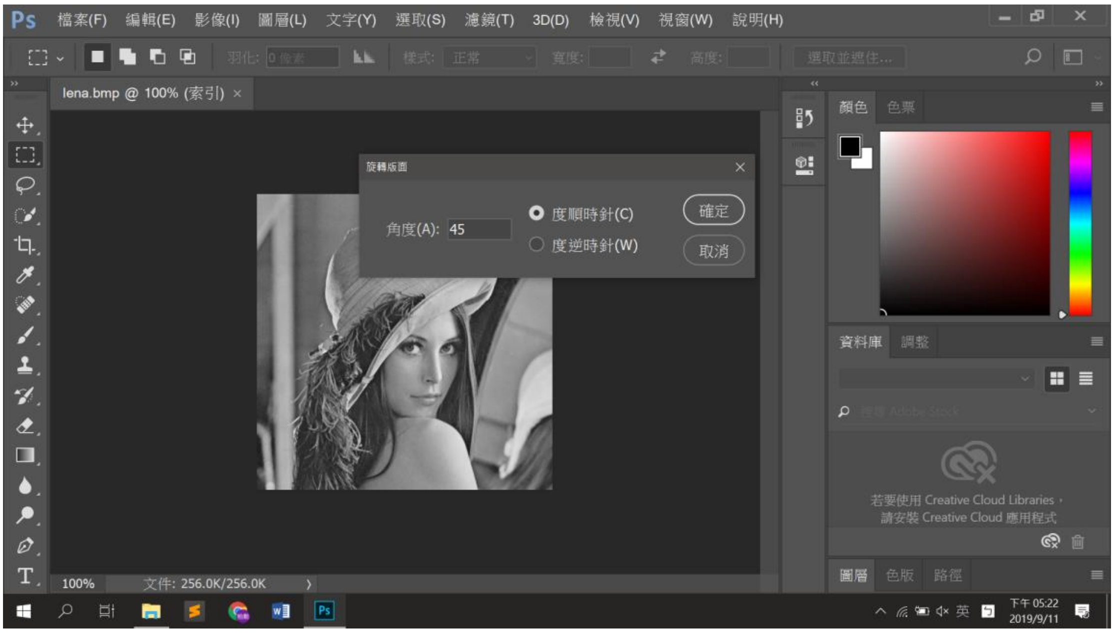


(c) diagonally_mirrored.bmp

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

I use Adobe Photoshop CC 2017 to do this part, and I provide the screenshot for (d)~(f).

(d) rotate lena.bmp 45 degrees clockwise



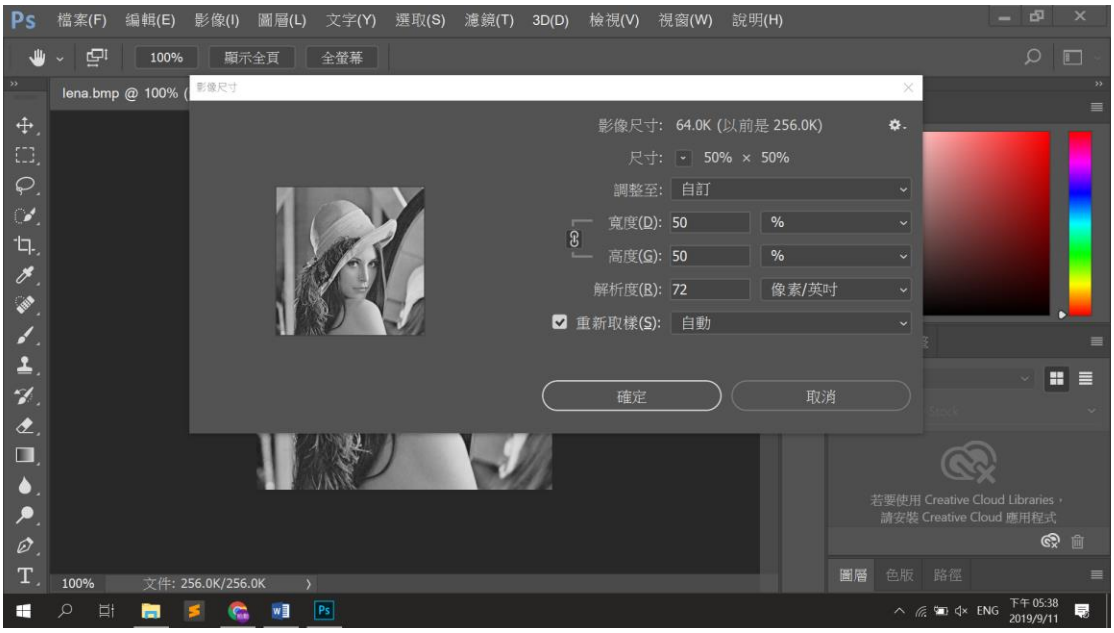
旋轉版面

角度(A): 45

● 度順時針(C)

○ 度逆時針(W)

(e) shrink lena.bmp in half



Ps
檔案(F) 編輯(E) 影像(I) 圖層(L) 文字(Y) 選取(S) 濾鏡(T) 3D(D) 檢視(V) 視窗(W) 說明(H)
100% 顯示全頁 全螢幕
lena.bmp @ 100%
影像尺寸
100% 文件: 256.0K/256.0K
若要使用 Creative Cloud Libraries，請安裝 Creative Cloud 應用程式
圖層 色版 路徑
ENG 下午 05:38 2019/9/11

影像尺寸: 64.0K (以前是 256.0K)

尺寸: 50% × 50%

調整至: 自訂

寬度(D): 50 %

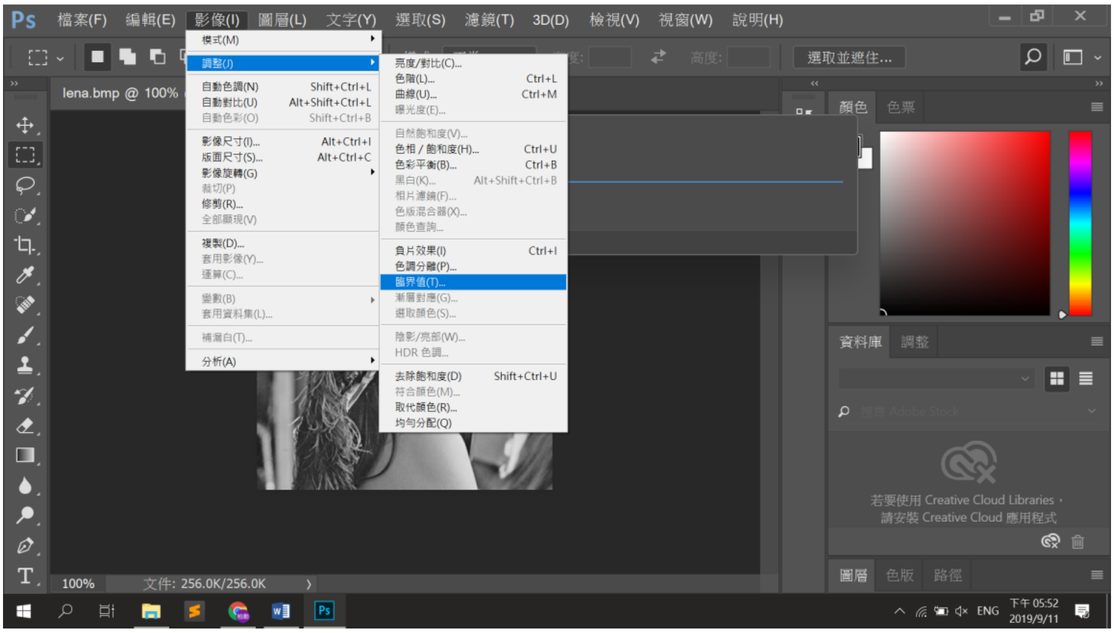
高度(G): 50 %

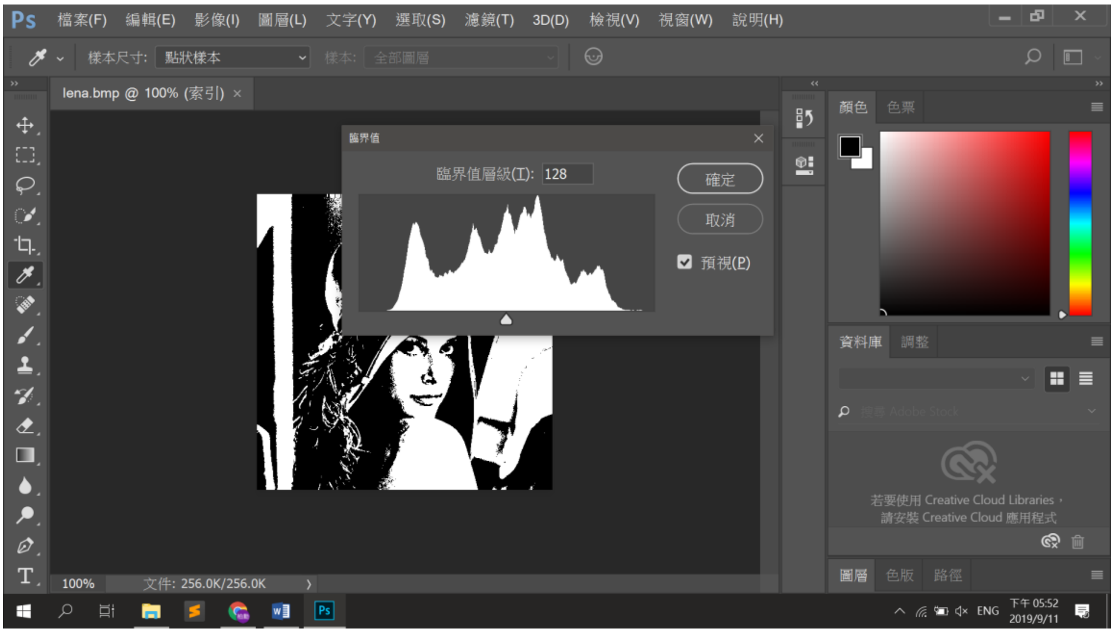
解析度(R): 72 像素/英吋

☑ 重新取樣(S): 自動

確定 取消

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





Ps
檔案(F) 編輯(E) 影像(I) 圖層(L) 文字(Y) 選取(S) 濾鏡(T) 3D(D) 檢視(V) 視窗(W) 說明(H)
樣本尺寸: 點狀樣本
樣本: 全部圖層
lena.bmp @ 100% (索引)
顏色 色票
資料庫 調整
若要使用 Creative Cloud Libraries，
請安裝 Creative Cloud 應用程式
圖層 色版 路徑
100%
文件: 256.0K/256.0K
ENG
下午 05:52
2019/9/11

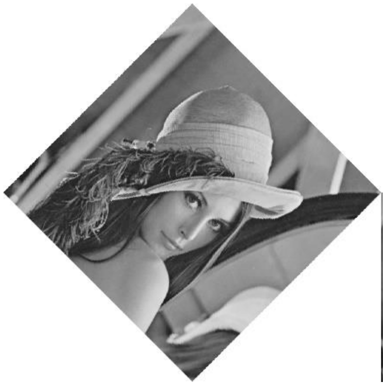
臨界值

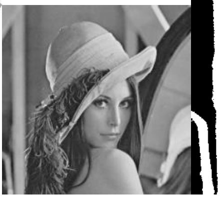
臨界值層級(T): 128

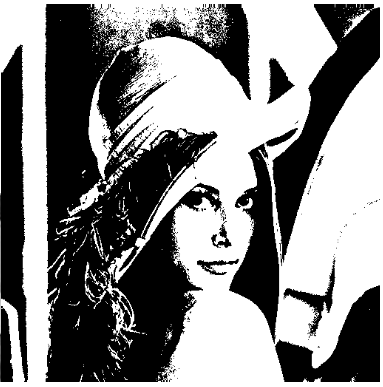
確定

取消

☑ 預視(P)







(d) 45degree_rotation.bmp (e) shrink.bmp (f) binary.bmp