

HW 1 Basic Image Manipulation

Part 1

Source code

Please refer to the file “main.cpp” within the same folder as this report document.

Results

(all the results are properly stored as *.bmp images within the same folder as well)



(a) upside_down.bmp



(b) rightside_left.bmp



(c) diagonally_mirrored.bmp

Part 2

Image processing software I used: Adobe Photoshop CC
(all the results are properly stored as *.bmp images within the same folder as well)

(a) Rotate 45 degrees clockwise

Steps that I took

Step #1: Open the photo "lena.bmp" with Adobe Photoshop CC

Step #2: Choose "影像" from the menu bar on the top

Step #3: "影像旋轉" > "任意..."

Step #4: Enter "45" (degrees) in the pop-up window and choose "順時針" (the default one)

Step #5: Save the image as "lena_rotated.bmp"

Result



(you can also see the "lena_rotated.bmp" in the same folder as this document)

(b) Shrink in half

Steps that I took

Step #1: Open the photo "lena.bmp" with Adobe Photoshop CC

Step #2: Choose "影像" from the menu bar on the top

Step #3: Choose "影像尺寸" > "調整至" > "自訂"

Step #4: Type in "256" in the text box below and make sure the unit on the right is set to "pixel"

Step #5: Save the image as "lena_shrunked.bmp"

Result

(you can also see the "lena_shrunked.bmp" in the same folder as this document)



(c) Binarize at 128 to get a binary image

Steps that I tool

Step #1: Open the photo "lena.bmp" with Adobe Photoshop CC

Step #2: Choose "影像" from the menu bar on the top

Step #3: "調整" > "臨界值"

Step #4: Type "128" into the text field in the pop-up window and hit "確定"

Step #5: Save the image as "lena_binarized.bmp"

Result



(you can also see the "lena_binarized.bmp" in the same folder as this document)