Computer Vision HW1

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Part1.

Language: Python3

Description: I use OpenCV to do image I/O, and load raw pixel data (height , length , channels) from lena.bmp.

Upside_down[x , y] correspond to lena[height-x , y]

Right_side_left[x , y] correspond to lena[x , length-y]

diagonally_mirrored[x , y] correspond to lena[height-x , length-y]

Run: python hw1.py

```
#512 , 512 , 3
x , y , channels = lena.shape

upside_down = np.zeros(lena.shape)
right_side_left = np.zeros(lena.shape)
diagonally_mirrored = np.zeros(lena.shape)


for i in range(x):
    for j in range(y):
        upside_down[i , j] = lena[x-1 - i , j]
        right_side_left[i , j] = lena[i , y-1 - j]
        diagonally_mirrored[i , j] = lena[x-1 - i , y-1 - j]
```

(a) Upside-down

(b) Right-side-left

(c) Diagonally mirrored

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