HW 1: Basic Image Manipulation

Source Code

All questions are written in Python code, please refer to the file “main.py”.
All images will be stored in the folder “res” (automatically create a new folder).
In accordance with the **FAQ** of course website:

- Part 1 does not use any library function, except Numpy (for organizing purposes).
- Part 2 uses other library functions as **there are no restrictions**.

Part 1

1. Upside Down
   Algorithm:
   1) Read from the bottom-right corner of the original image
   2) Store in a list
   3) Convert list to numpy array
   4) Reshape to original size

2. Right-side Left
   Algorithm:
   1) Read original image from the right
   2) Store in a list
   3) Convert list to numpy array
   4) Reshape to original size

3. Diagonally Flip
   Algorithm:
   1) Read original image
   2) Copy the values right-diagonal-half of the original image
   3) Paste the values onto the left-diagonal-half of the original image

Part 2

---

4. Rotate 45 degrees clockwise
   Algorithm:
   1) Use scipy.ndimage to rotate image (`ndimage.rotate(img, -45)`)
   2) Change values of 0 with 255 (black -> white)

5. Shrink image in half
   Algorithm:
   1) Use cv2.resize to resize image
      (`cv2.resize(img, (int(height/2), int(width/2)), cv2.INTER_AREA)`)
   2) Insert size of half-sized image into the function

6. Binarize image
   Algorithm: Use cv2.threshold to binarize image
   (`cv2.threshold(img, 128, 255, cv2.THRESH_BINARY)`)