第五章、第六章 练习题。所有练习题都书写交上。对编程题，写出直接相关的函数就可以，不用书写完整程序。

第五章 Image Processing Techniques

1. Which function splits a multichannel into several single-channel images?

2. Which function merges several single-channel images into a multichannel image?

3. Translate an image 150 pixels in the x direction and 300 pixels in the y direction.

4. Rotate an image named img by 30 degrees with respect to the center of the image with a scale factor of 1.

5. Build a 5 x 5 averaging kernel and apply it to an image using cv2.filter2D().

6. Add 40 to all the pixels in a grayscale image

1. 哪个函数将多通道分割成多个单通道图像?

2. 哪个函数将多个单通道图像合并成一个多通道图像?

3. 在x方向上平移150像素，在y方向上平移300像素。

4. 将名为img的图像相对于图像中心旋转30度，比例系数为1。

5. 构建一个5 x 5的平均内核，并使用cv2.filter2D()将其应用于图像。

6. 将灰度图像中的所有像素加40。

第六章 Constructing and Building Histograms

1. What is an image histogram?

2. Calculate the histogram of a grayscale image using 64 bins.

3. Add 50 to every pixel on a grayscale image (the result will look lighter) and calculate the histogram.

4. Calculate the red channel histogram of a BGR image without a mask.

5. What functions do OpenCV, NumPy, and Matplotlib provide for calculating histograms?

6. Modify the grayscale\_histogram.py script to compute the brightness of these three images (gray\_image, added\_image, and subtracted\_image). Rename the script to grayscale\_histogram\_brightness.py.

7. Modify the comparing\_hist\_equalization\_clahe.py script to show the execution time of both cv2.equalizeHist() and CLAHE. Rename it to comparing\_hist\_equalization\_clahe\_time.py.

1.什么是图像直方图?

2.用64 bins计算灰度图像的直方图。

3.将灰度图像上的每个像素加50，图像更亮，计算直方图。

4.计算没有掩码的BGR图像的红色通道直方图。

5.OpenCV、NumPy和Matplotlib提供了什么函数来计算直方图?

6.修改grayscale\_histogram.py，计算这三个图像(gray\_image、added\_image和subtracted\_image)的亮度。将脚本重命名为grayscale\_histogram\_brightness.py。()

7.修改comparing\_hist\_equalization\_clahe.py脚本，显示cv2.equalizeHist()和CLAHE的执行时间。将其重命名为comparing\_hist\_equalization\_clahe\_time.py。