

# Homework 2 - Histogram Equalization

Write a function called **histeq** which takes a grayscale image **I**, applies histogram equalization to it, and returns the resulting image. You can use numpy arrays, but cannot use built-in numpy or opencv functions for computing histograms or performing histogram equalization. You have to fill in the function body in the file **hw2.py** in your homework directory. This files compares opencv histogram equalization with the function you have written. Upload the completed file **hw2.py**.

```
import cv2
import numpy as np
from matplotlib import pyplot as plt

def histeq(I):
    """Applies histogram equalization on
    I and returns the resulting image"""
    # function body

I = cv2.imread('map.jpg', cv2.IMREAD_GRAYSCALE)

J = histeq(I)
K = cv2.equalizeHist(I)

f, axes = plt.subplots(2, 3)

axes[0,0].imshow(I, 'gray', vmin=0, vmax=255)
axes[0,0].axis('off')
axes[0,0].set_title('Original Image')

axes[1,0].hist(I.ravel(),256,[0,256]);

axes[0,1].imshow(J, 'gray', vmin=0, vmax=255)
axes[0,1].axis('off')
axes[0,1].set_title('My Hist. Eq. ')

axes[1,1].hist(J.ravel(),256,[0,256]);

axes[0,2].imshow(K, 'gray', vmin=0, vmax=255)
axes[0,2].axis('off')
axes[0,2].set_title('OpenCV Hist. Eq. ')

axes[1,2].hist(K.ravel(),256,[0,256]);

plt.show()
```