

Solution and Answers on Homework 0

PART I:

- Q: Print the shape of the Numpy array containing the image -- what do the sizes of the dimensions mean?
 - A: (240, 320, 3) -> represents the (Height in Pixels, Width in Pixels, Channels) of the image. With 3 channels representing the blue, green, and red channel of the picture.
- Q: Print the image itself -- what do these numbers mean?
 - A: It prints out 3 arrays which each have a dimension of 240x320 as mentioned before and each number in the array represents the brightness of each pixel for each channel in the picture ranging from 0 to 255 for the blue, green, and red channel. With 0 as the darkest brightness and 255 the brightest brightness

PART II:

- Q: Show the average image, what we will call the "background" image. The cars have disappeared! Why?
 - A: Because we are averaging out each pixel, as the cameras perspective is stationary the background is present in each picture, so the average for each pixel is at least the background. The cars only appear in some of the many images and therefore do not contribute much to the average value.

PART III:

- Q: How well does each technique work?
 - A: With the Otsu method the Threshold Value is automatically determined. But may not deliver the desired result because of noise or similar. With enough playing around the normal threshold method can get you a similar result.
- Q: What could be improved about the output?
 - Preprocessing: Prior image preprocessing (e.g., noise reduction, image enhancement) might improve the performance of Otsu's method by ensuring a clearer separation between foreground and background.

BONUS:

- See Python Script