PHYS 410/510 Fall 2024 Homework 1
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Puzzles 1. *(6 pts.) An exercise involving loading images, exploring some idiosyncrasies of languages and libraries. There are two different versions; just do one!*

Solution. **(a)** We first import packages then display the images side by side to make comparing them easier.

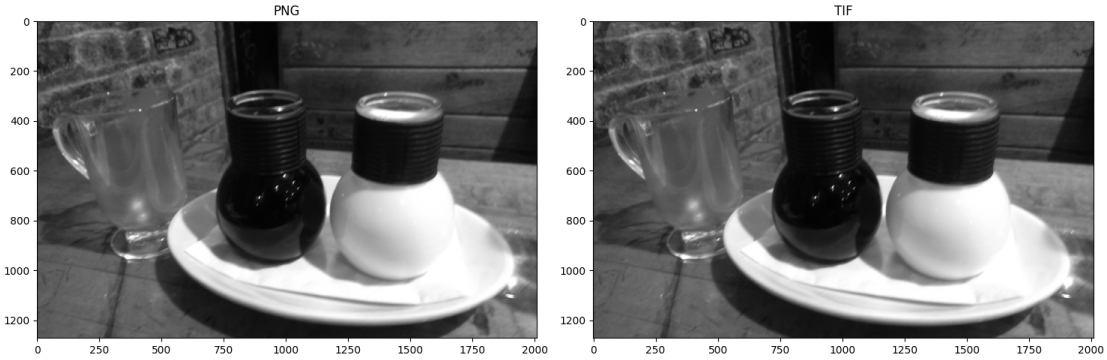

Figure 1: The PNG and TIF images side by side for comparison.

I cannot visually see any differences between the two images, so as asked, we determine the minimum and maximum values of each image using `numpy.min` and `numpy.max`: From

Image Type	Minimum	Maximum
PNG	0.01176	1.0
TIF	3	255

this we see that the types vary where for the TIF, the array has entries of type Int8 and the PNG array has entries of type Float32.

(b) Next we save the first image array (the PNG) as a TFF using the `imsave` function and also using the scikit-image package method. Figure 2 shows the output using matplotlib which has introduced a yellow/green hue to everything. Figure 3 shows that everything has been brightened up considerably, probably because all of the values as floats are somehow scaled (incorrectly) to the integer values of a TIF.

I next checked the dimensions of each of these when reloading them using `io.imread` and the shape attribute in Python and found the following. I'm assuming the additional dimension of 4 is a bit depth but I'm unsure at this point.

Library	Shape
matplotlib	(1271, 2009, 4)
scikit-image	(1271, 2009)

Figure 2: The result of outputing a PNG to a TIF using the matplotlib library.

Figure 3: The result of outputing a PNG to a TIF using the scikit-image library.