Day 1 Lab

July 20, 2019

Hints For reading/writing images, use PIL/Pillow. Pillow documentation is at `https://pillow.readthedocs.io/en/stable/reference/Image.html`. To open a PNG file and convert it into a 2D numpy matrix:

```
from PIL import Image
import numpy
img_src = Image.open(‘‘/path/to/image.png’’)
image_mat = numpy.array(img_src)
```

To save the manipulated image from a numpy array to disk:

```
imp = Image.fromarray(image_mat)
imp.save("/path.to/image_modified.png")
```

Problem 1. Read in the mars.png file provided in the group chat. Write it out as mars1.png.

Problem 2. Write a program to create a 128x128 PNG file with the diagonal being black and everything else being white. Output the image to p1.pgm.

Problem 3. Implement a program that does the gamma correction on mars.pgm. Hint: for each pixel,

$$\text{output value} = 255 \times (\text{input value}/255)^{1/2.2}$$