**Editing Images**

**CAC 180**

Below is a template for writing image manipulation code:

#Import the Image library that will allow us to access images

from PIL import Image

#Open an image from a file

img = Image.open('filename.jpg')

#Get all of the pixels (stored in a two dimensional array - matrix)

pixels = img.load()

#Loop through all of the pixels

for i in range(img.size[0]): #Loops through columns

for j in range(img.size[1]): #Loops through rows

#Get the rgb value of the pixel at (i,j)

r,g,b = img.getpixel((i,j))

#Edit the r, g, and b values in some way

. . .

#Write the new colors back to the pixel

pixels[i,j] = (r, g, b)

#Save the image in a new file

img.save('filename2.jpg')

1. If I have an image that is 400x500, how many columns do I have? How many rows?
2. What does img.size[0] get?
3. What does img.getpixel((i,j)) do? Why is it set to three different variables?
4. Why do I save the file as a different name?
5. Is the file saving in a loop? Why or why not?
6. What is the purpose of having a loop within a loop (nested loop) for editing the image?
7. I wanted to remove all of the red from this image, what would go in the . . . section of the code?
8. Let’s say I had an image made up of the following table (it’s a tiny image). Draw a table representing the image after each iteration of the outer loop (you’ll have more than one since the loop will run more than once) applying what you wrote in #7.

|  |  |  |  |
| --- | --- | --- | --- |
| (2,5,23) | (45,20,103) | (165,38,201) | (245,178,123) |
| 45,20,103) | (165,38,201) | (245,178,123) | (2,5,23) |
| (245,178,123) | (2,5,23) | 45,20,103) | (165,38,201) |

1. If I wanted to get the negative of the image, what would go in the . . . section of the code?