Homework 1

Greg Dews | CS390S | 9/4/2019

The Code

Goals:

- Read a photo and convert it to grayscale.
- Mask, or replace, background (chosen as area outside circle of specified distance)

Python “PIL” commands:

- Image.open(<file name>)
  - Command to access picture file.
  - File must be in current working directory, unless path provided.
- Image.load()
  - Creates a pixel map (3D array of pixel values).
- Image.new(<color format>, <dimension tuple>, <default color>)
  - ‘L’ for color format, specifies grayscale image.
  - Creates new image of dimension parameter of default color.
- Image.save(< new file name>)
  - Command to save image.
- Image.show()
  - Displays image using OS and temporary image file if not saved.

The Process

Loaded Nyan Cat picture (PNG) into memory and created a pixel map so I can access each element iteratively.

Created new image in grayscale, of the same size(dimensions) as Nyan Cat picture, and created pixel map of new image.

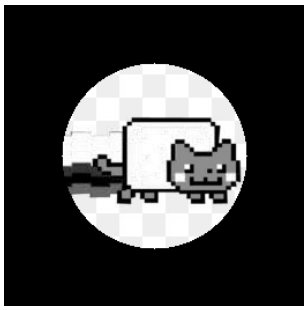
Iterated through dimensions (length, width) and checked distance from center on each iteration.

If the distance is less than or equal to 80, set the color to the Blue intensity of the Nyan Cat pixel (because I didn't want to average the values).

Otherwise, set the pixel to black.

Save the image as "NyanInFrame.BMP"

Show the image.



Some Problems

Attempted to try multiple libraries but PIL seemed to work best for what I needed to do in this project.

Averaging the BGR values provided by the Image.load() function does not provide the correct variable type in order to set the color of the grayscale image intensity. I will need to look into more pythonic solutions.

If I don't save the file before showing, it is possible for Windows to remove the temporary file before viewing. The file path is not guaranteed if I don't save.

Reflection

The most difficult part of this homework was in finding the appropriate Python library to use and learning it's API to achieve what I needed. Any projects after this point will involve much less time.

I was very tempted to have my program replace any pixels that had am Alpha value that portrayed the background to my Nyan Cat image, such that it would choose just the Nyan Cat as the foreground. This would adjust the subjective background of the picture rather than choosing only the pixels outside the circle as black pixels.