

cs171: Introduction to Programming
Programming Assignment 2

Objective

The objectives of this assignment include the following:

- Open and manipulate images.
- Become familiar with arrays of pixels.
- Use for-loops to operate on all pixels.
- Use if-statements to change the colors.

In this assignment you will be adding a method to the `Picture` class that will *posterize* an existing image. To posterize an image means to reduce the number of available colors. You still want the image to look about the same but similar colors will have to be consolidated into the same color since fewer color choices will be available. The effect can be quite aesthetically pleasing in some cases.

Here are the basic requirements which will earn 75 out of 100 points:

1. Add your code to the `Picture` class. You will submit your modified file as the final result.
2. Extract the pixels in the `Picture` into an array.
3. You will now use a loop to change each pixel in the array according to these rules:
 - If the red value is at least 200, then set red to 255.
 - Otherwise, if the red value is at least 128 but less than 200, set red to 200.
 - Otherwise set the red to 64.
 - If the blue value is at least 128, then set the blue value to 192.
 - Otherwise set the blue value to whatever new red value is.
 - If the green value is at least 192, then set the green to 192.
 - Otherwise set the green to 64.
4. Then redisplay the image so that the changes appear (hint: see the book for how to redisplay an image – it is not the `show` method).

5. Remember to follow appropriate commenting conventions.

Submit your file, `Picture.java`, in a folder that you create called `Project2` in your assignment inbox on the S drive.

For an additional 20 points (for a total of 95/100), write a second method called `rotateColors` that performs the following transformation:

- Set the new red color to the old blue color.
- Set the new blue color to the old green color.
- Set the new green color to the old red color.
- Redisplay the image.

Include this method in your `Picture` class too.

Finally for an additional 5 points, find some images and then either rotate them or posterize them. Search for images that have an aesthetically pleasing result. You may want to make a second copy of your `posterize` and actually play around with the ranges and color changes to find an interesting result. Submit your best result (both the before and after file) in your `Project2` folder in your inbox. Please name your files `before.jpg` and `after.jpg`. You can also submit a text file (called `readme`) that describes your posterization method if you happen to have changed the default rules given above. The images you submit will be posted on the class webpage!

Be sure to start early so that there is time to seek help and complete the assignment if you happen to get stuck – this is rarely possible if you wait till the last day or two. I can't wait to see your images, so enjoy!