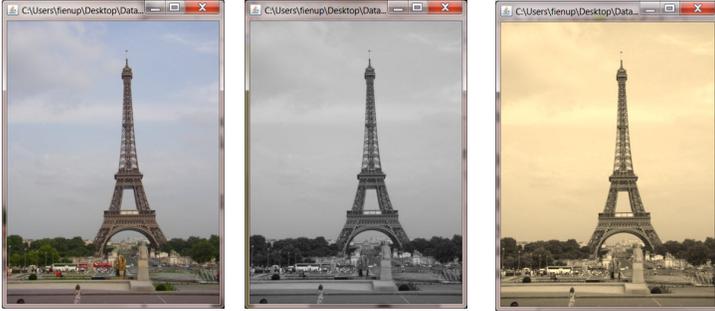


Programming Assignment #2

Due: Feb. 6 (Friday) at 11:59 PM

This week I introduced the concept of picture filters which process all the pixels of the picture the same. This assignment gives you a chance to practice creating picture filters of your own. For this assignment you are to write two separate JES filter programs:

Program 1: If you think of "old fashioned" photographs like cowboy photos from the American West of the 1800s, you probably don't actually think about grayscale photos but instead you think of sepia-toned photos. Sepia tone was a printing technique that gave photos a sort of yellowish color rather than gray. For example, here is the same photo in color, grayscale, and sepia-toned:



Using the color values recommended by Microsoft and [referenced on the wikipedia website](#) (see below) create a function called `sepiaFilter(pict)` which takes a picture as a parameter and converts that photo to sepia tone.

$$R' = (R * 0.393 + G * 0.769 + B * 0.189)$$

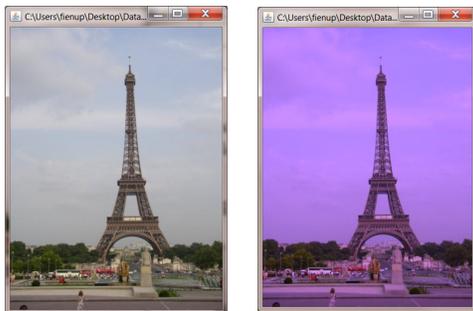
$$G' = (R * 0.349 + G * 0.686 + B * 0.168)$$

$$B' = (R * 0.272 + G * 0.534 + B * 0.131)$$

(NOTE: If you look at this closely you will see that this formula does not always produce "valid" results. That is, it

will produce RGB values greater than 255 if the original color is close to white. Since the "no wrap option" is the default, our program will not have an errors.) Name the file containing your program `sepiaFilter.py`

Program 2: UNI's President, Bill Ruud, always signs his emails "Purple for Life" (borrowing from a UNI ad campaign). For this program, I want you to write a function called `purpleForLifeFilter(pict)` which takes a picture as a parameter and tints the picture purple. You'll need to decide how to adjust the RGB values of a picture to do this, but you can use the `pickAColor()` tool to help. For example, below is the same photo in color and tinted purple. Name the file containing this program `purpleForLifeFilter.py`.



You can model both programs after the Lecture 6 `sunsetFilter.py` program:

```
""" Author: <PUT YOUR NAME HERE>
    Description: 'makeSunset' filter function described in ch 3 """
def main():
    print "Select the Media Folder"
    setMediaFolder()
    print "Select the picture (.jpg) file"
    fileName = pickAFile()
    pict = makePicture(fileName)
    show(pict)

    print "Please wait while picture is processed."
    makeSunset(pict)

    repaint(pict) # updates the picture shown

def makeSunset(pict):
    for px in getPixels(pict):
        reducedBlue = getBlue(px)*0.7
        reducedGreen = getGreen(px)*0.7
        originalRed = getRed(px)
        newColor = makeColor(originalRed, reducedGreen, reducedBlue)
        setColor(px, newColor)

main() # starts the program
```

This program is available by download `lec6.zip` at:

<http://www.cs.uni.edu/~fienup/cs1120s15/sessions/s06/>

Submit a single file containing both programs, `hw2.zip`, via the web by following the steps on the back.

The steps for the homework submission system are:

1. Design, write, debug, and test your programs in a folder called hw2. “Zip” the folder hw2 into a single file called hw2.zip (In Windows, right click on the hw2 folder and select Send to | Compressed (zipped) folder)
 2. Log on to the submission system at: https://www.cs.uni.edu/~schafer/submit/which_course.cgi
(It is very likely that you will get some security certificate warnings when trying to use this. You may add an exception and accept the existing security certificate.) Use the same CatID user-name and password you use to log on the lab computers.
 3. Select the course and section number of "CS 1120, Media Computation, Fienup". Click the "Continue".
 4. Select the homework that you wish to submit: "HW 2: Picture filter programs". Click the "Continue" button.
 5. Specify how many extra files you want to submit. Just leave it at 0. Click the "Continue" button.
 6. Upload your programs by Browsing and selecting your hw2.zip file. Click the "Continue" button.
 7. The next page reports on the status of the upload(s). You can always continue to upload a better version of the program until the deadline. The newer file will replace an older file of the same name.
- (If you miss the deadline, you’ll need to submit it as above, but select “Late Homeworks” in step 4 above.)