CS 1120: Media Computation Spring 2017
Assignment 2: Creating an Andy Warhol collage

Due: Wednesday, February 15, 2017, by 11:59 p.m.

This assignment is worth **50 points**, which accounts for **4.375%** of your final grade.

You have likely seen images of Andy Warhol's paintings. His work (known as "pop art") frequently consisted of a single image tiled multiple times onto a single canvas. Often each image was independently posterized. For example, the following is one of his more famous images consisting of four tiled images of Marilyn Monroe.

In this assignment you are to make a function that will create a Warhol like painting from any image sent in to the function.

Section 6.3 of the textbook + lab 6 part B are particularly helpful for this assignment!

Specifics
You should create a file called hw2.py

This file *must* contain a function called **generateWarhol()** that:

- Takes one string as a parameter. This string will be the name of a picture file.
- Opens that file as a picture object and gets the picture's dimensions
- Creates a new picture object using makeEmptyPicture(width,height) that is twice the width and twice the height of the original image.
- Four different times it should:
    - Open the original file (i.e., do not re-posterize the same picture!)
    - Posterize the image using four colors of your choice (See the Obama activity from your previous lab). ***The colors should be different for each iteration.***
    - Copy this newly posterized image onto one quadrant of the output canvas.

A few additional tips

You will need to manipulate two picture objects:

- source: the picture object with the original picture
- canvas: an empty picture object which is twice the width and twice the height of the original image.

Use a nested loop to iterate over all the (x, y) coordinates in the original picture. Your outer loop loops over the width, your inner loop loops over the height – so use the range() function – check lab 6 part B for implementation details.

At each step of the inner loop, use the current x, y values to get Pixel objects, like so:

```
pixel = getPixel(picture_object, x, y)
```

And here's an even more detailed description of what you do:

1. Get current pixel A from the source using your current values of x, y
2. Get the color of this pixel A
3. Get pixel B from the canvas using values calculated based on x, y
4. Set the color of pixel B to the color of pixel A.
5. Repeat steps 3 and 4 so that you copy pixel A to 4 different locations on the canvas – i.e., you are copying the picture 4 times.

Your method must **return** the completed collage. For example:

```
>>> output = generateWarhol('sergey.jpg')
>>> show(output)
```

Using any portrait. Below are a few examples of such a function using my photo:

(Aesthetically, you can do much better: I generated my colors randomly, but you will be selecting them manually)

Note that this method should work on any photo that we send in. However, we probably should limit our use of this to smaller images. The resulting image is four times that size and must posterize the original image four times. While I will test this with an image of my choice you are welcome to include with your deliverable the image that you used in

developing and testing your code.

Save your collage to a new file collage.jpg using the `writePictureTo(picture, filename)` function.

Submit your work

Submit 3 files to eLearning:

1. Your file **hw4.py**. Your file should contain the function **generateWarhol()**

2. the image you used to test your code

3. Your generated collage as a jpg file