HOMEWORK 7
CS 125
due at 12:45pm (classtime) on Thursday, September 17

Write a Python *function* to solve each of the following problems. Plan each function on paper before you implement it in code.

Prepare your solutions in a single Python file. Use comments to clearly state the problem number for each of your solutions. For problems 2, 3, and 4, provide test cases to show that your functions produce the desired output. Upload your file to the [Homework 7 assignment on Moodle](#).

1. **Grayscale images**: Write a program that converts an image to grayscale colors. To do this, iterate over all pixels in the original image. For each pixel, compute the *average* of the red, green, and blue values. Let this average be a, then assign the color (a, a, a) to that pixel.

   Note: For problem 1, it is probably easiest to test your code using an ActiveCode box in Section 8.11 of the online text. It's possible to use the image module on your computer, but this can be a bit tricky to set up.

2. **String manipulation**: Write a function `swapJoin(string1, string2)` that accepts two string parameters. Your function should return a single string containing both of the given strings, separated by a space, with their first characters swapped.

   ```
   swapJoin("abc", "xyz") returns "xbc ayz"
   ```

3. **Binary numbers:** Write a function `binaryStringToInt(b)` that accepts a binary number as a string and returns the number as an integer.

   ```
   binaryStringToInt("10110") returns 22

   binaryStringToInt("01101") returns 13
   ```

   Your function must return an integer, not a string.

4. **Formatting decimals:** Write a function `squareRoot(n)` that accepts a number as a parameter and computes the square root of the number. Your function should return a string that states the number and is square root. The square root should be formatted to three decimal places. For example:

   ```
   squareRoot(2) returns "The square root of 2 is 1.414."

   squareRoot(17) returns "The square root of 17 is 4.123."
   ```