**Project I**

**The Assignment**

Your assignment is to implement, in C/C++, two algorithms for indexed color – popularity and uniform partitioning – and compare the results on a variety of image files. These algorithms are described in Section 3.3 of *The Science of Digital Media.*

Your program should do the following:

* Reads raw RGB color images.
* Prompts the user for which of the two algorithms to run, popularity or uniform partitioning.
* Reduces the image to 256 color using the chosen algorithm.
* Creates a *.bmp* file in the appropriate indexed color format.
* Writes the *.bmp* file out to the directory from which the program is being run.

After you write your program, you should do the following:

* For each of the algorithms, run the algorithm on a variety of image files. (You'll need to turn RGB files into raw files to use as input to your program. This can be done in Photoshop.)
* Compare the results of your two algorithms. Try to characterize the image files that produce a good result (or do not get a good result) using each of the algorithms. Explain why they do or do not produce a good result.
* Using the same image files that you processed with your own program, create indexed color files using Photoshop. Compare your results to those done in Photoshop.
* Please use file names that make clear what each file contains.
* Write a document in which you explain how you implemented your algorithms and analyze your results. I would expect you would need at least two double-spaced pages for your writeup. Submit your writeup as a *.docx* or *.pdf* file. It would be good to put screenshots into your writeup. Please make your writeup clear and complete. (No sloppy work!)