Image Histogram

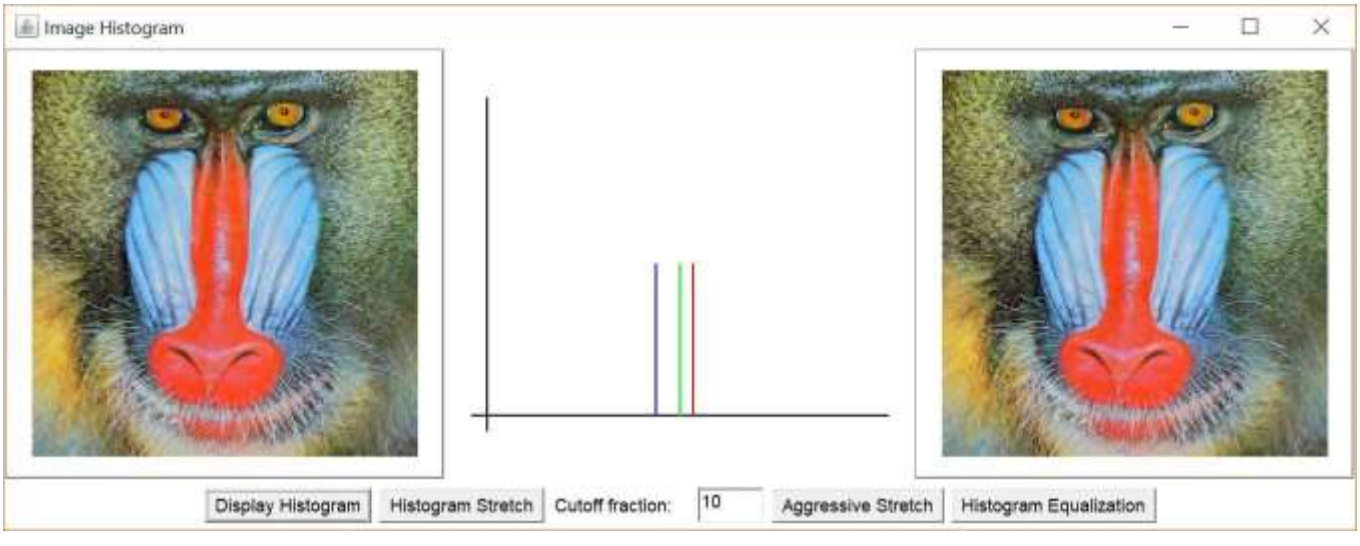
COMP 3301 — Assignment 1 Due: February 1, 2019 (Friday) 11:30 PM

Objectives:

In this assignment you will compute the histogram for an input image and implement algorithms for histogram stretch and histogram equalization. The goal is to let you practice with basic image handling functions in Java and give you a further understanding of histogram-based operations.

Your Task:

Your task is to compute the intensity histogram for each color channel of a given input image. Plot the histogram curves on the coordinate with proper scaling. Also implement three histogram-based operations: histogram stretch, aggressive histogram stretch, and histogram equalization on the input image and show the results. When processing color images, you should apply the above operations on the three color channels independently.



Output of the skeletal program

Getting Started:

A skeletal program is supplied to get you started, which you are required to use as the basis of your solution. To run the program, put the test image in the same folder. The program opens a window that contains three panels, displays the test image in two of the panels, and plots a coordinate in the middle panel. As a demo, the program also computes the average image color and plots its location when the "Display Histogram" button is pressed.

Grading:

Your program will be tested and graded using a standard Java environment. The grade will be based on your program's functionality (whether or not it works under different settings), as well as the efficiency of your implementation. The weights for different components are as follows:

- Plot histogram for each of the three color channels (20%)

- Result of histogram stretch operation (20%)
- Result of aggressive histogram stretch operation (20%)
- Result of histogram equalization operation (40%)

What and How to Hand in:

You are handing in the source of your program, as well as any data files required for running your program. Your source code must contain sufficient internal documentation to facilitate grading. This includes your names, student numbers, a brief description of what the program does, and a listing of known bugs, if any, at the top of the file. Send in your source program through the Direct2Learn dropbox as a single .zip file. No late submission is allowed.