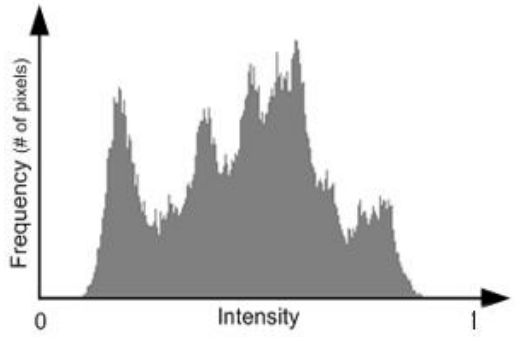
Ain Shams University
Faculty of Computer and Information Sciences
Data Structures Project

Title	Image Editing Tool
Description	The idea of this project is to develop an image editing tool that is able to load an image and apply some image functions according to user selection and then saves the results. The application should begin by loading an image, then asking the user to select the image tool required for generation, apply the editing and finally store the modified images to the PC. The color of each image pixel is represented as a color vector of 3 components/channels representing (red, green, blue) intensities. The range of color values of the image pixel lies between 0-1 in each channel. Where a pixel of color (1,0,0) has a pure red color, a pixel of (0,1,0) has a pure green color, a pixel of color (0,0,1) has a pure blue color. White pixels should have color of (1,1,1) while black pixels should have color of (0,0,0) The functions required are the following: 1) **Create Histogram for each color channel** The histogram is a representation of the frequency of color intensities, shown as adjacent lines, erected over discrete bins (numbers) ,in such function it's required to separate the image into its three color channels (R, G, and B), calculate the no. of pixels belonging to each color value and generate an image for each color channel histogram as the following:



2) **Image blending**

This function requires loading two images and generates their blending image. The blending function should be the following:

$C = \alpha F + (1 - \alpha) B$

where **C** is the composite color, **F** is the first image color, B the second image color. **α** is the pixel opacity component used to linearly blend both colors. The value of α should be entered by the user and should be within (0-1). Calculation is computed over each color channel (red, green, blue).

Group size	4 members.
Deliverables	1- A C++ application that performs the required task
Bonus extensions	1. Make it as windows application with GUI 2. Develop the application with image load and save from scratch without help of the basic application delivered
Mentor	T.A. Dina Khattab
Notes	You can make use from a basic application that runs under DOS and already implements the tasks of image load and save. **(contact your mentor for delivery)** Such application requires the installation of both openCV and openGL libraries in order to be able to run.

	Use the following URLS for download OpenCV download and setup (version 2.1 or higher) http://opencv.org/downloads.html OpenGL library download setup (taoframework-2.1.0-setup.exe) http://sourceforge.net/projects/taoframework/