DATA-STRUCTURE PROJECT

Problem statement:

Take any image of yourself and perform following operations using concepts of Data-Structure (eg: array, Linked List etc.) in C programming language.

In this assignment, you will write C code to read, write, and manipulate images. The objectives are the following:

- Familiarize yourself with reading/writing images from/to a file.
- Improve your skills with manipulating arrays.
- Learn about some simple image processing algorithms.
- Learn about the header part of the image of a specific image format
- Learn to document and describe your programs

You have to write a package to implement the image data type using arrays. The image data type should allow you to:

S.No	Task	Function
1.	Read an image from a file.	readImage(fileName, image)
2.	Save an image to a file.	writeImage(fileName, image)
3.	Get the detail/info of an image.	getImageDetail(noRows,noCols, maxVal)
4.	Returns the pixel value at (r,c) location.	getPixelVal(r,c)
5.	Set the value of a pixel at (r,c).	setPixelVal(r,c)
6.	Convert colour image to grey image.	colorToGray(image)
7.	Compute the average gray-level value of an image.	int meanGray()
8.	Convert gray image to binary	grayToBinary(image)
9.	Extract a sub image from an image (Crop Image)	cropImage(ULr,ULc, LRr,LRc, oldImage) [UL- upper-left; LR- lower-right]
10.	Reflect an image in the horizontal or vertical directions.	reflectImage(flag, oldImage) [flag- h or v for horizontal and vertical respectively]

Extra credit: [10 Credits]

1) Use filters to enhance the image quality **[3 Credits]**
2) Enlarge an image by some factor s. **[1Credits]**
3) Shrink an image by some factor s. **[1Credits]**

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4) Translate an image by some amount *t* (integer) . **[1Credits]**

5) Rotate an image by some angle theta. **[1Credits]**

6) **Image morphing:** Compute the sum of two images. (eg take the second image of your relative) **[1Credits]**

7) **Change detection:** Compute the difference of two images. (eg take the second image of your relative) and check the similarity with him/her. **[1Credits]**

8) Compute the negative of an image. **[1Credits]**