Digital Image Processing Lab

Experiment No 1

Write C/C++ modular functions to read, perform operations, and write BMP image files. All functions must support 24-bit RGB and 8-bit grayscale image formats.

1. **Read *.bmp* Image:**
   a) *Input*: Filename of input image
   b) *Output*: BMP header structure printing height, width, bit width, File size in bytes, offset size, image pixel array loaded onto memory.
   c) If the Image is not a *.bmp* it should print the message.
2. **Operations on the Image:**
   a) *Input*: Image pixel array
   b) *Output*: perform the following operations -
      a. Convert color image into grayscale
      b. Diagonally flip both color and grayscale images
      c. 45-degree and 90-degree rotation of both color and grayscale images
      d. Scale the images with different scale factors along with x and y axis
3. **Write *.bmp* Image:**
   a) *Input*: Filename of output image, BMP header structure, Image pixel array
   b) *Output*: Write all the generated images due to different operations into the disk using *.bmp* file format.
4. **Color Channel Manipulation:**
   a) *Input:* Read the file 'corn.bmp' using your previous ReadBMP function.
   b) *Output:* Set each channel of the 'corn.bmp' to zero at an instance (e.g., set the 'R' channel to zero and without changing the intensity values of other channels, repeat it for 'G' and 'B' channel) and save a *.bmp* file with modified pixel data.

Submit zip file and name it "Exp-01-<Roll No>. The file should contain C/C++ Code, Read Me File, Report in PDF Format, Input Images, Output Images.