Problem Statement

The program should be designed to perform simple image manipulation using openCV. It should load an image by either reading it from a file or capturing it directly from the camera. The user should be allowed to perform manipulation to the image by pressing specific keys on the keyboard. This program uses all the basic image manipulation functions and allows for understanding basic image manipulation functions.

Proposed solution

This program uses basic openCV functions to perform smoothing, rotation, convolution, sampling, etc. The user is allowed to press specific keys on the keyboard to perform these functions. The program consists of loops, def blocks, and openCV functions to implement most of the tasks required. There is no specific algorithm used to implement these functions, most of the functions are based on using logic and the inbuilt functions present in the openCV library.

Implementation details

The program was designed in python to perform basic image manipulations. It uses the numpy and openCV libraries to perform image manipulation. The program takes a while to load and also takes time to perform functions. This reduces the efficiency of the program.

There were problems which aroused while capturing an image and also while trying to create a trackbar. These problems were overcome by further research into these topics.

Manual:

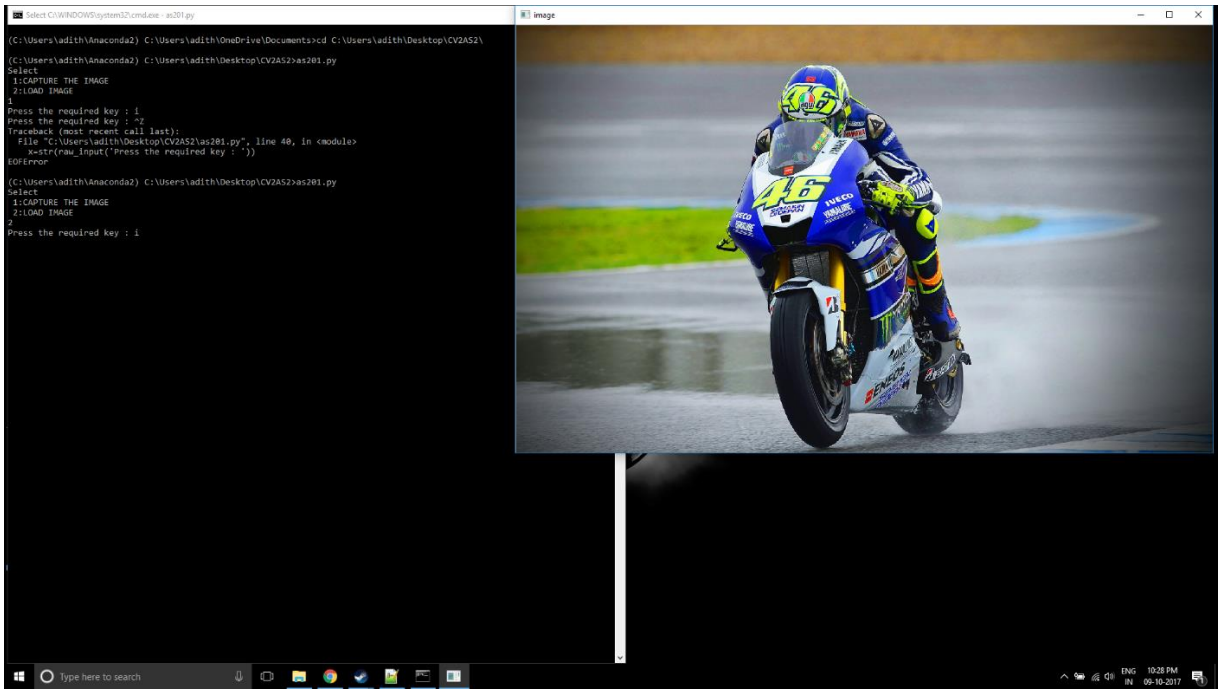
- Open the terminal.
- Go to the directory where the program and image is present.
- Type AS2.py
- Enter specific keys to perform image manipulation.

Results and discussion

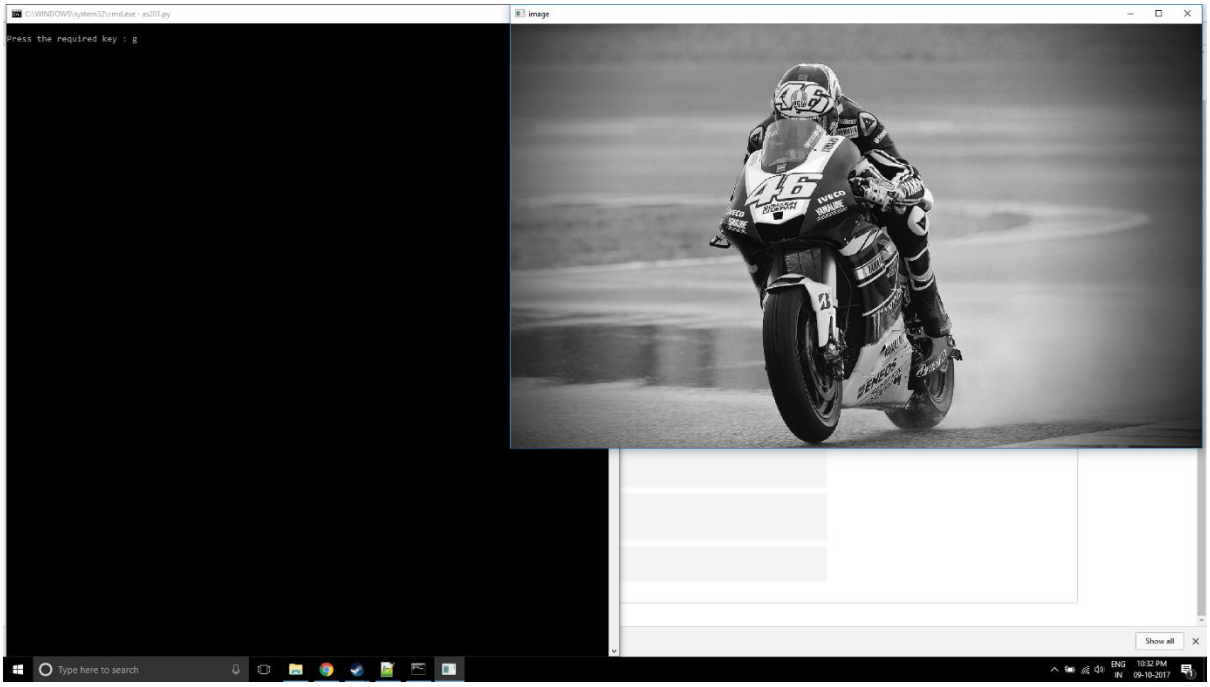
The user is allowed to either load or capture the image at the start:

He can press 1 for capturing an image or 2 for loading an image.

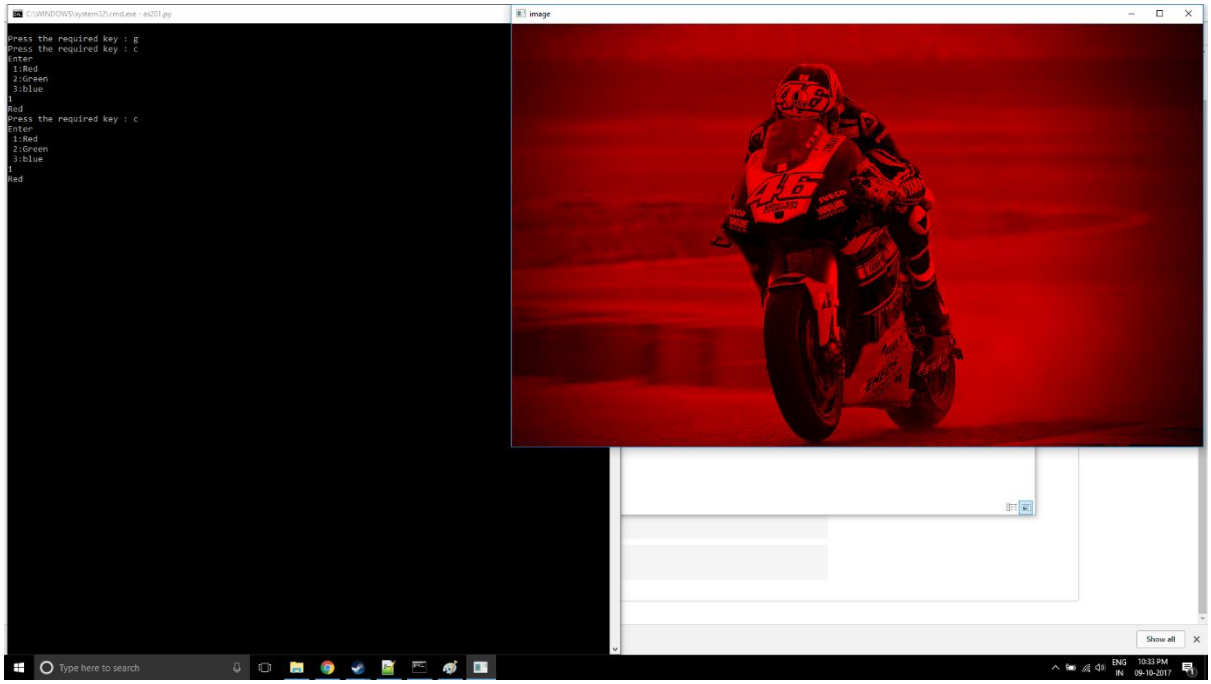
Implementation of ‘i’:



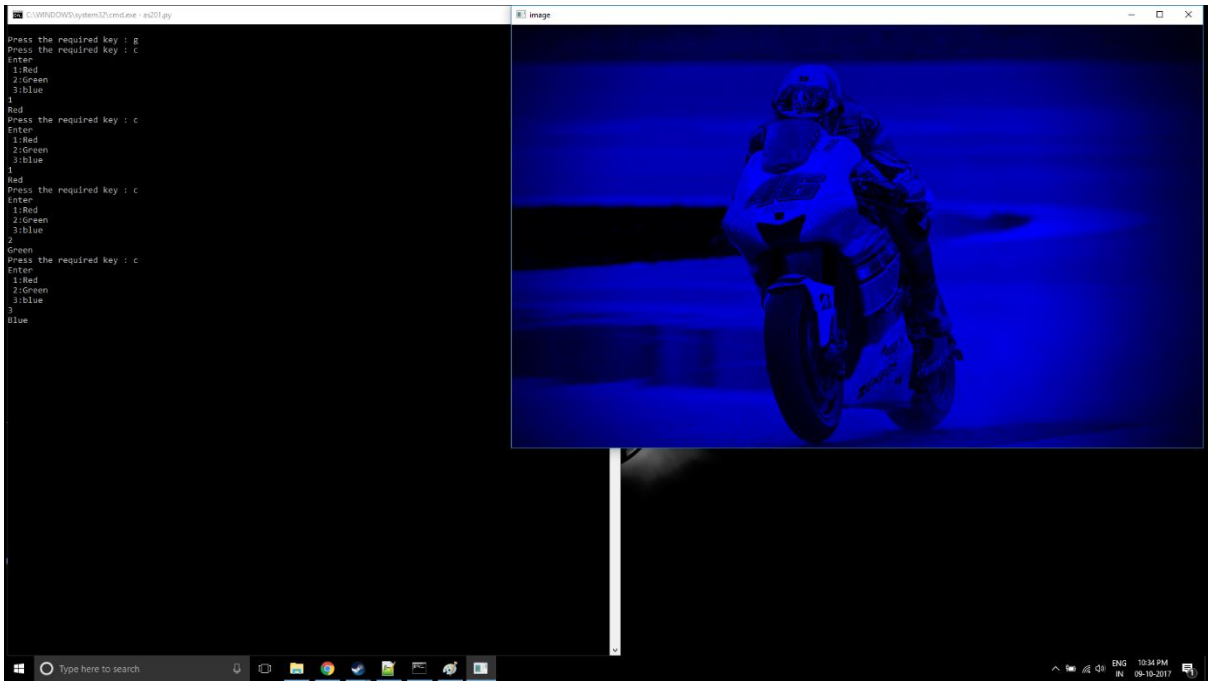
Implementation of ‘g’:



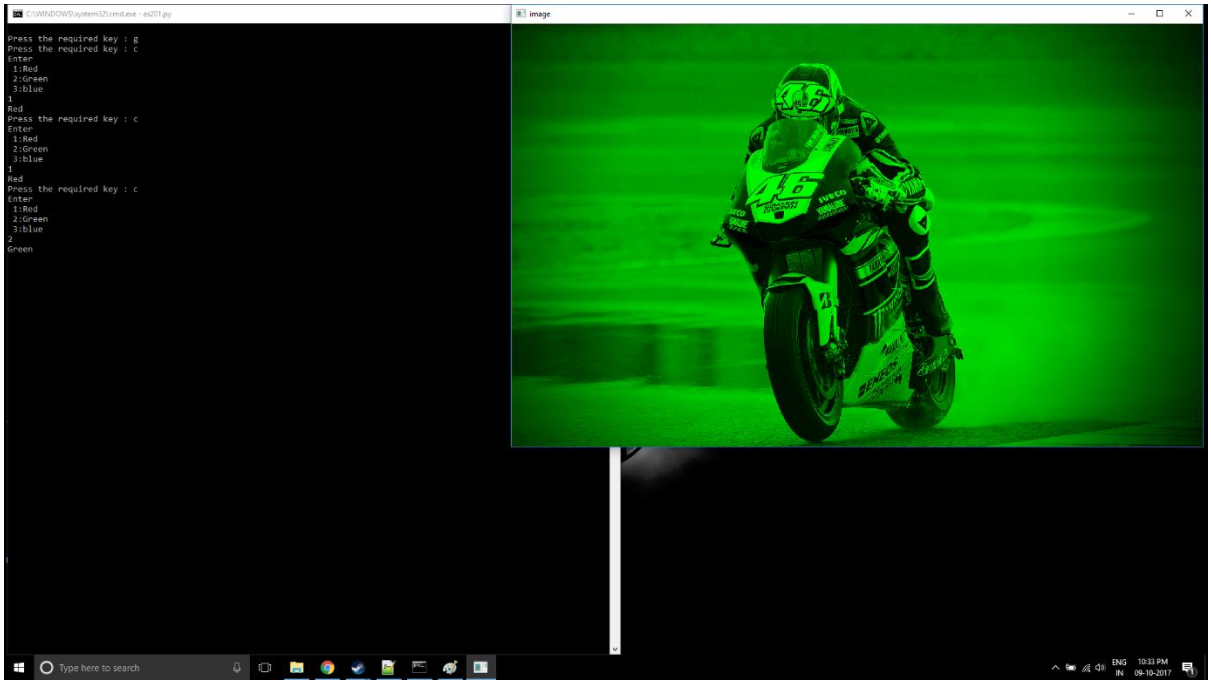
Implementation of ‘c’ in red channel :



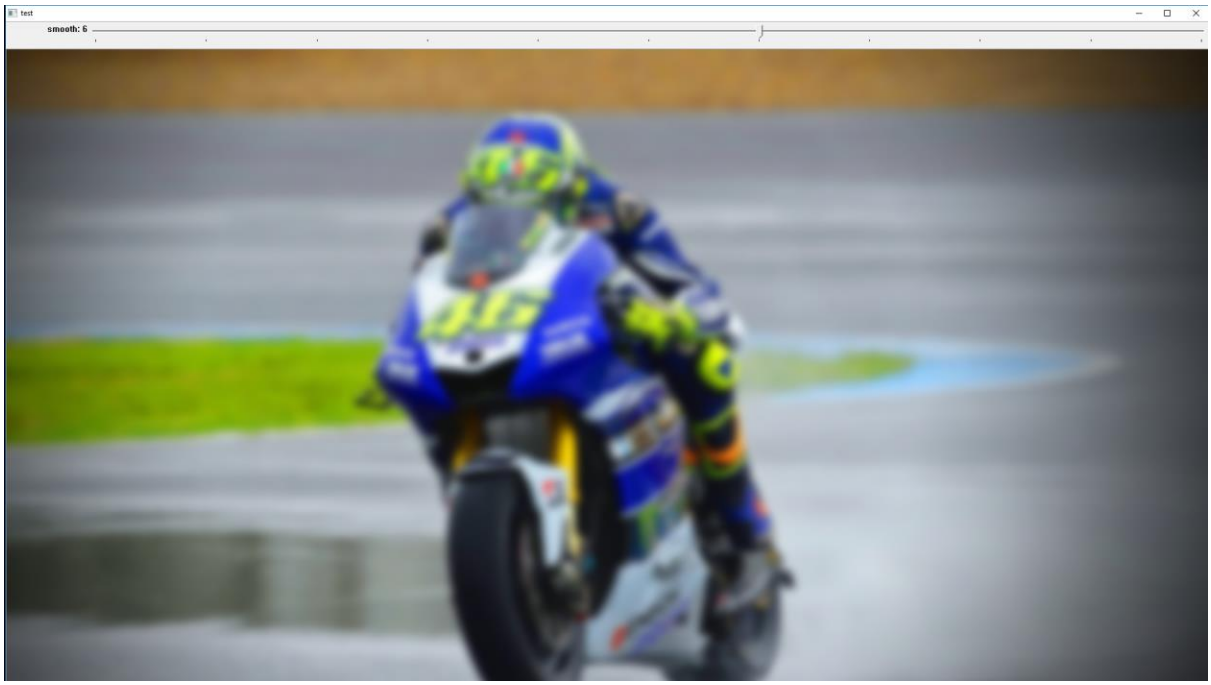
Implementation of ‘c’ in blue channel :



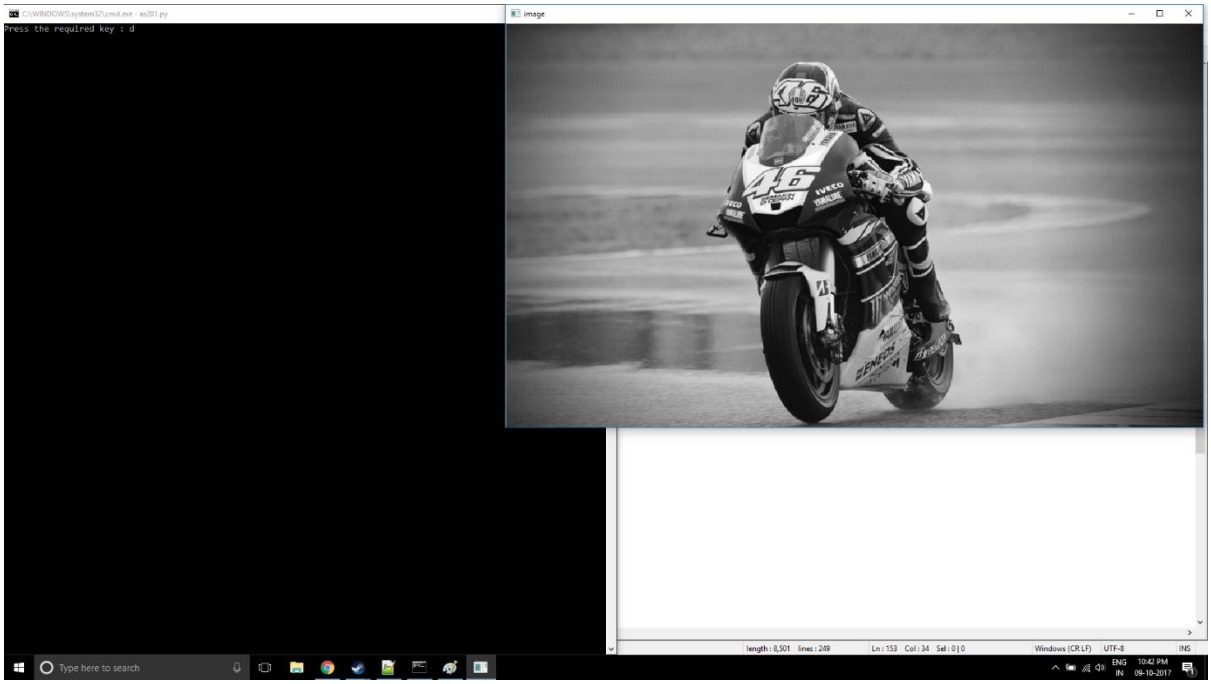
Implementation of ‘c’ in Green channel :



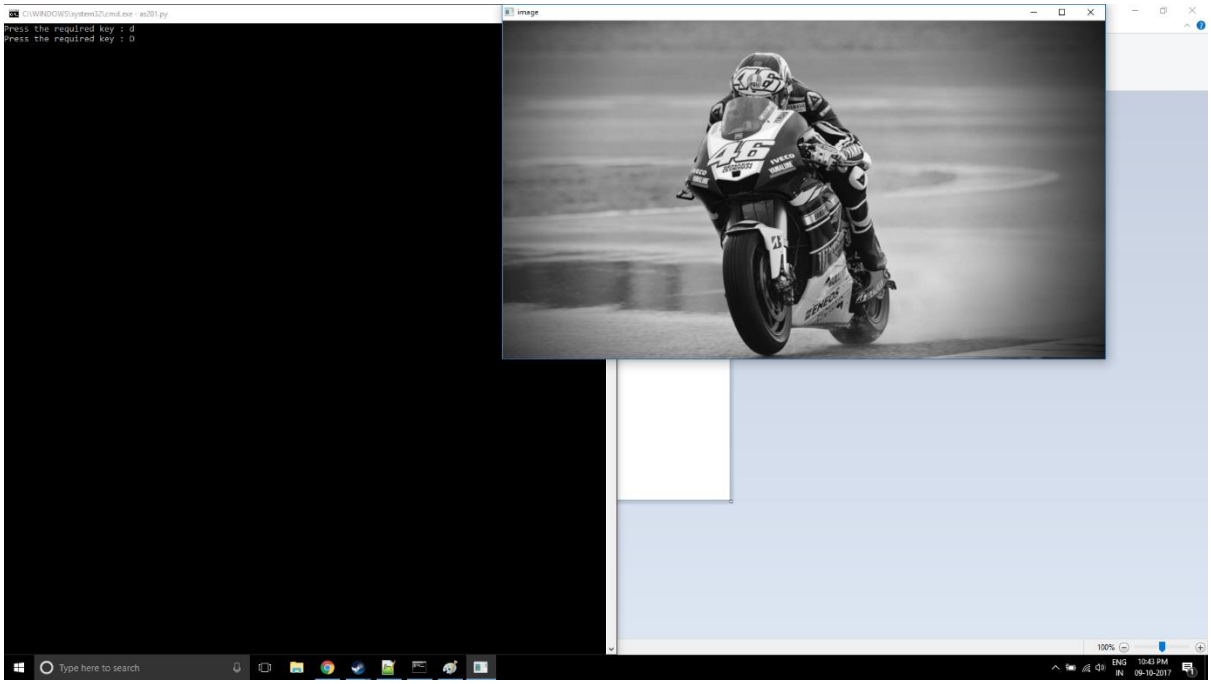
Implementation of ‘s’ :



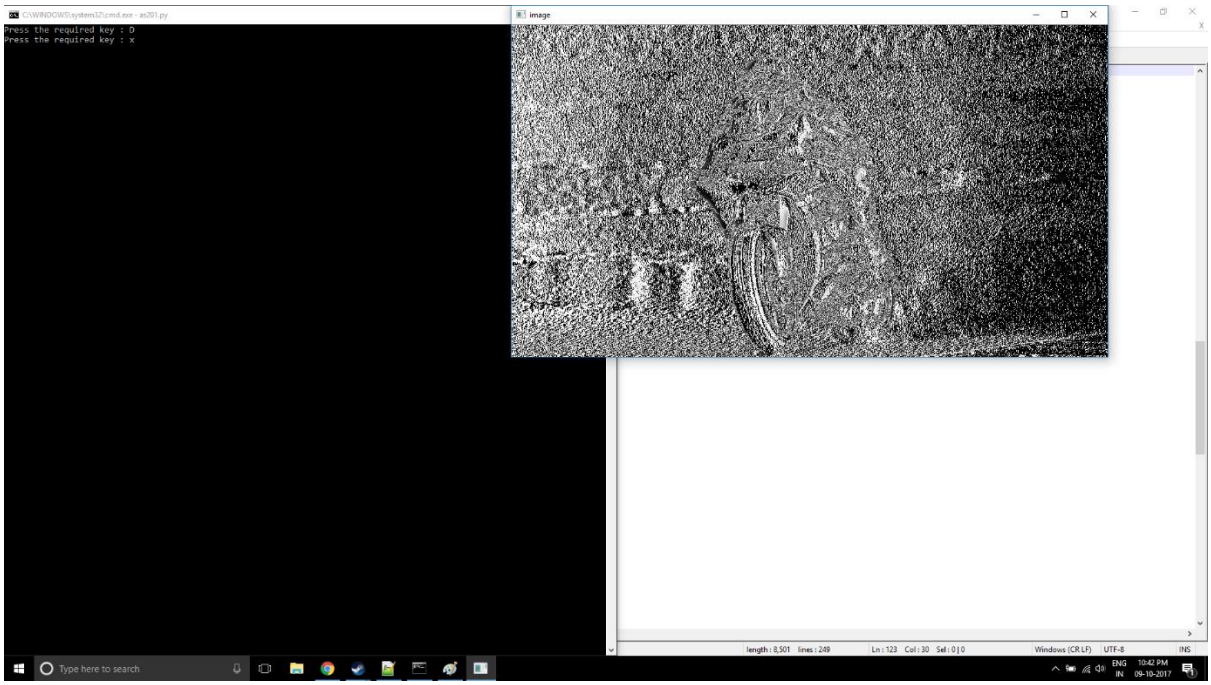
Implementation of ‘d’ :



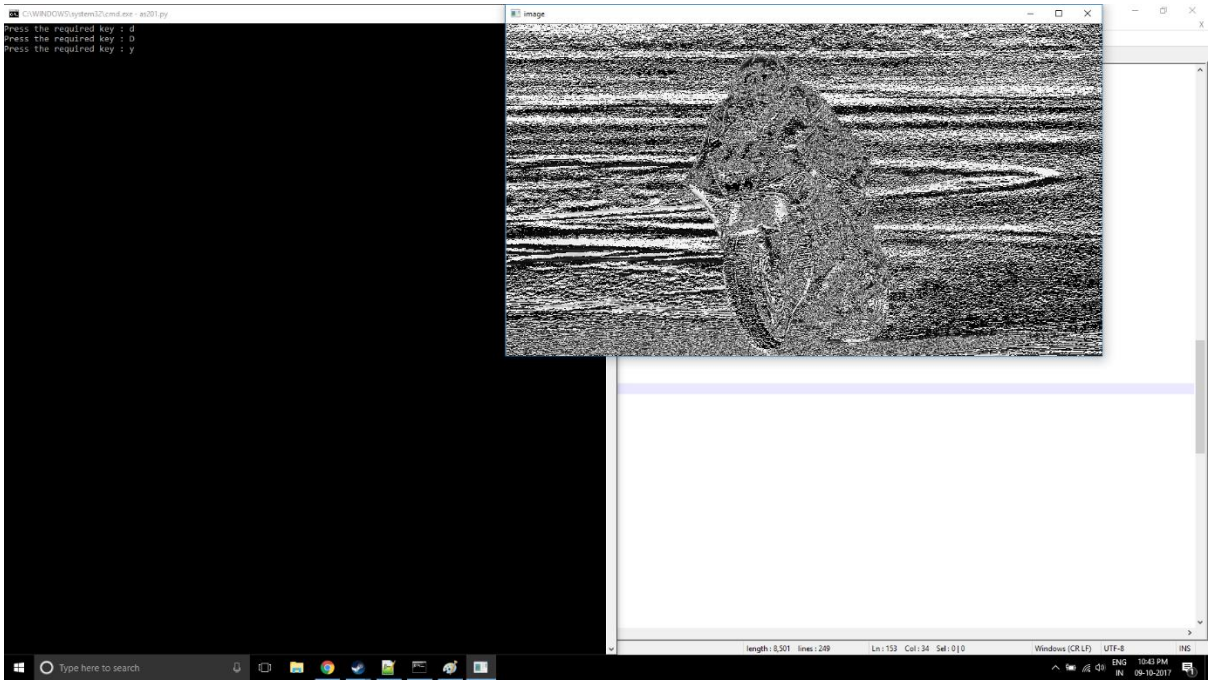
Implementation of ‘D’ :



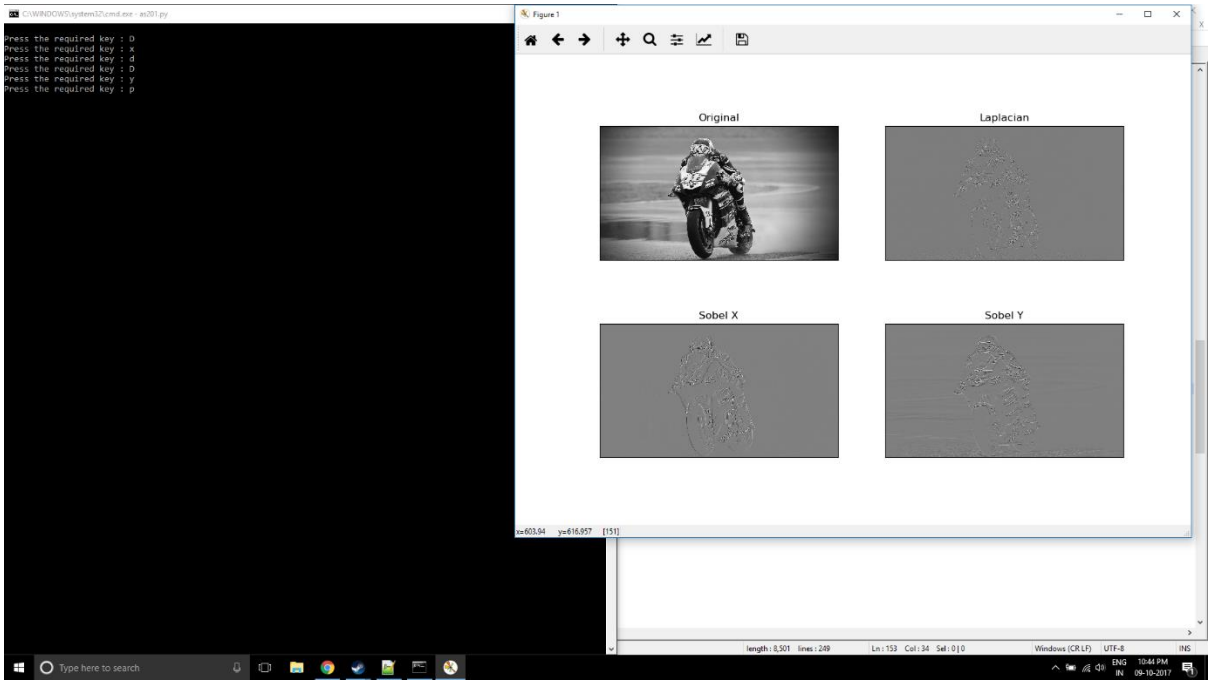
mplementation of ‘x’ :



Implementation of ‘y’ :



Implementation of ‘p’ :



Implementation of ‘r’ :

The program implemented allows for basic image manipulation by using techniques from computer vision. The program takes time to load images and this depends on the CPU processing speed.

References:

1. https://docs.scipy.org
2. http://docs.opencv.org
3. https://stackoverflow.com