**BAHRIA UNIVERSITY, ISLAMABAD**

**Department of Computer Science**

**CEN 444**

**Digital Image Processing**

**Lab Journal 2**

**Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Enrolment No.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Title: Basic Image Processing Operations.**

**Objectives:** To introduce you to the basic functions in the Opencv. To be able to read images from the disk display them, write them back to the disk and perform conversions between different image classes.

**Tools Used:**  Jupyter Nootebook

**Instructions for Submission:**

 **Create a main repository** for the entire course on GitHub.

 **Within this main repository**, create separate folders for each week's content.

 **Upload your Jupyter notebooks** into the appropriate folder for each week.

 For the final submission, simply **upload a PDF file** that contains the GitHub link to your repository.

**Task 1:**

1. Load any image, find its dimensions and number of channels and display it.
2. Find the size, date, coding method, bit depth, height and width.
3. What happens if you convert a double having values outside the range [0 255] to an uint8?

**Task 2:**

Load any image, binarize it, using the function ‘cv2.threshold’ with a threshold of 127 and display both original and binarized images.

**Task 3:**

The function rgb2gray() can be used to convert three channel-colored images into single channel gray scale images.

Write program which reads any image in the. Find the size of the image and the number of channels in it. Use if else. If it is a three-channel image, then:

* display that it is a three-channel image
* then convert it to grayscale.
* Now binarize the gray image.
* Finally, display it.

If it is a one-channel image, then:

* display that it is a one-channel image
* Just display image.

**Task 4:**

Write which reads the image. Binarize the image using your own implementation rather than the functions. Use two loops (nested), compare each value with a given threshold and generate the output image.

**Task 5:**

Open webcam and perform gray scaling on the video frames, you can use opencv functions for gray scale.

**Submission Date: Signature:**