Date: 11-12-2021 **Assignment # 02**

Subject: Digital Image Processing

Total Marks: 100

Note: Submit your assignment (Python code) online on Slate. A zero grade will be given if your assignment is found copied. Oral interview is mandatory; I will randomly call you all for an **oral interview** to validate your effort. **Deadline** for submission is **16:00 PKT, Sunday, 19 Dec 2021**.

Question # 01:

Develop a **Python** program that lets its user to input a **grayscale image** and displays the input image as well as its size. The program should also provide functions to perform each of the following basic operations and display the results:

1. The program should provide a **function** to calculate Sobel (edge profile) of the input image.
2. A **function** to compute the Laplacian of Gaussian (LoG), also called Maxican hat filter, of the input image. Read related literature. You may also find information in the book.
3. A **function** to compute the signal to noise ratio of the input image.
4. The program should provide a **function** to convert the input image to frequency domain and display the magnitude and phase spectrums.
5. The program should provide a **function** to perform the high pass filtering on the input image with the given cutoff distance (give radius size as a parameter of the function).
6. The program should provide a **function** to perform the low pass filtering on the input image with the given cutoff distance (give radius size as a parameter of the function).

The above functions must also display the processed image after the operation is done.

Note: For testing your program use relevant chapter images of your textbook. Images are freely available online and can be downloaded from the following link:

Link: http://www.imageprocessingplace.com/root_files_V3/students/students.htm

xxx------- Good Luck! -------xxx