This assignment aims to deal with image transformations on Chest X-ray data.

Images shall be taken according to the roll number mapping mentioned at the last of this document.

The data folder can be downloaded from here

Use the assigned images for all the tasks in this assignment.

Part 1: Geometric transforms

For target to source mapping, use bilinear interpolation.

1. Translate the image by tx = 5.5 and ty= 4.4 pixels
2. In plane rotate the image about the image centre with an angle of 35° and -125°
3. Scale the image by a factor of 0.4 and 1.4

Summarize your observations.

Part 2: Histograms

1. Use the input image assigned to your roll number and try to enhance the contrast of the image using histogram equalization technique.
2. Summarize your observations.

Part 3: Understanding of various types of noise and filters

Use the input image assigned to your roll number and with reference to the paper attached,

1. i. Introduce salt and pepper noise with two different noise variance and
   ii. Apply
       a. Mean filter
       b. Median filter
       c. Gaussian filter

   with CLAHE technique to denoise.

   iii. Evaluate the performance of the filter using the metric Peak Signal to Noise Ratio (PSNR)
2. i. Introduce Gaussian noise with two different noise variance and
   ii. Apply
       a. Mean filter
       b. Median filter
       c. Gaussian filter

   with CLAHE technique to denoise.

   iii. Evaluate the performance of the filter using the metric Peak Signal to Noise Ratio (PSNR)

Tabulate the performance of various types of filters with CLAHE technique for both types of noise.

Visualize the input and the contrast enhanced image using histograms.

Note: For all parts code in MATLAB or Python and summarize your observations and results in a document and submit the code and summary document as one zip file. For part 2, describe the process with the help of flow chart, write a Pseudo code.

To avoid confusion in the code execution sequence, you can attach a readme file in .txt format, if required.

Submit the assignment on or before 9th September 2021, 11.59 PM.

Roll No.	Image name(.ppm)
AE17B020	1
AE18B024	2
AE19B039	3
AE20D412	4
AM20D010	5
AM20S052	6
AM21D021	7
BE17B011	8
BE17B019	9
BE18B010	10
BE18B012	11
BE18B021	12
CE18B125	13
CE18B136	14
CE19D201	15
CH18B114	16
CL21M011	17
ED17B001	18
ED17B055	19
ED18B002	20
ED18B004	21
ED18B007	22
ED18B009	23
ED18B012	24
ED18B013	25
ED18B017	26
ED18B021	27
ED18B022	28
ED18B024	29
ED18B025	30
ED18B028	31
ED18B031	32
ED18B033	33
ED18B034	34
ED18B035	35
ED18B036	36
ED18B037	37
ED18B039	38
ED18B043	39
ED18B045	40
ED18B047	41
ED18B048	42
ED18B049	43
ED18B052	44
ED18B054	45
ED18B056	46
ED20D402	47
ED20D601	48
ED20S014	49
ED21S001	50

ED21S006	51
ED21S007	52
EE19S046	53
EE20S046	54
EE20S047	55
EE20S049	56
EE20S051	57
EE20S052	58
EE21D023	59
EE21S050	60
EP18B007	61
EP18B021	62
ME17B016	63
ME17B144	64
ME21S032	65