

Problem Statement:

The goal of this assignment is two-fold:

- a) Smooth the noisy image attached by using a mean (average) filter in 3x3 window iteratively until satisfactory results are obtained. Show the results for 1 5 10 iterations.
- b) Do some research on median filters and advantage of median filter over mean filter. Apply median filtering in 3x3 window to smooth the noisy image given below and, iterate 1, 5, 10 times and show the results. Write your conclusions after you compare the results from average filter and median filter

Conclusion:

If we compare the results obtained from the average filter (convolve function) to median filter we notice that the images are less blurry on the median filter, especially as we go at higher iterations (5 and 10 respectively), making it a better filter when compared to mean spatial filter. This is because median filters are used to remove specific noise types such as "Gaussian", "random", and "salt and pepper" noises. When implementing the median filter program in python, the center pixel of the $M \times M$ neighborhood is replaced by the median value of the corresponding window, thus resulting in a clearer image.