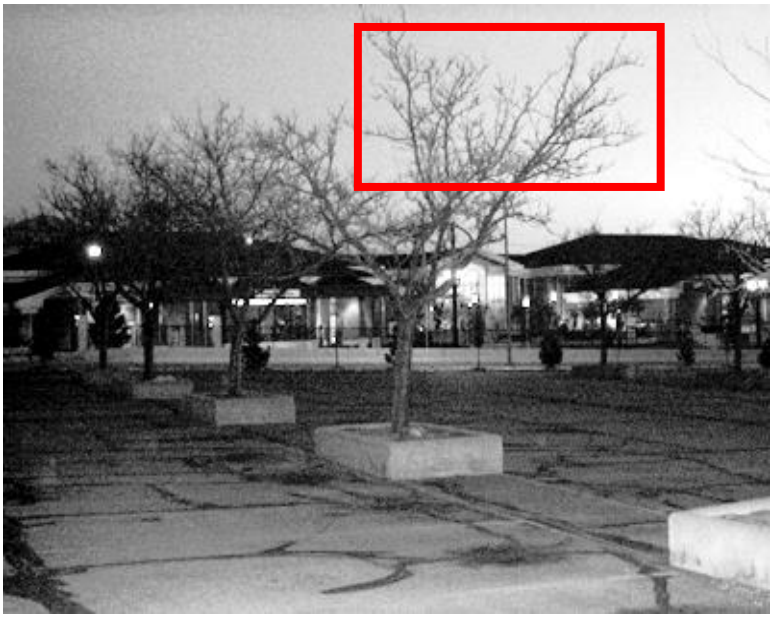
9. Implement local histogram equalization of sizes 7 × 7, 31 × 31, 51 × 51, 71 × 71 on the images 'LC1.jpg' and 'LC2.jpg' from the homework folder. Comment on your results in your report and compare it to global histogram equalization, which you can use from the image processing toolbox of MATLAB. Point out regions where the local method produces better local contrast than the global histogram equalization. [15 points]

ANS.

For image LC1.png:-

Original Image:-

7X7 local histogram



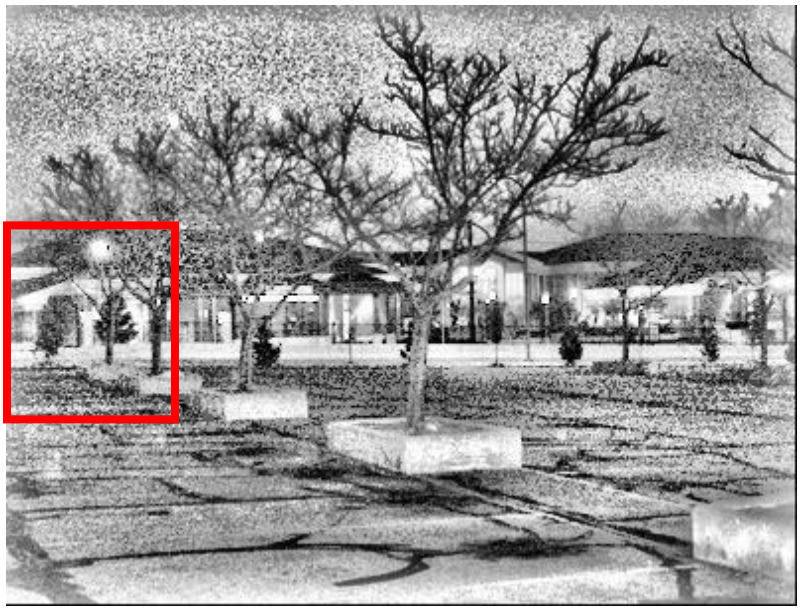
Global histogram

Here the 7X7 bin local histogram looks bad, though on the pointed tree with red box give more sharper edges of the branch of the tree which gives more information about number of braches and gives more clarity in that particular are specialy.

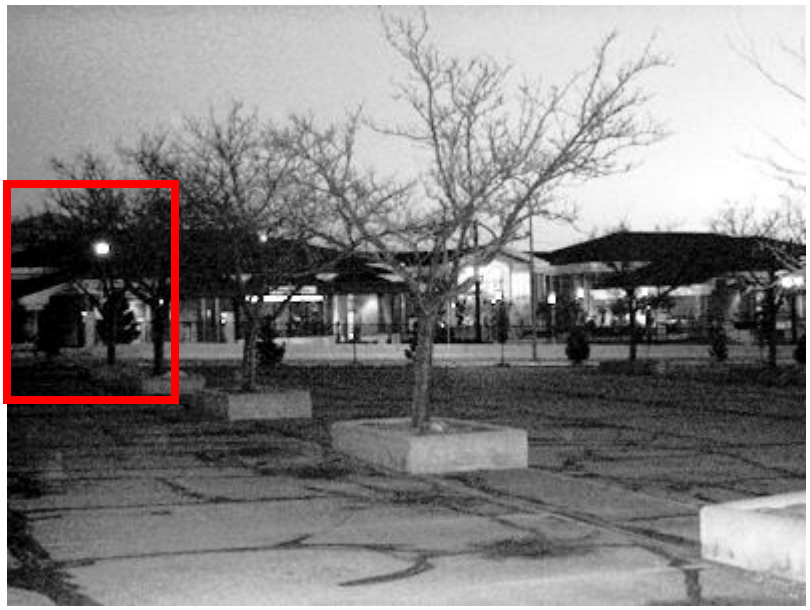
31X31 local histogram

Global histogram

Here 31X31 bin local histogram image appear better than the 7X7 still able to reach at its max, but the ground lines are more visible and are more darker/sharper, it appear that it was sloppy surface in local histogram it can be confirmed by the white line appear above than the black which was missing in global.



51X51 local histogram



Global histogram

Here in 51X51 bin local histogram has not much changes than 31X31 but the window of house is clearly visible in local than in global histogram. And few more part got darker than the previous. And boxes which pointed there the tree area is also properly visible in local histogram one.

71X71 local histogram

Global histogram

Here in 71X71 is getting better and better and reaching up to global by generalizing the histogram across different intensity, the point b on left is subsequent to the previous got much better and window more visible, however in right box the tree above the house is visible much better in local histogram.

For Image LC2.jpg (orginal image) :-

7X7 local histogram

Global histogram

Here 7X7 is too bad it just shows the outline of the image edges, much improvement need in this image if more and more edges between the branches is detected then it will come closer to global.

31X31 local histogram

Global histogram

Here in 31X31 local histogram is far better than 7X7 bin local histogram, and also in the pointed space the edges got darker, in global histogram is got faded with white color (low contrast and most intensity value of white in pointed area) which is looking as snow, but in local histogram it is better scene of ground,

51X51 local histogram

Global histogram

Here in 51X51 bin local histogram, right side box in global histogram is more darker mean low contrast and low intensity close to 0, while it got appropriatly fine in local histogram, and the bottom got better than previous 31X31 histogram here ground is much more visible.

71X71 local histogram

Global histogram

Here 71X71 bin histogram, right side box both top and bottom is getting better than the previous one but if you see left box the new tree appear which is not clearly visible in global histogram.

Both the Image LC1 and LC2 here global generalize better than all the local histogram, though some times local give more number objects and give much more information from the image. Hence we think global do better enhancement by equaling each intensity in the histogram.