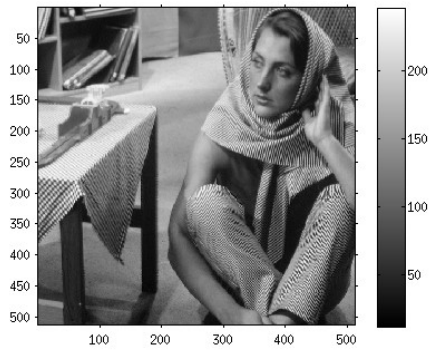
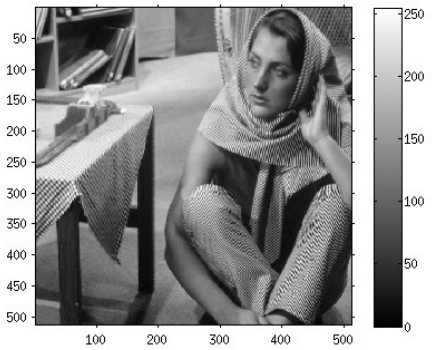
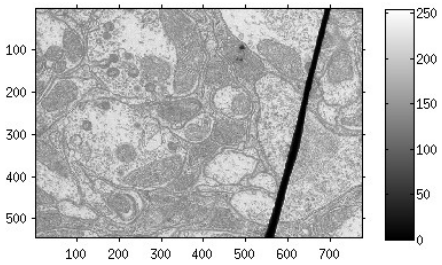
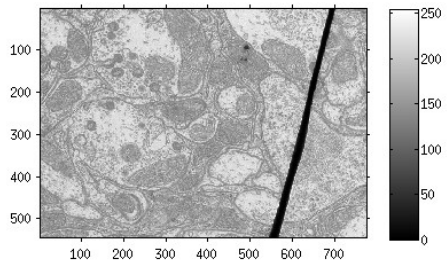
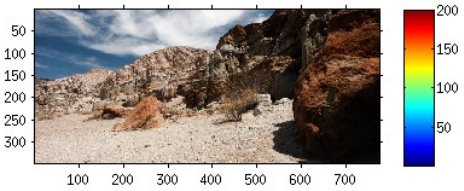
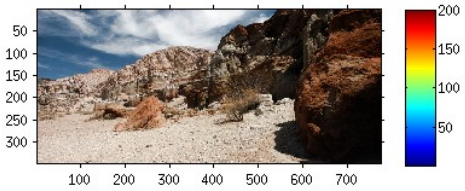
CS663 Assignment 1 Question 2 Report

Part 1: Linear Contrast Stretching

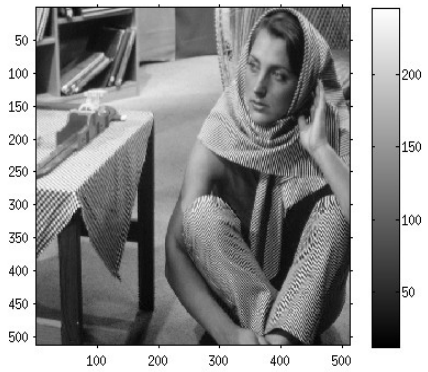
Original image on the left, enhanced image on the right.

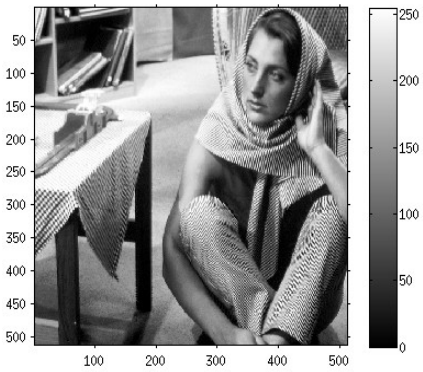
The algorithm used for the contrast stretching is the following: The lowest intensity range is mapped to 0 and the highest is mapped to 255. The formula is:

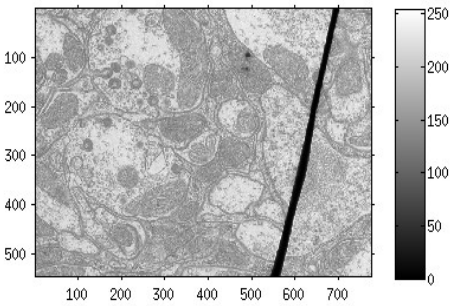
$$outputPixelValue = \frac{inputPixelValue - minPixelValue}{maxPixelValue - minPixelValue} \times 255$$

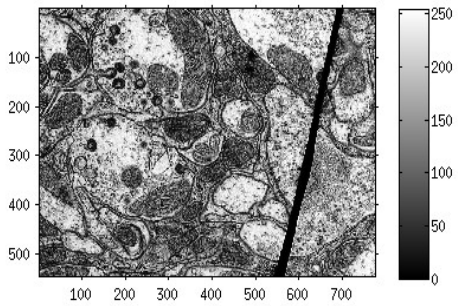
There is not much difference between the original and enhanced images because the intensity range in the original images was nearly the full range.

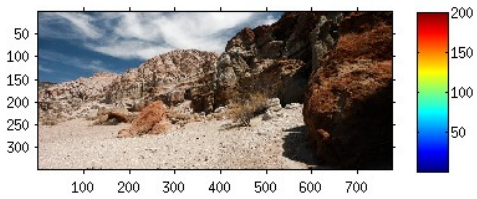
Part 2: Histogram Equalization

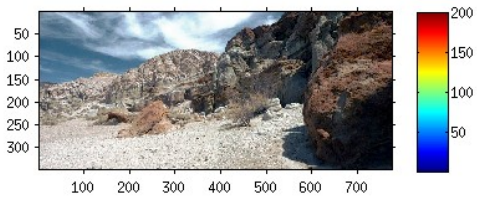






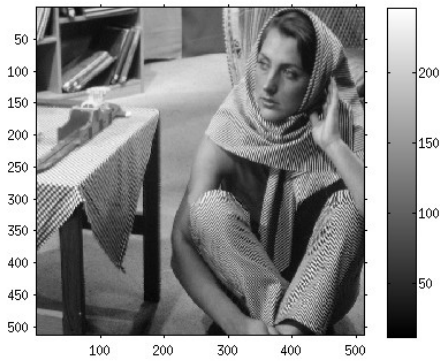


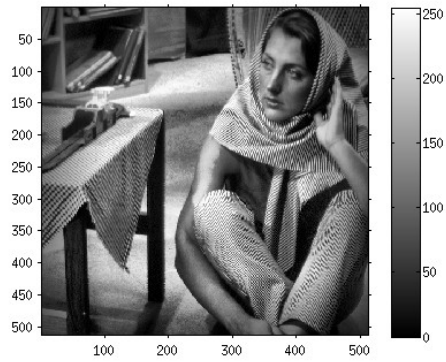




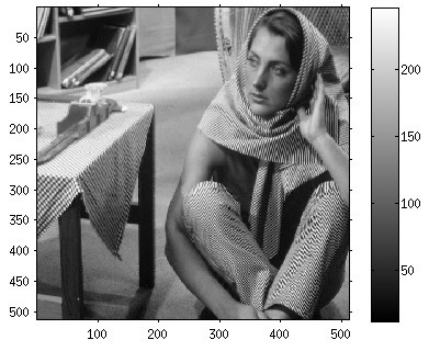
Part 3: Adaptive Histogram Equalization

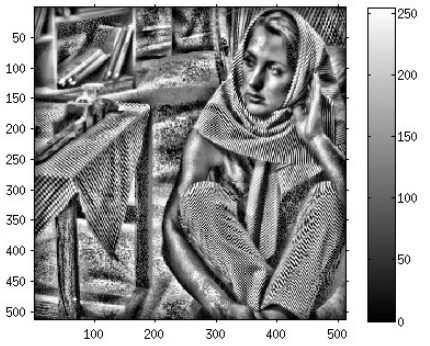
Image 1



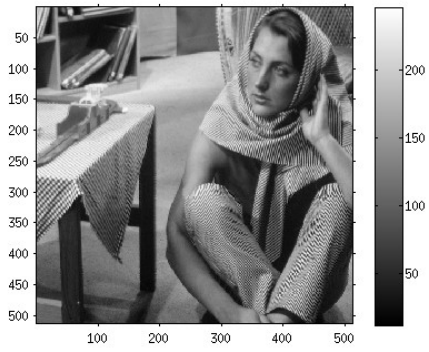


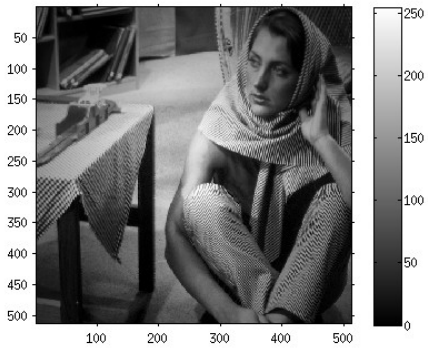
Best result using windowSize = 100





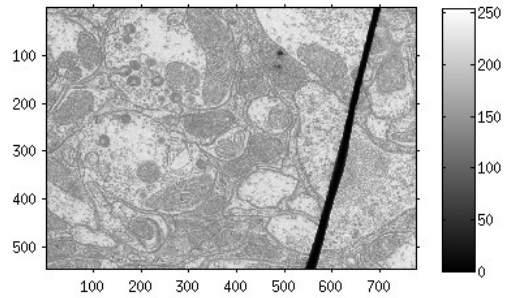
Excessive noise amplification with windowSize = 20

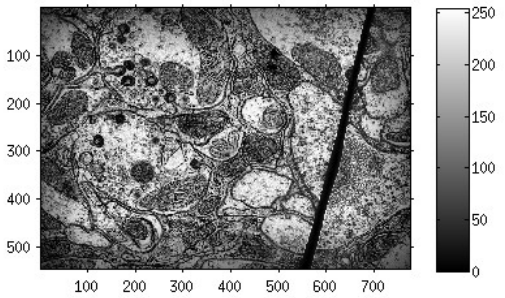




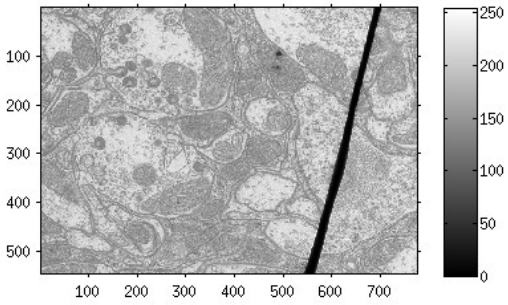
Low contrast improvement with windowSize = 300

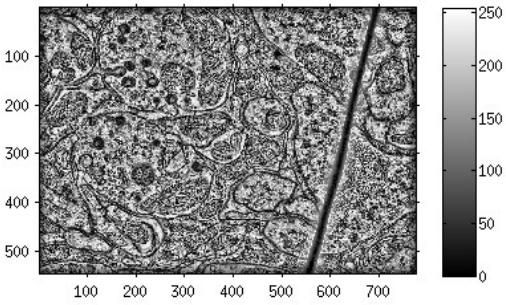
Image 2



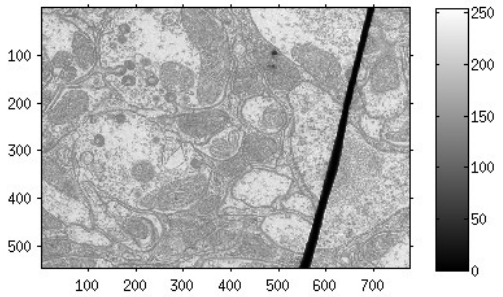


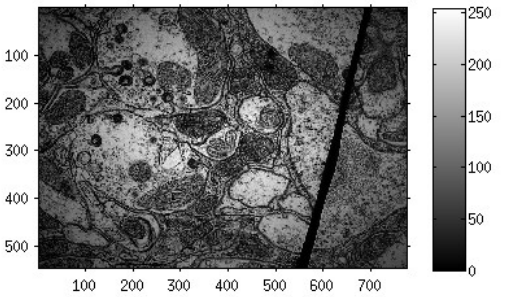
Best result using windowSize = 100





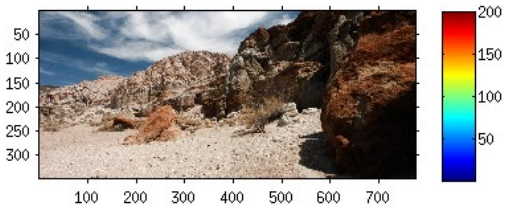
Excessive noise amplification with windowSize = 20

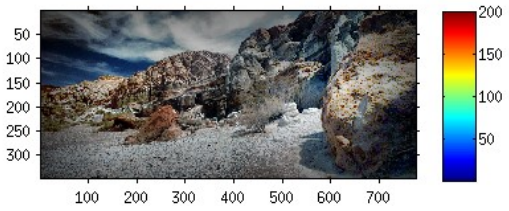




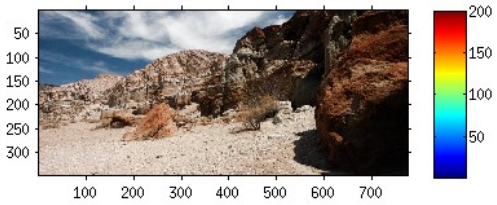
Low contrast improvement with windowSize = 300

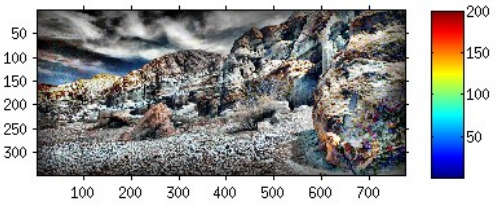
Image 3



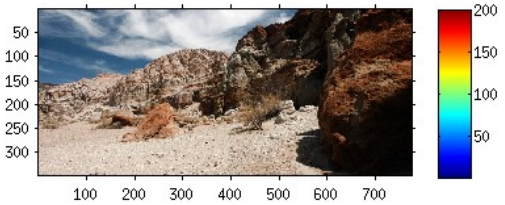


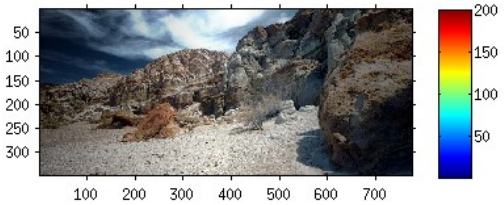
Best result using windowSize = 150





Excessive noise amplification with windowSize = 50

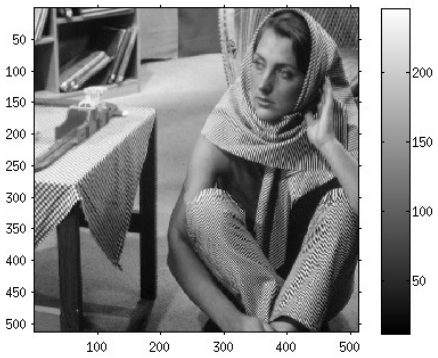


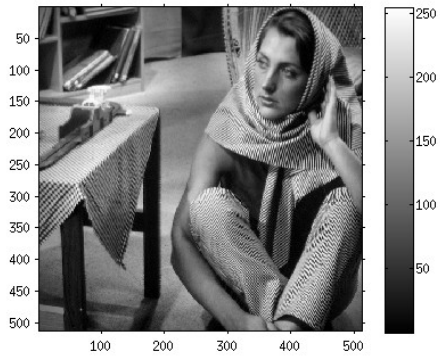


Low contrast improvement with windowSize = 350

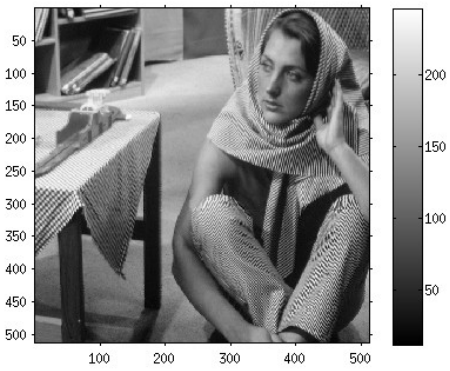
Part 4: Contrast-Limited Adaptive Histogram Equalization

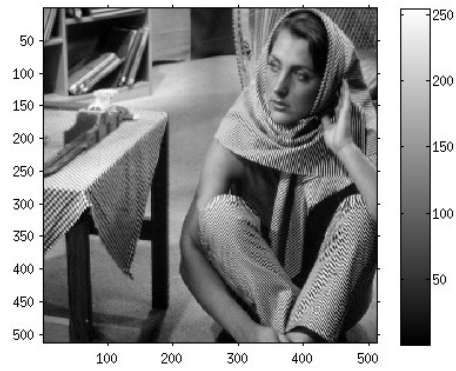
Image 1





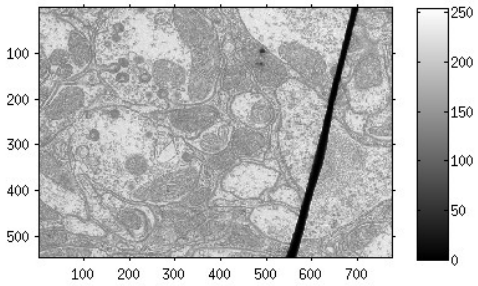
Best result with windowSize = 100, clipValue = 128

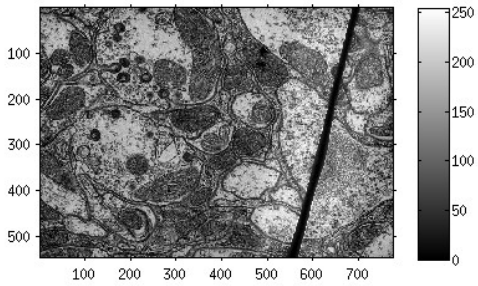




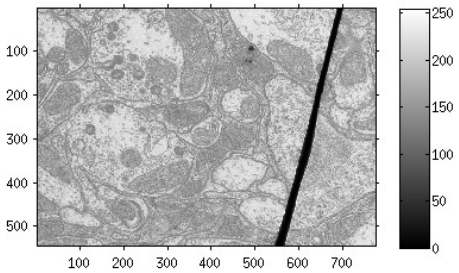
Result with clipValue = 64

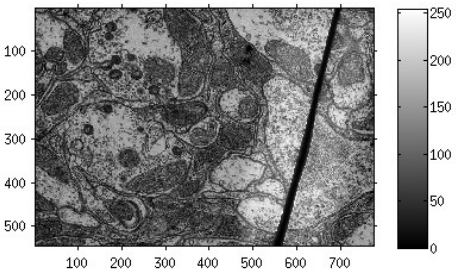
Image 2





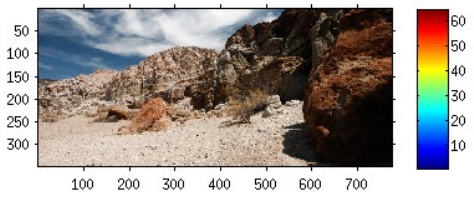
Best result with windowSize = 100, clipValue = 128

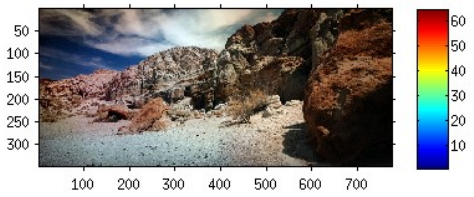




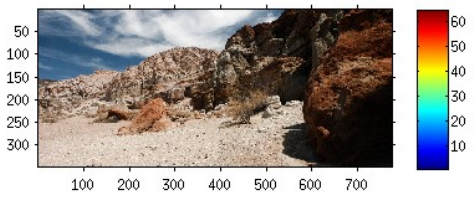
Result with clipValue = 64

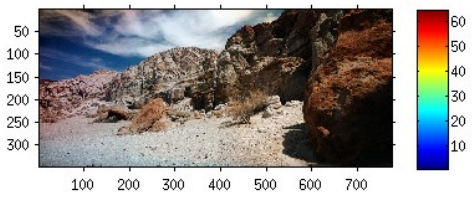
Image 3





Best result with windowSize = 150, clipValue = 200





Result with clipValue = 100