



IMAGE PROCESSING

Assignment One



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Introduction

This report contains all the important figures displayed from each task.

Task 1: Interpolation (25pts)

Figure 1: Original Input Image Display

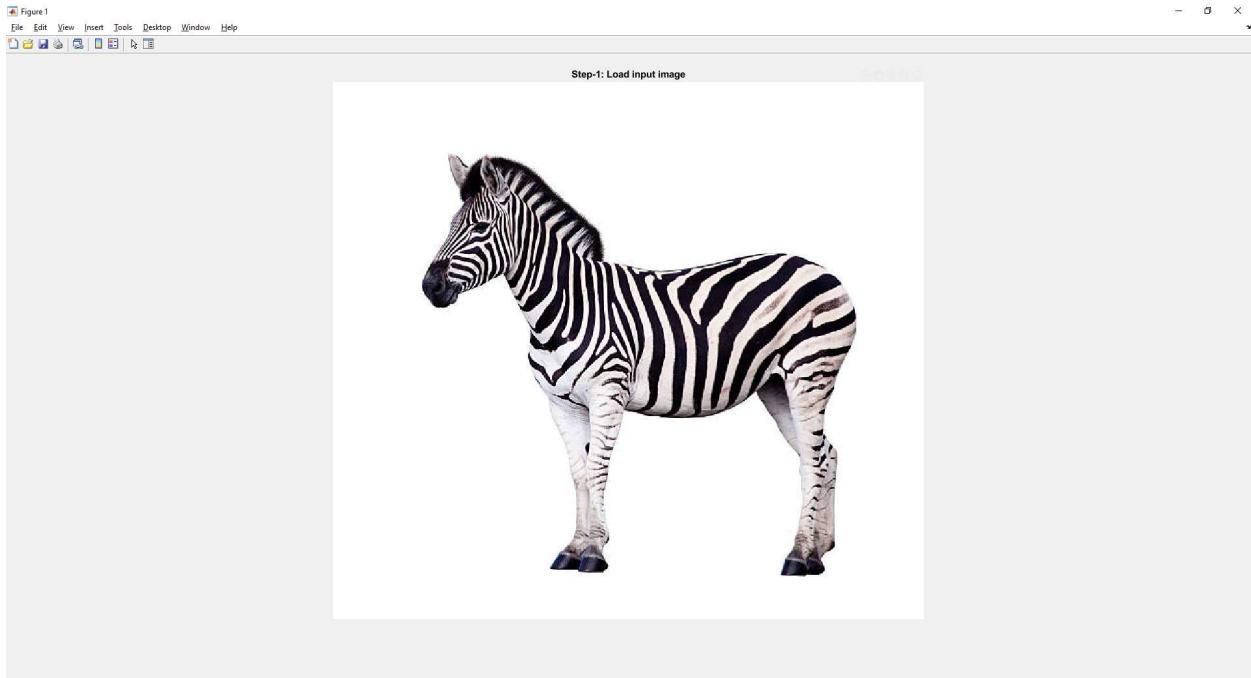


Figure 2: Grayscale of Input Image

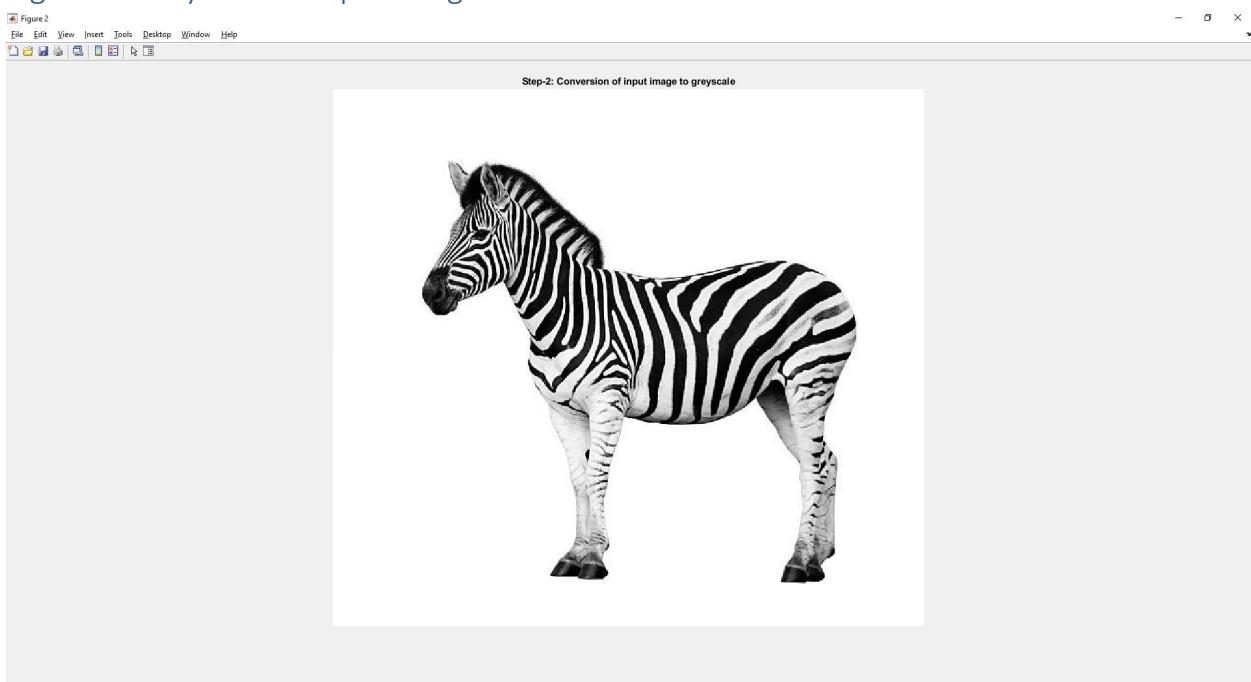


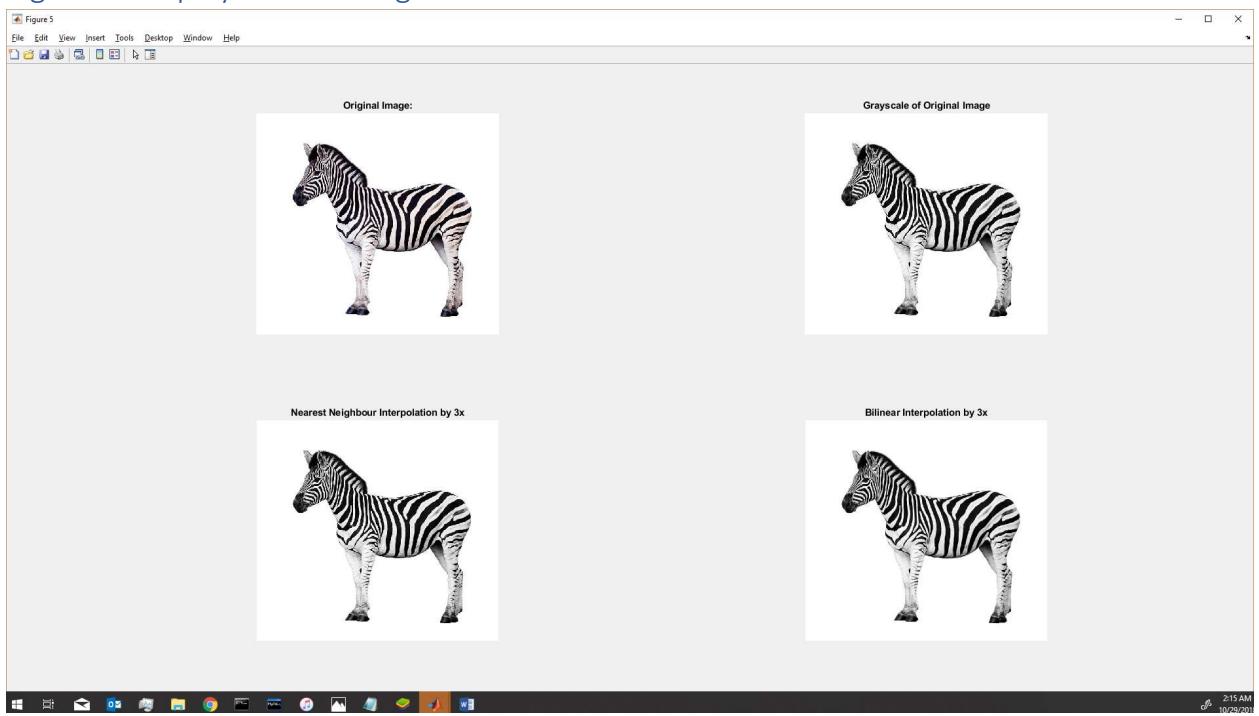
Figure 3: Nearest Neighbour Interpolation:



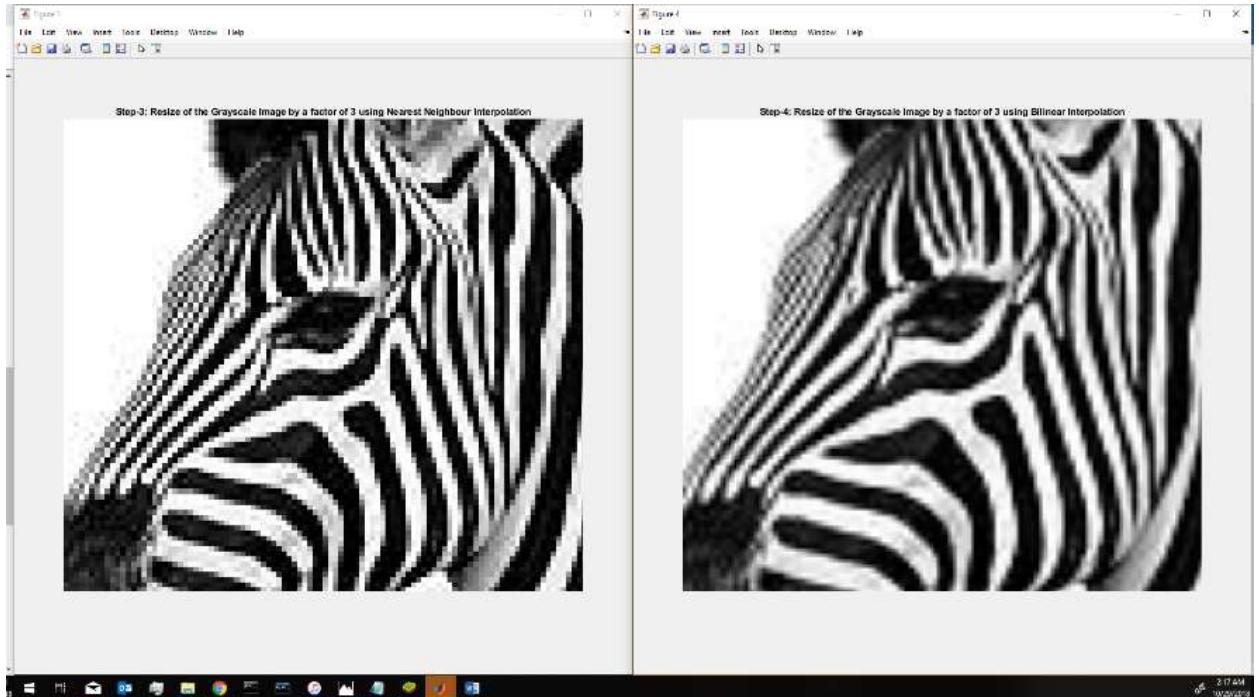
Figure 4: Bilinear Interpolation:



Figure 5: Display of all 4 Images in one Window



Nearest Neighbour Interpolation Vs Bilinear Interpolation Zoomed in View:



Task 2: Neighbourhood Processing (25 pts)

Figure 1: Original Input Image



Figure 2: Grayscale of Input Image



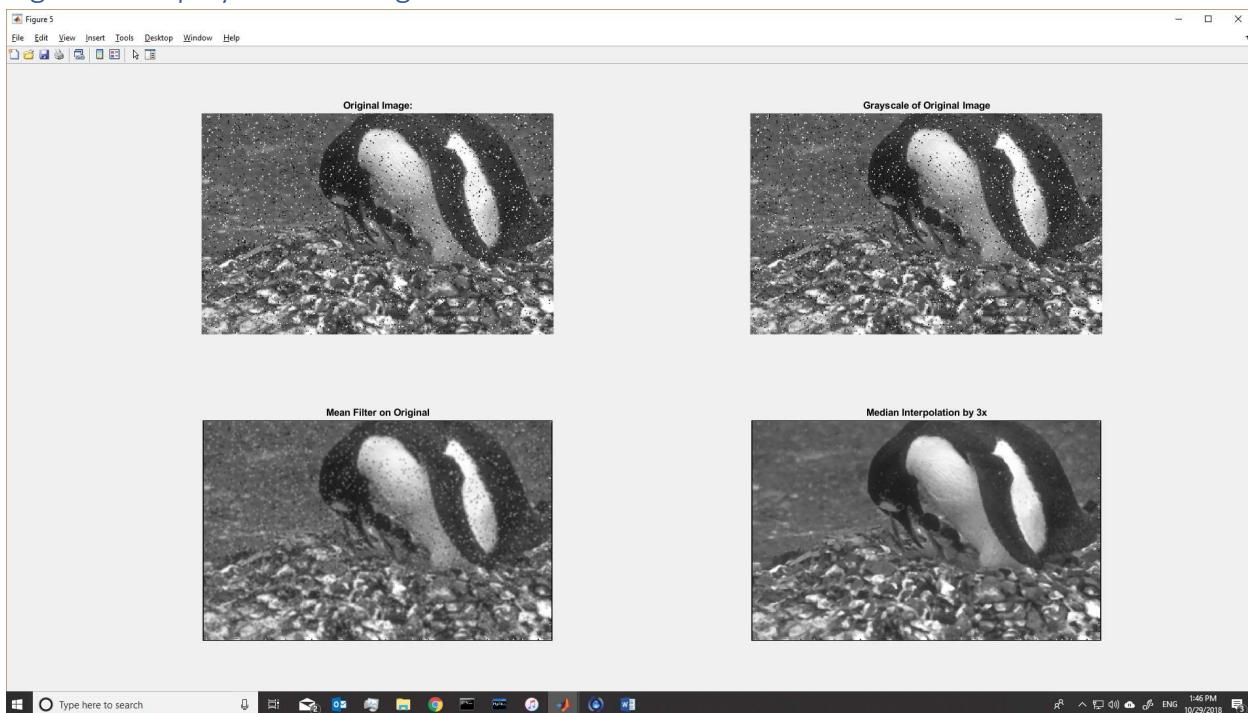
Figure 3: Mean Filter



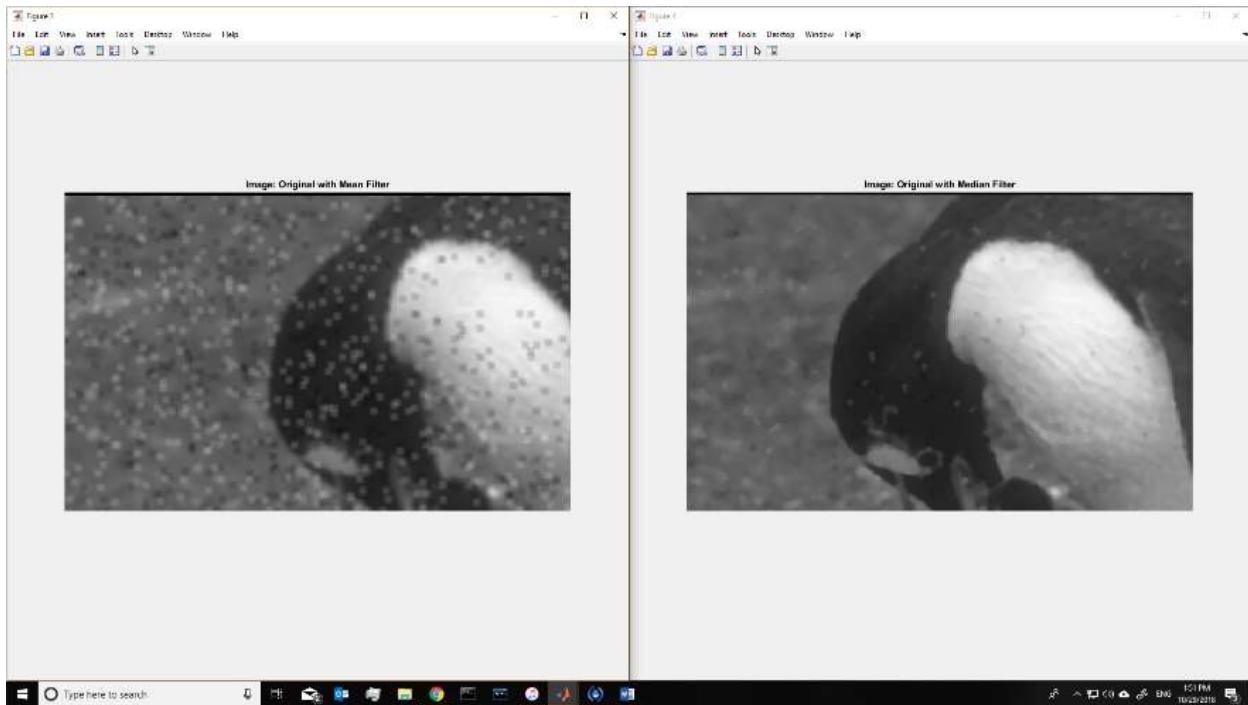
Figure 4: Median Filter



Figure 5: Display of all 4 Images in one Window



Mean Filtering vs Median Filtering:



Task 3: Object Recognition

Figure 1: Original Input Image

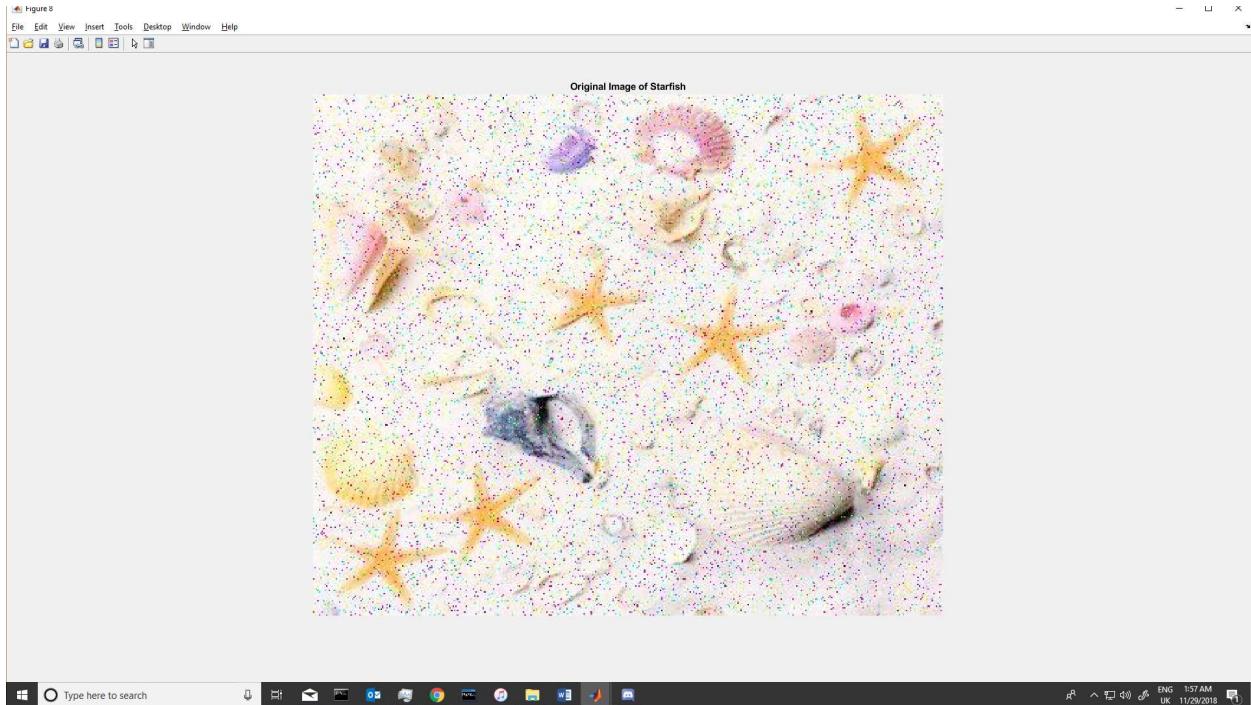


Figure 2: Grayscale Input Image

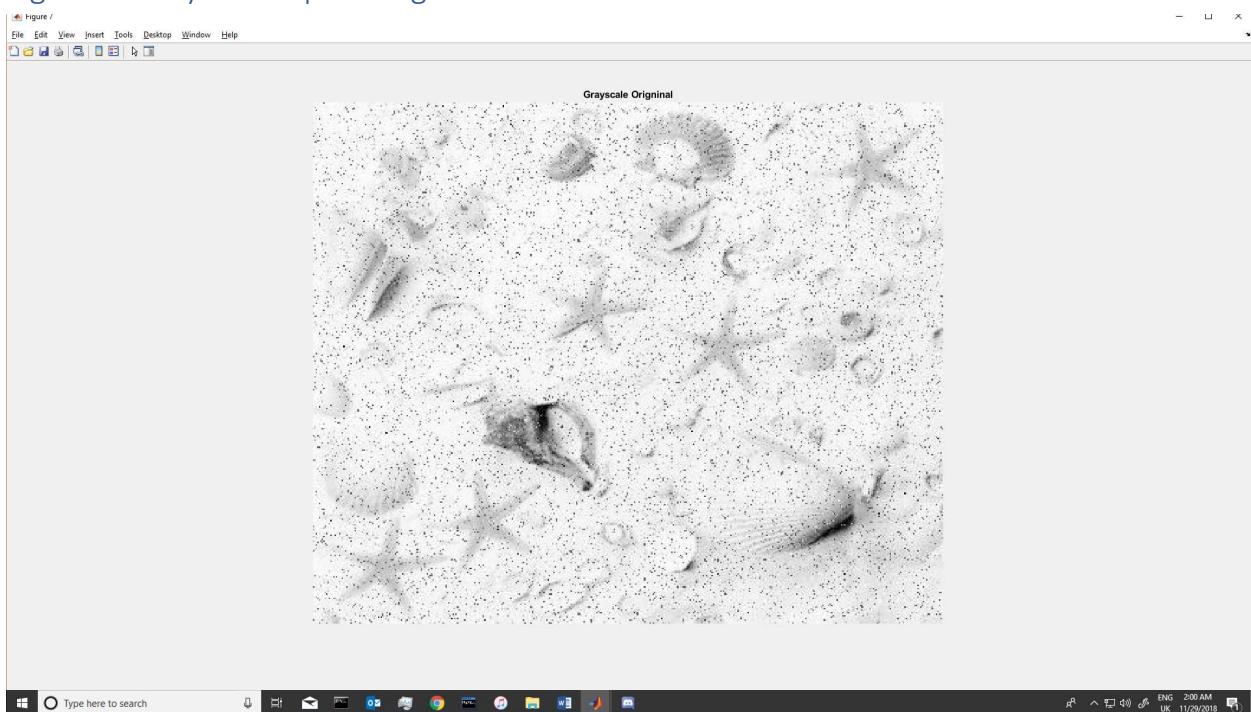


Figure 3: Mean Filter

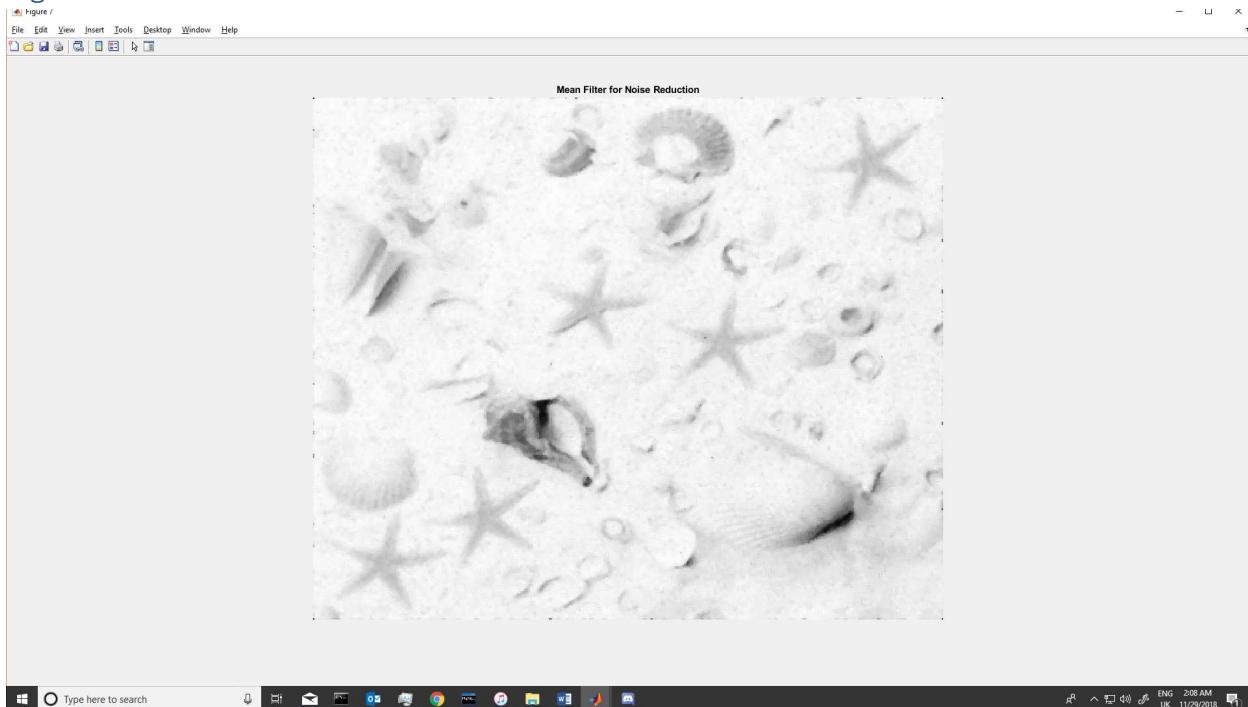


Figure 4: Sharpening

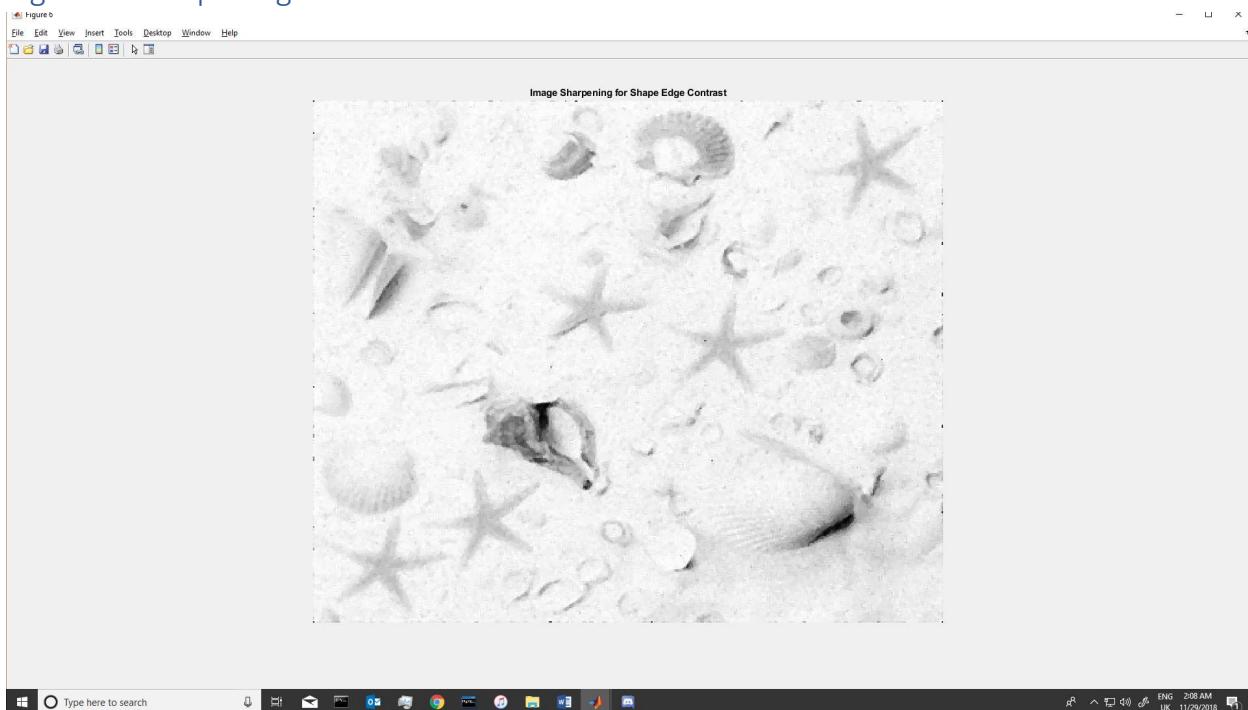


Figure 5: Conversion to Binary Using Manual Thresholding 0.910



Figure 6: Inverted Binary Image (Black Background)



Figure 7: Erosion of Binary Image

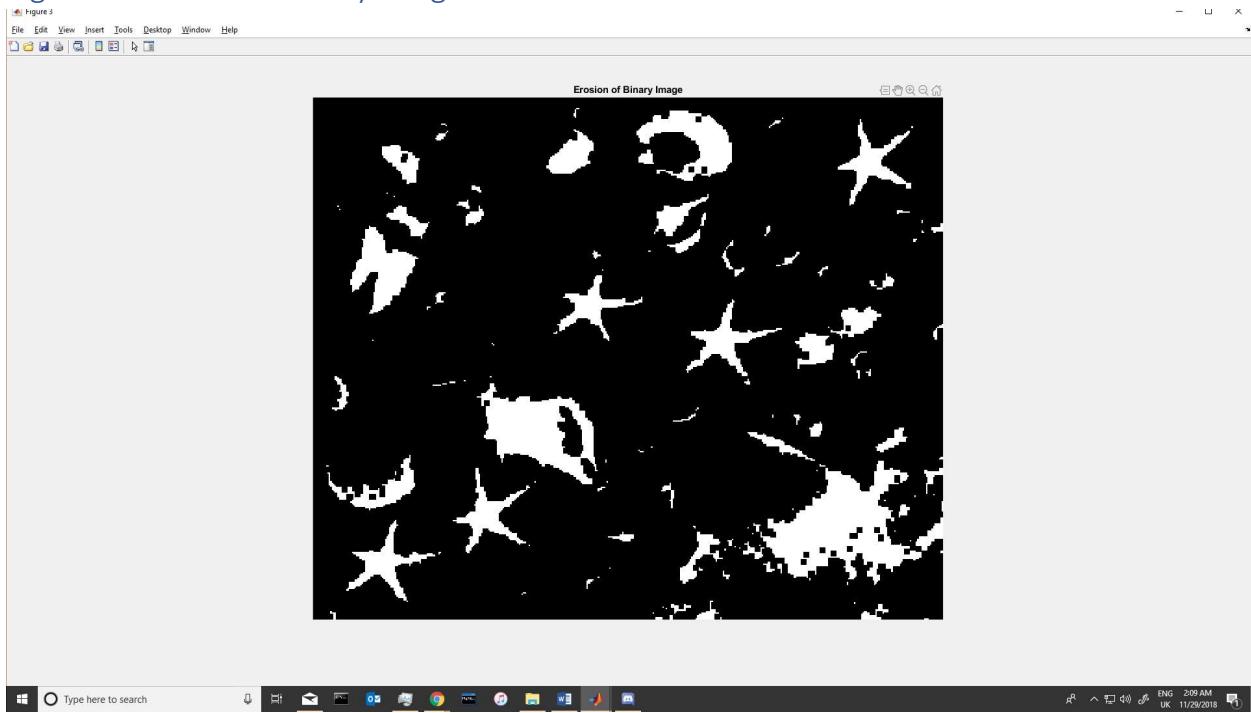


Figure 8: Dilation of Binary Image

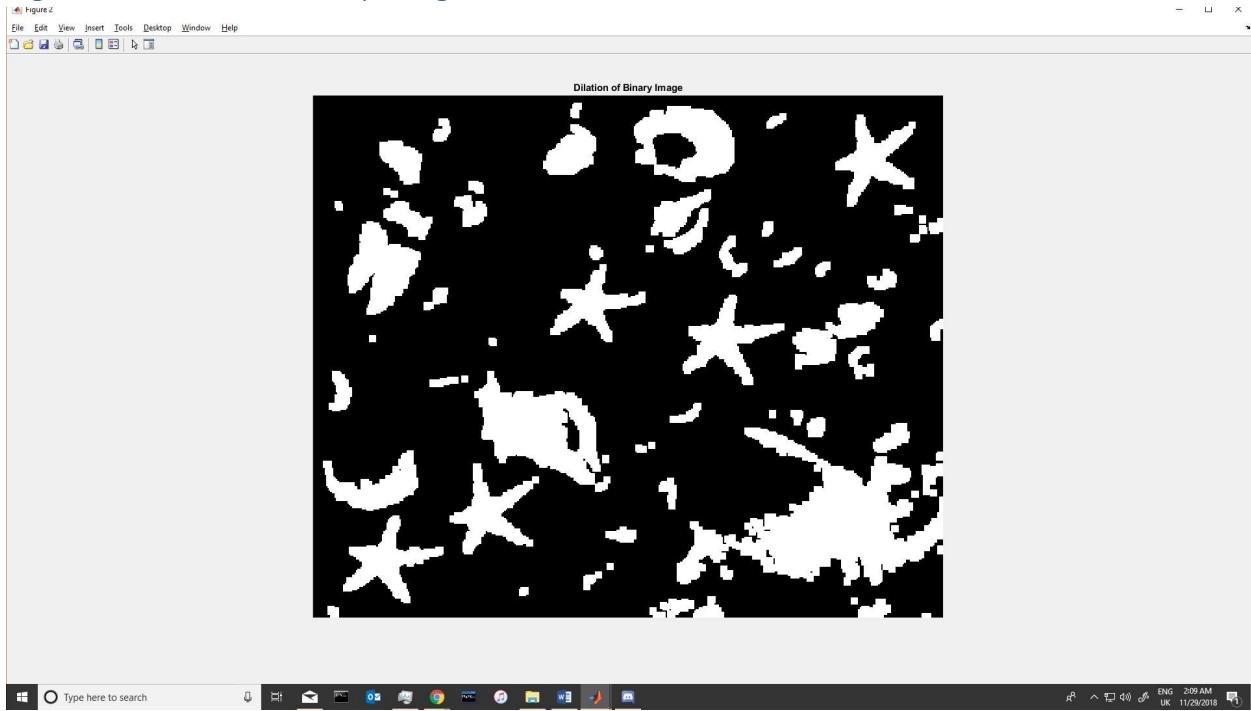


Figure 9: All Objects Skeletons Within The Image

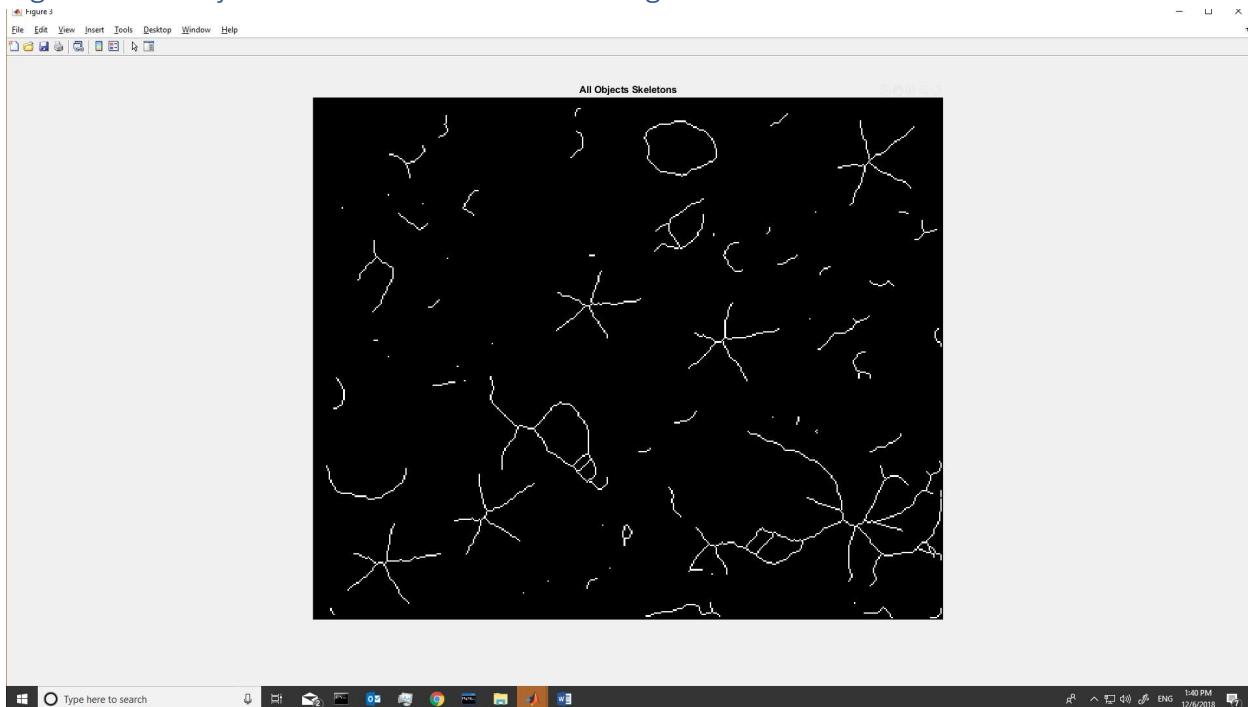


Figure 10: All Objects Displaying the Perimeter and skeletons



Figure 11: Starfish Recognition Using a Skeleton Structural Descriptor and Shape Factor



Task 4: Shape Description

Figure 1: Original Input Image

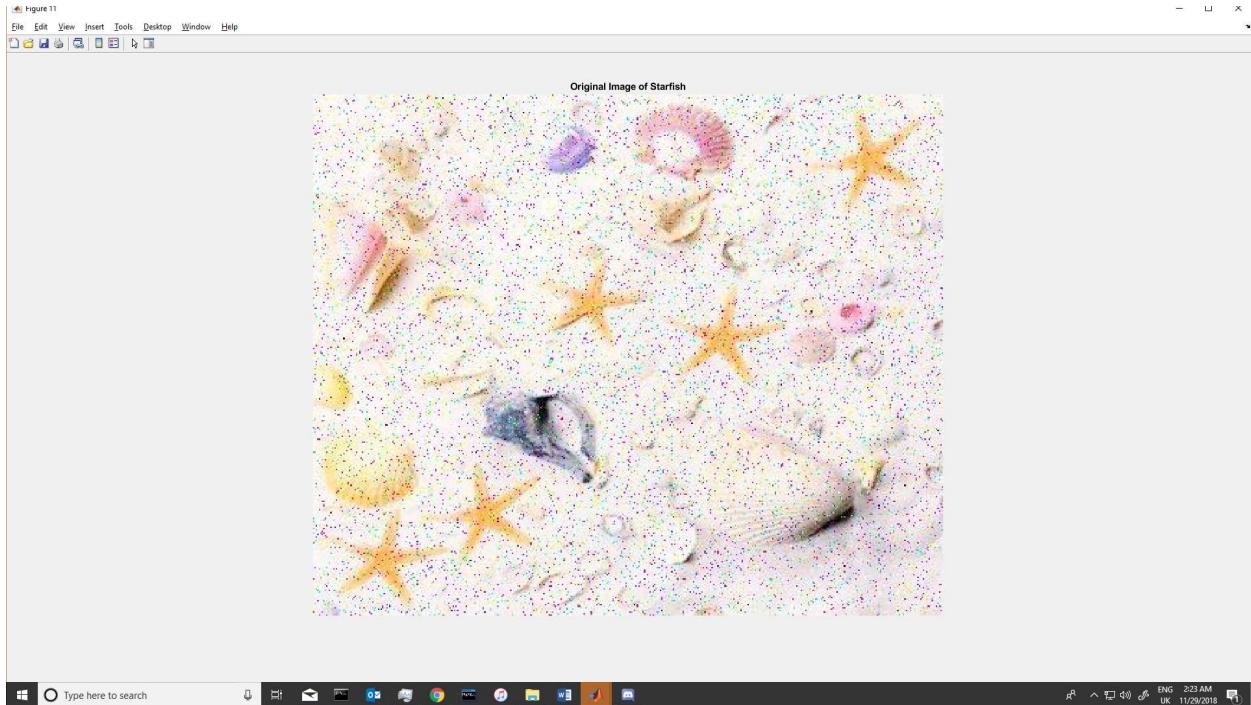


Figure 2: Grayscale of Input Image

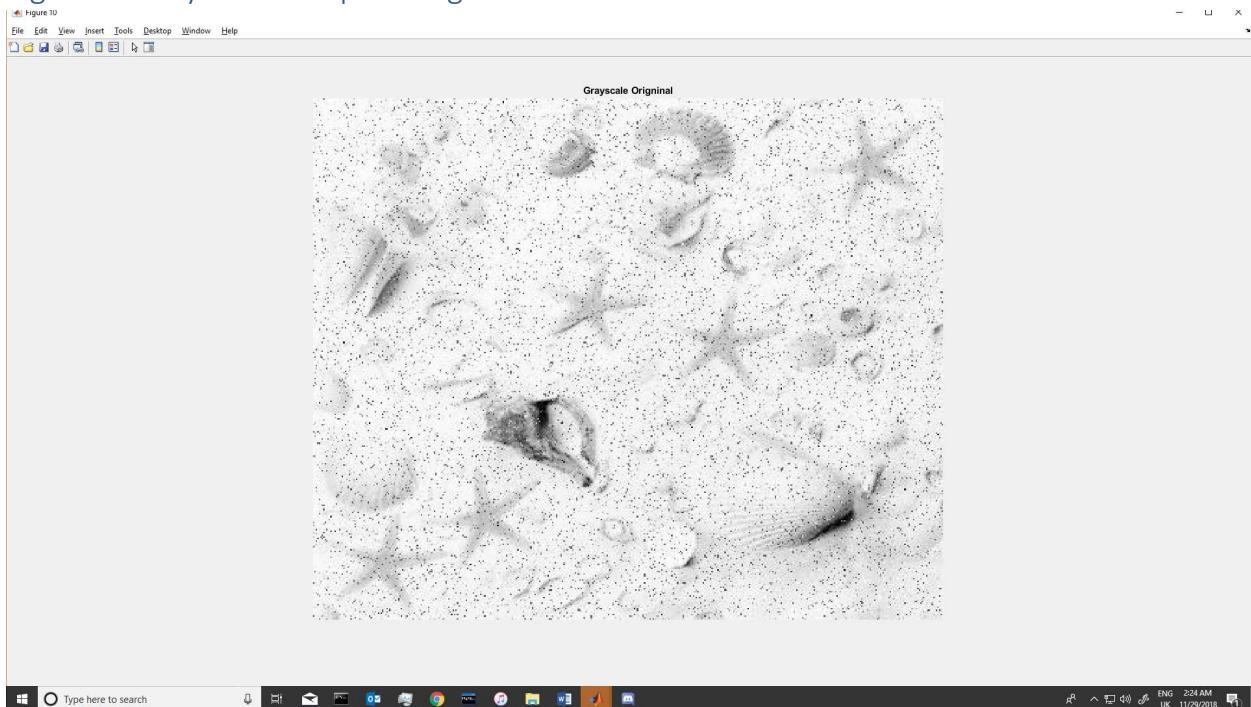


Figure 3: Mean Filter

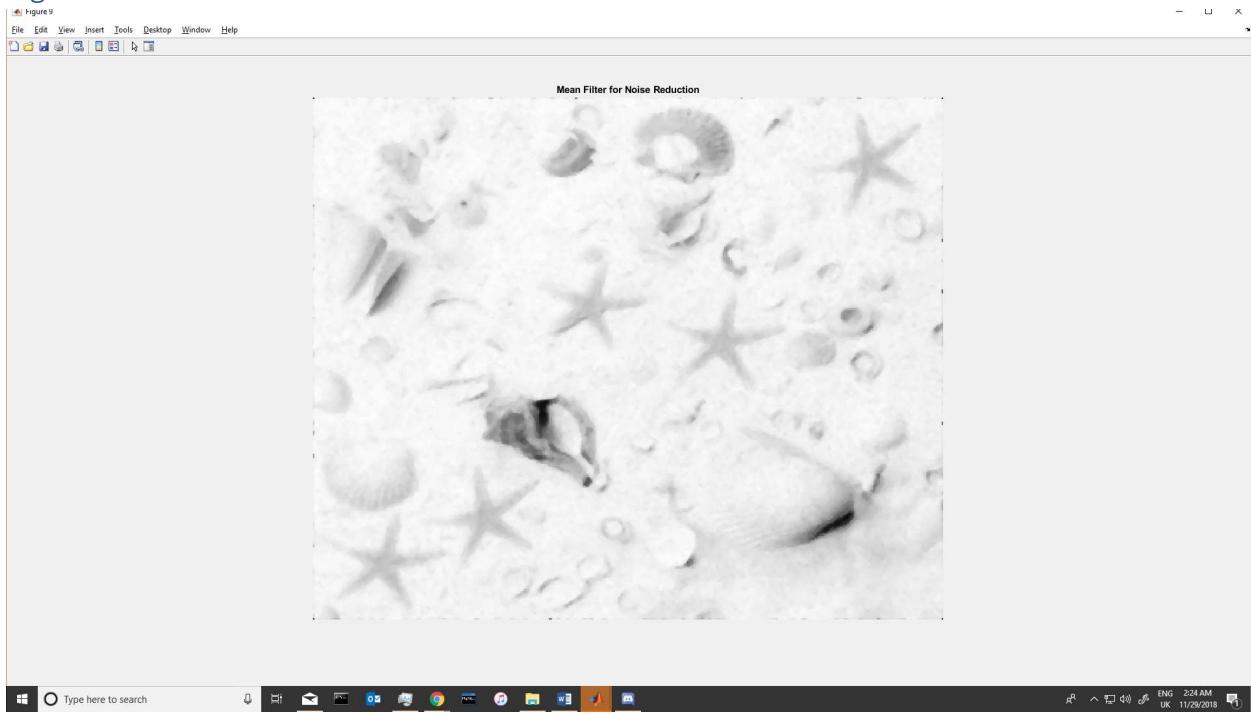


Figure 4: Sharpening

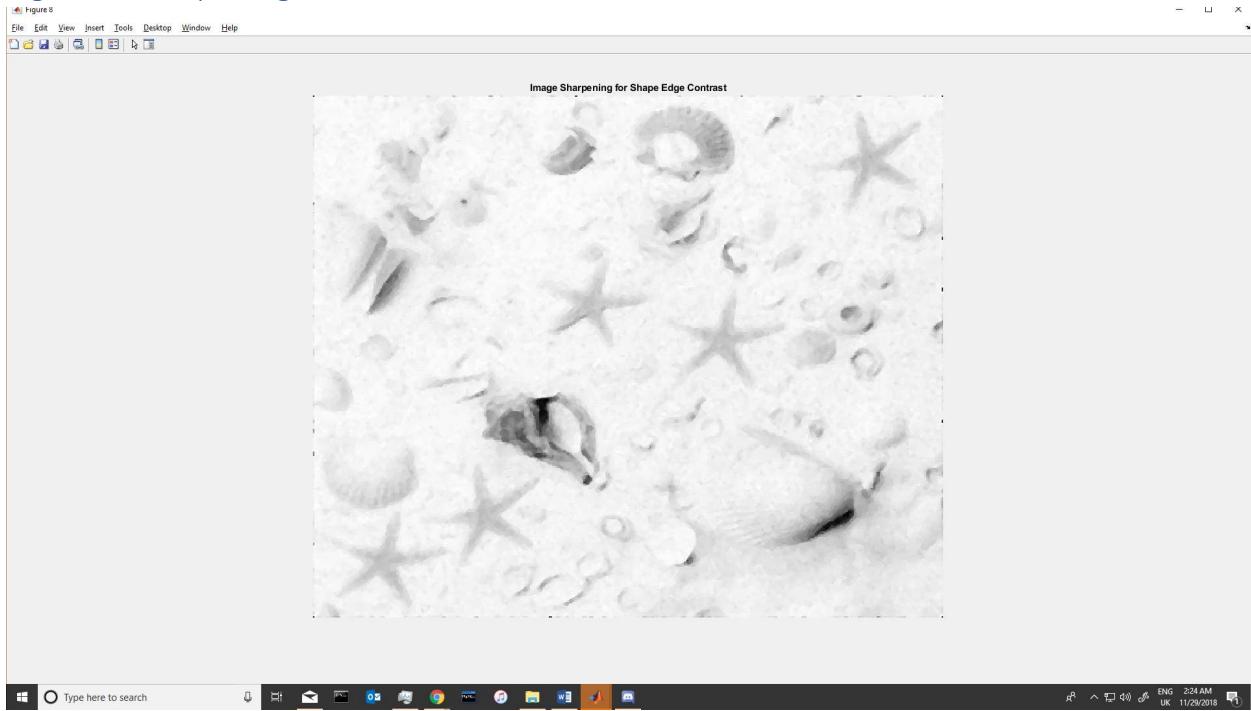


Figure 5: Conversion to Binary Using Manual Thresholding 0.910



Figure 6: Inverted Binary Image (Black Background)

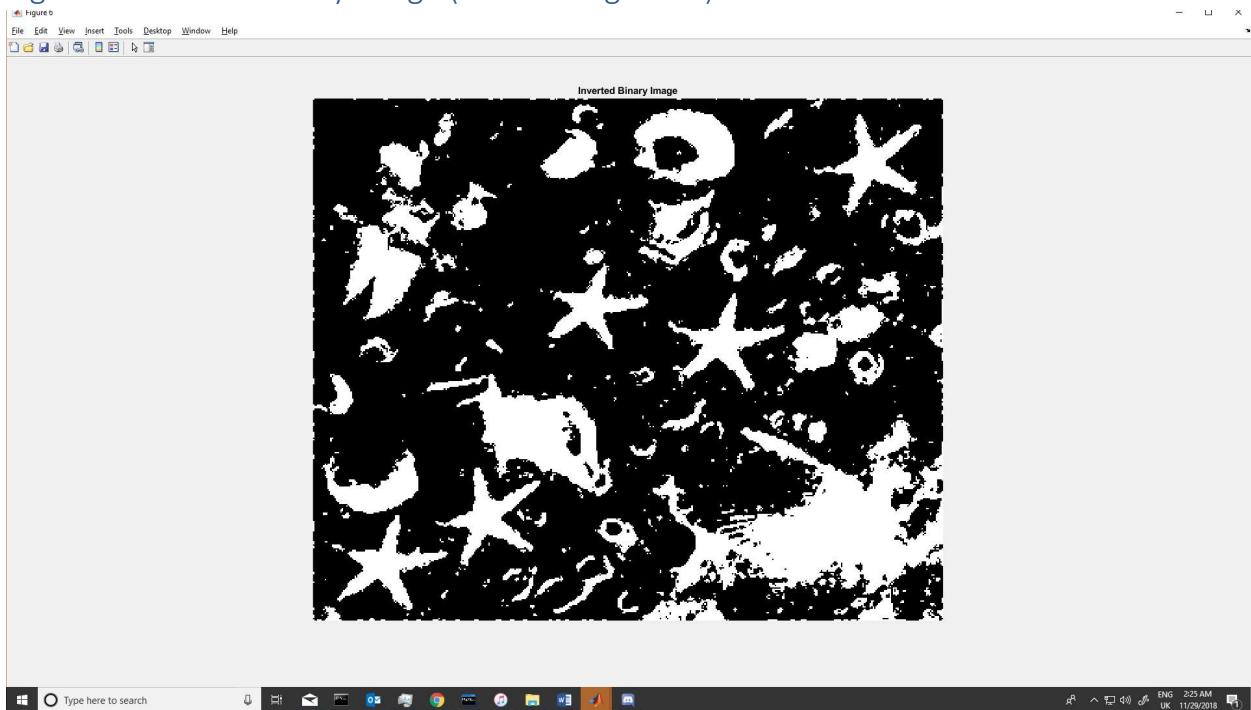


Figure 7: Erosion of Binary Image

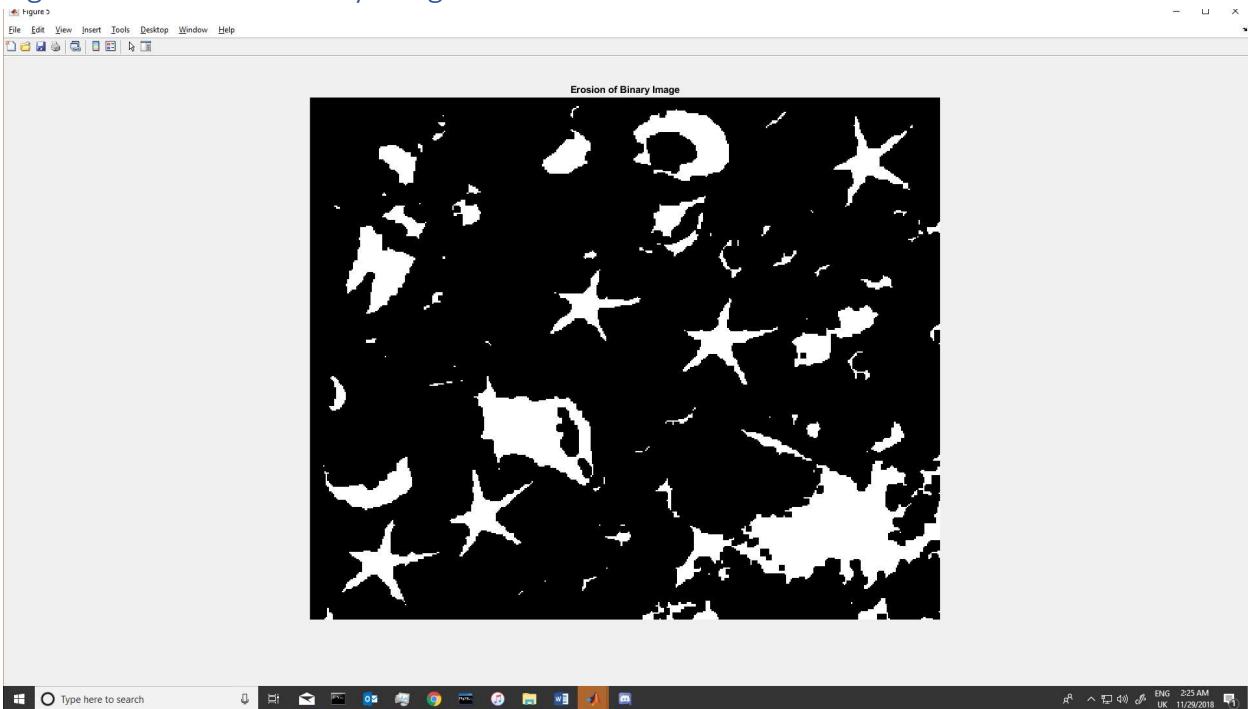


Figure 8: Dilation of Binary Image

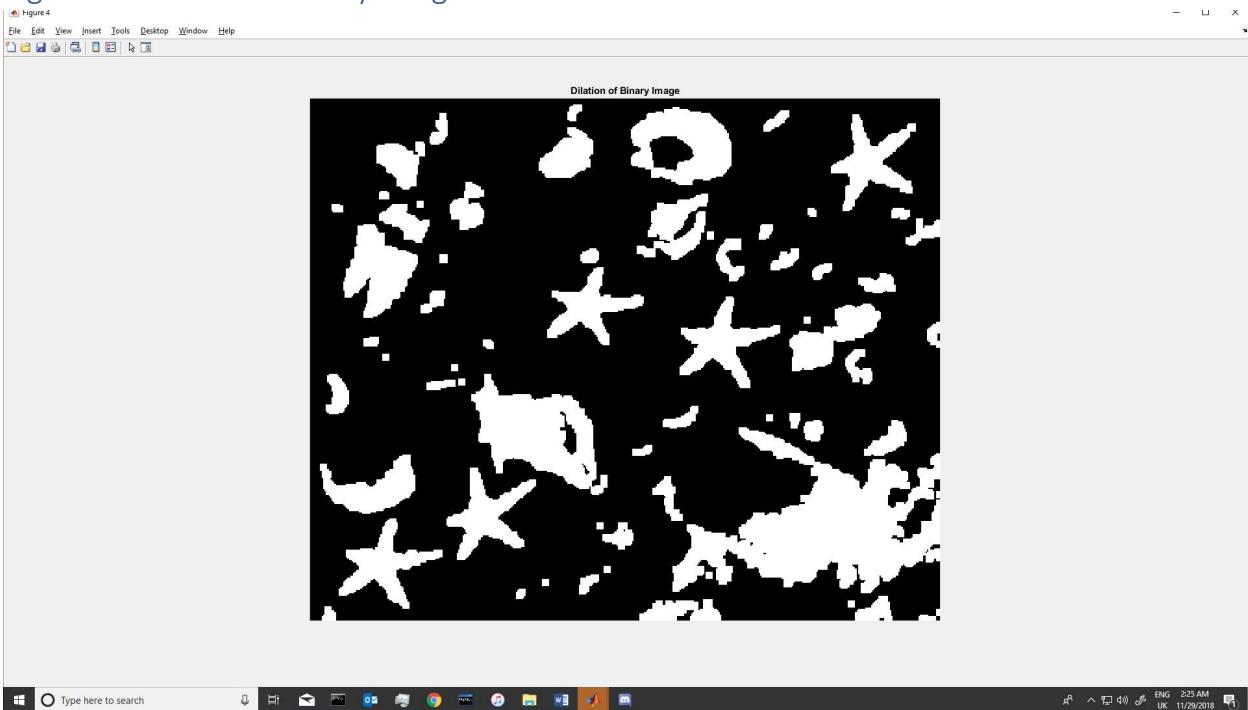


Figure 9: Starfish Recognition Using Shape Signatures and Graph Peak Analysis

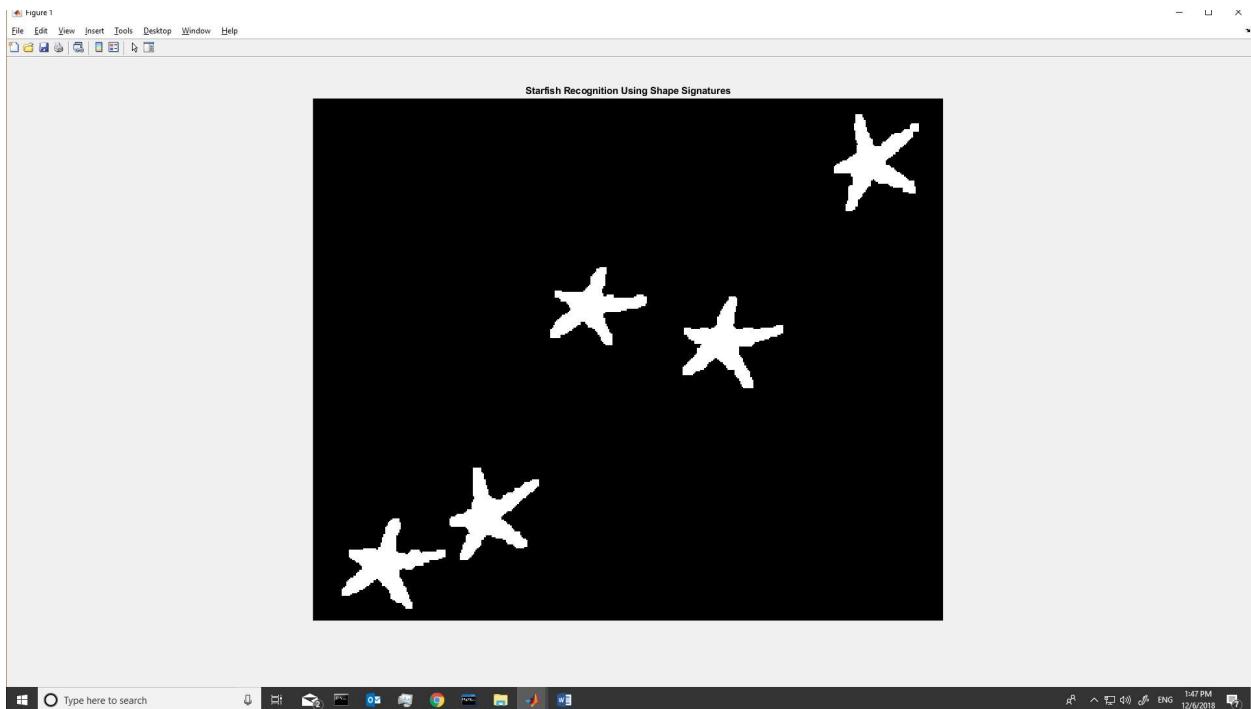


Figure 10: Peak Analysis for Objects (Starfish)

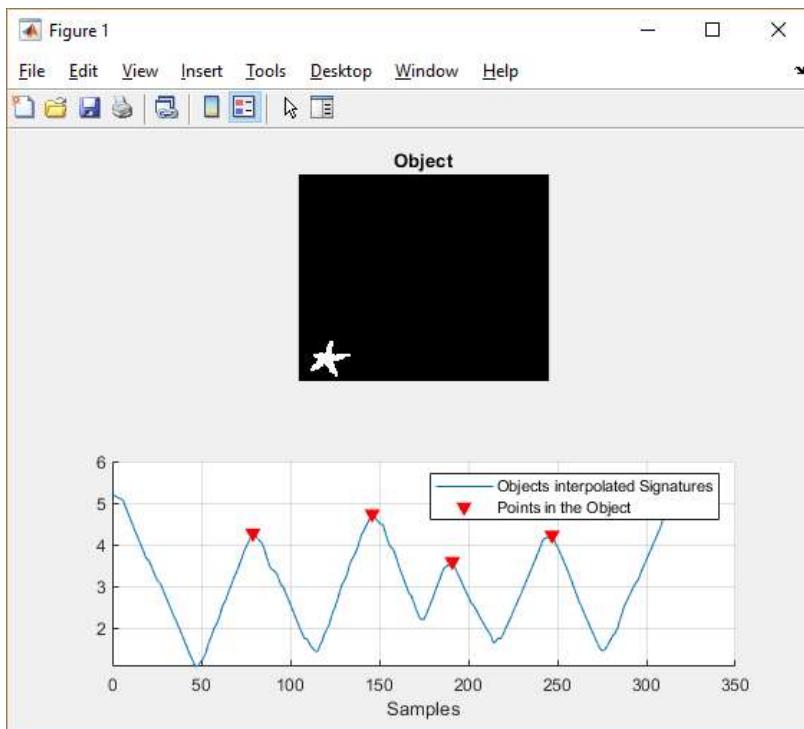


Figure 10: Peak Analysis for Objects (Non-Starfish)

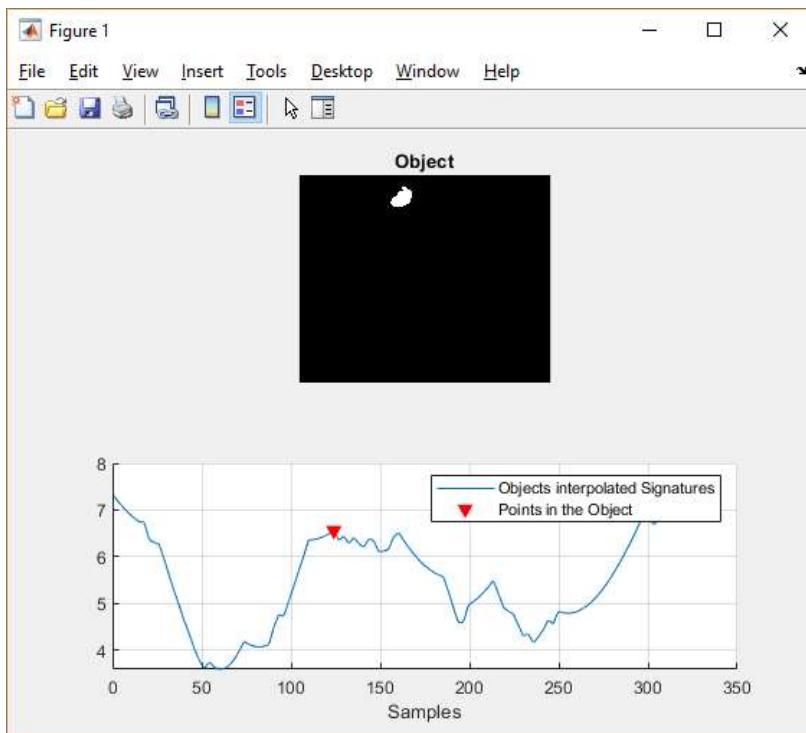


Figure 11: Comparison of Objects Using Sum Squared Distances

