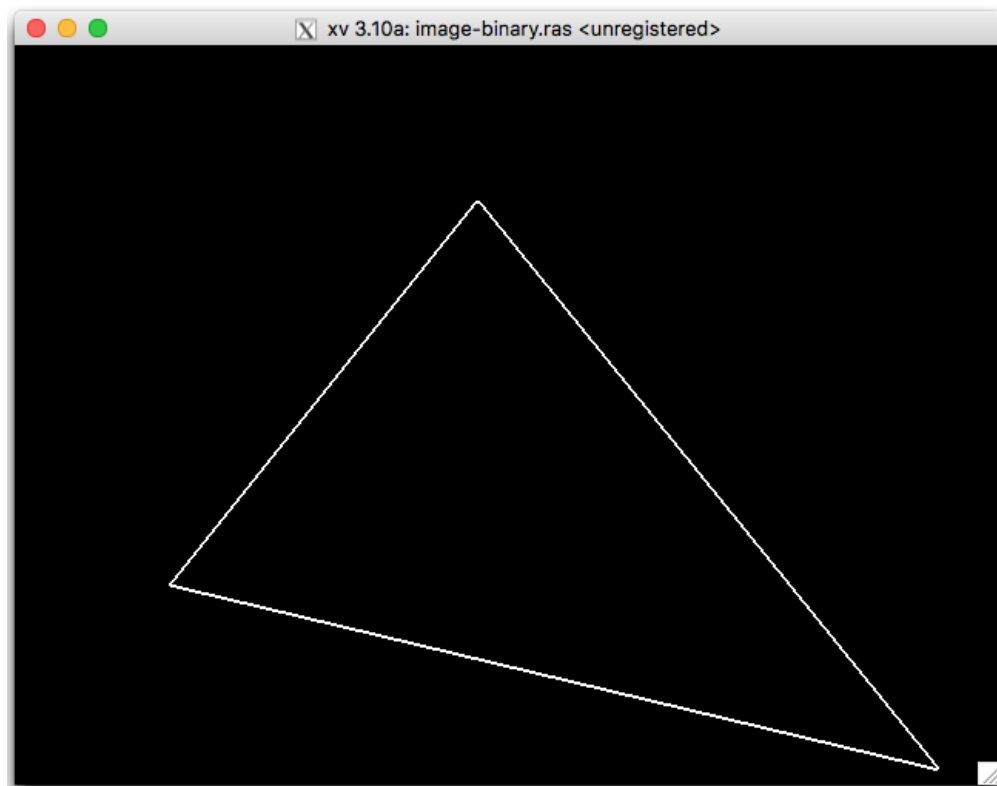# Introduction to Machine Vision
(EECS 101)
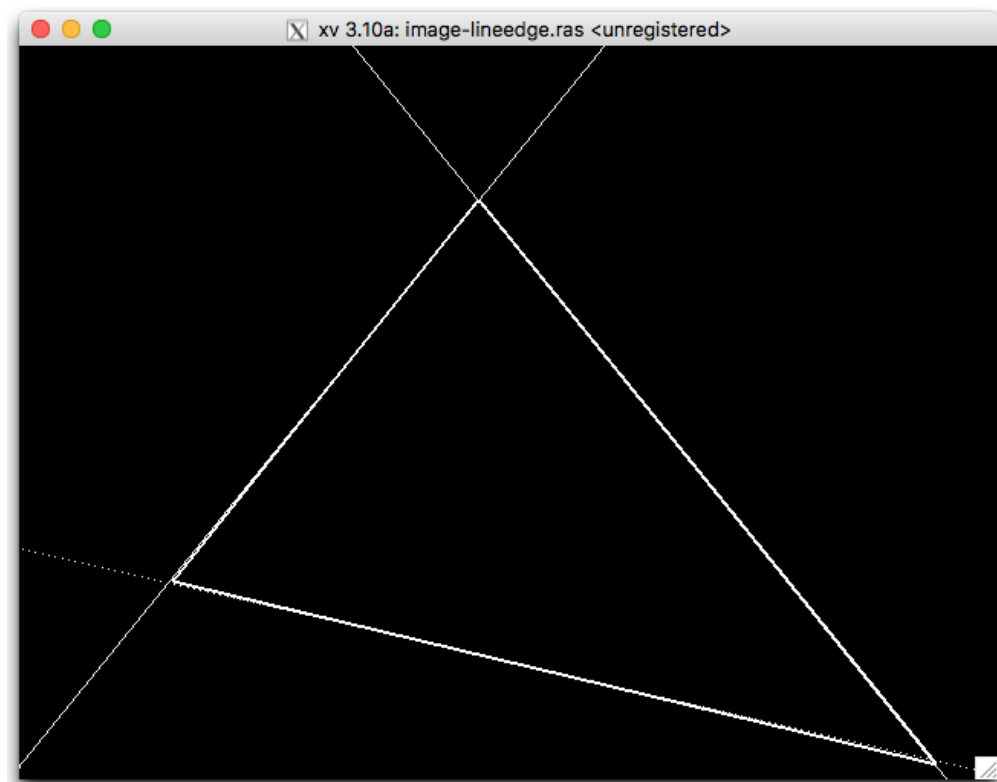
Homework #5

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Binary Image:

Line Edge Image:

The values for the lines are:

	line1	line2	line3
ρ:	170	-320	-297
θ:	39	77	141
Number of Votes:	475	247	206

My approach:
I used the same code as for the previous homework to find the Gc,Gy. and SGM in order to generate the binary image. I found the SGM threshold to be 100 which I used to generate the binary image.

After generating the binary image, I created a voting array. This is a two-dimensional array which stores θ and ρ. The size of the array was determine in that θ can be between 0 and 180 so the max size was set to 180. However, for ρ it is more tricky in that it can be a negative value. Therefore, since the smallest value ρ is -640 which is the size of the column (because column is greater than the width). I would have to add 640 to all ρ hence the size of the array for ρ has to be 2*COLUMNS which is 1280.

After, I looped through every pixel of the binary image and if the pixel value is 255, I would calculate θ and ρ and increment the voting array. Note, I added 640 to the ρ value to make sure that it would not be negative (hence out of bound of the array). Therefore, I would loop through the voting array and find the θ and ρ that had the most votes, which would correspond to one line. I would repeat the same to find the other two lines. Nevertheless, to make sure that it does not detect the same line, I reset the lines that has already been found and had a hough threshold of 20 to make sure that the lines that are close together would not be detected again.

Next since I already found the ρ and θ for the two lines, I had to subtract 640 from ρ because I added 640 before to make sure it would not go out of bound for the array. Then, I would loop through every row and calculate if a corresponding pixel satisfies the ρ and θ values for the line, and if they do I would set the pixel to 255, which in the end would generate the lines.